



# HACKANOVA 3.0

UNLEASHING THE AI SYNERGY

IDEA SUBMISSION TEMPLATE

# Team Member Details

Team Name	Code Omega			
Team Members >>	1 (Leader)	2	3	4
Name	Haadi Rakhanghi	Hatim Mullajiwala	Vedant Kambli	Mehek Jain
Institute Name	D.J Sanghvi College of Engineering	D.J Sanghvi College of Engineering	D.J Sanghvi College of Engineering	D.J Sanghvi College of Engineering
Email	haadirakhanghi@gmail.com	hatmsb11@gmail.com	kamblivedant50@gmail.com	mehekjain28@gmail.com

# Problem Statement

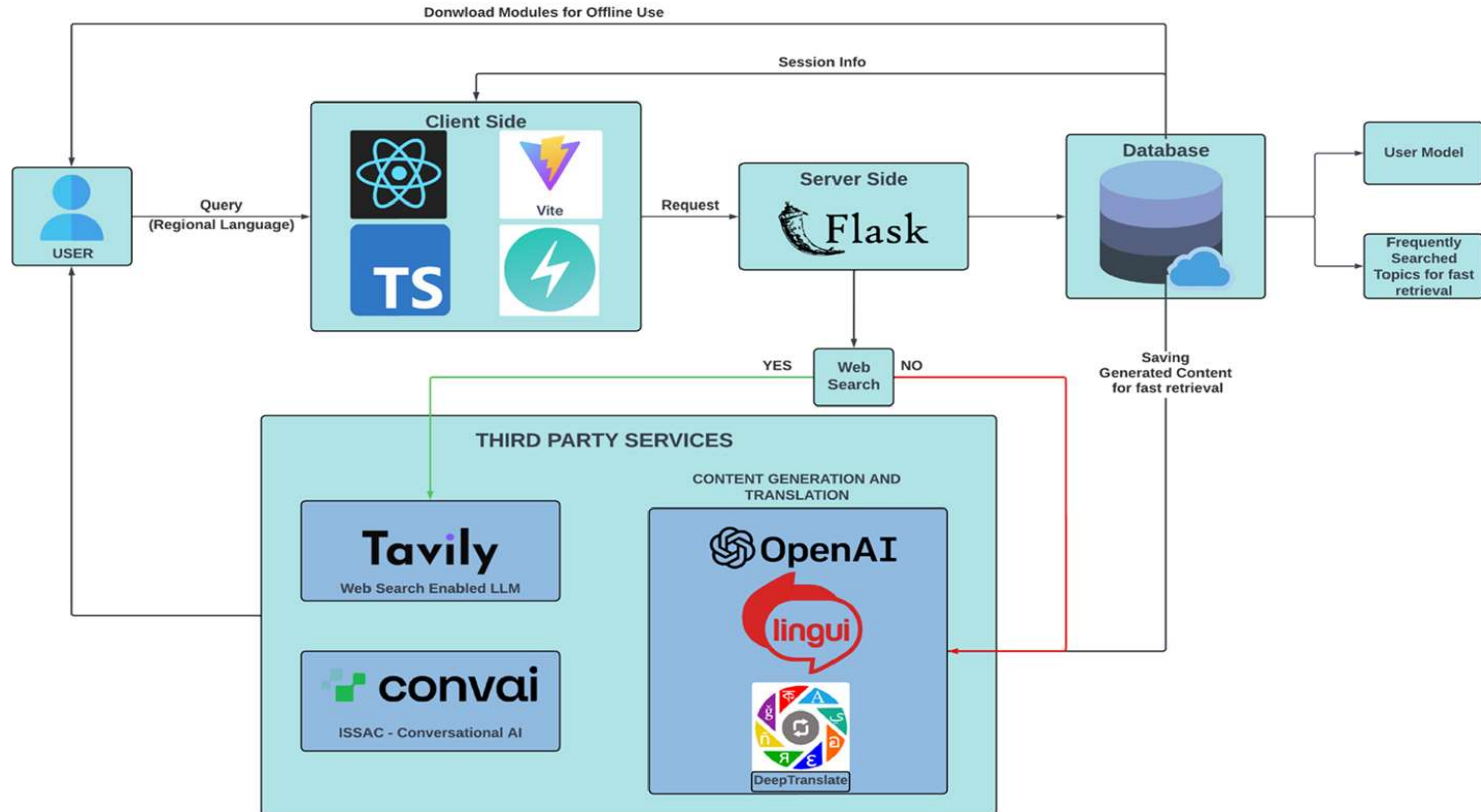
When considering the various obstacles encountered by students residing in remote regions, we duly recognize the substantial influence that language barriers exert on their capacity to access academic materials and understand online courses. The restricted accessibility of materials in the learners' mother tongue presents an obstacle to the standard of education as a whole. Simultaneously, we acknowledge the more extensive concerns that include obstacles related to infrastructure and accessibility, both of which hinder the effectiveness of online education endeavors and present technological obstacles for motivated students. Moreover, delays caused by the pandemic disrupt the learning process, causing students to experience setbacks and difficulties in regaining academic progress, thus exacerbating the educational disparity. Our dedication is to delivering all-encompassing solutions in the field of educational technology, with streamlining personalized content generation and making it available to everyone as a primary goal. This involves providing individualized learning trajectories to accommodate academic setbacks and extending assistance to the wider student body, specifically those who are facing difficulties in resuming their studies from distant locations.

# Idea/Approach

- The MindCraft project unfolds with the development of an educational website, meticulously crafted using React, TypeScript, and Chakra UI, empowered by state-of-the-art generative AI models like GPT-3.5-turbo-1106. The user journey begins on the Explore Page, where dynamic modules are generated based on user queries, creating a versatile learning space. Modules are meticulously structured in a hierarchical format – starting with basic and advanced modules. Upon user selection, the system utilizes a Generative AI model (GenAI) to dynamically generate sub-modules enriched with real-life applications and examples. These sub-modules are designed to offer a detailed and immersive understanding of the chosen topic, fostering an interactive and engaging learning experience. With features such as downloadable content, multilingual support, assessments, a web-search function, and interactive elements like the 3D educational chatbot ISSAC and a user-friendly virtual assistant, MindCraft stands as an innovative and user-centric educational platform, transcending traditional learning paradigms.



# Idea/Approach



# Tools/Items used

1. **React with Vite:** Vite selected for faster compilation in React development.
2. **Typescript:** TypeScript chosen for static typing, improving code quality.
3. **Chakra UI:** Chakra UI utilized for faster UI component development with inbuilt features.
4. **ConvAI (3D Chatbot):** For implementing 3D chatbot functionality.
5. **Axios:** Axios employed for simple and effective handling of HTTP requests.
6. **OpenAI :** Chosen for efficient integration of powerful language models.
7. **Flask:** Flask selected for server-side development due to its simplicity and flexibility.
8. **CORS:** CORS implemented to handle cross-origin requests, ensuring secure communication.
9. **Weasyprint:** Weasyprint chosen for generating PDFs due to ease of use and reliability.
10. **Deep-translator:** deep-translator chosen for language translation capabilities and wide range of options for translation.
11. **Tavily's Search API:** Tavily's Search API incorporated as a specialized search engine for AI agents (LLMs), delivering real-time, accurate, and factual results at speed.
12. **Langchain**
13. **SQLAlchemy:** To store the Data
14. **React-Speech-Recognition:** To perform speech-to-text and text-to-speech tasks
15. **Sentence Transformers:** To extract and match content for recommendation

# Use Cases

- 1. Self-paced Learning Journey :** Students and lifelong learners can embark on a self-paced learning journey by exploring modules generated by GPT3.5turbo1106 on the Explore Page. Dynamic module generation, real-life examples, and the text-to-speech feature cater to diverse learning preferences.
- 2. Accessibility for Visually Impaired:** Visually impaired individuals can access educational content effortlessly. Text-to-speech functionality provides audio support, making the content accessible to users with visual impairments.
- 3. Last-Minute Revisions:** Students preparing for exams can make use of the downloadable PDF feature for lastminute revisions. Users can download generated content in PDF format, offering a quick and convenient review resource.
- 4. Multilingual Learning:** Language learners and non-English speakers can engage with content in their preferred language. Multilingual support allows translation of modules based on user preferences.
- 5. Interactive Assessments:** Users can test their understanding through three distinct assessments: Theoretical Quiz, Application-based Quiz, and AI Conversational Test. AI-driven quizzes and conversational evaluations offer personalized assessments.

# Use Cases

6. **Staying Informed with Web Search** : Users seeking the latest information on a topic beyond the model's training data. The web search feature fetches Realtime data, keeping users updated on recent developments.
7. **Immersive Chatbot Interaction** : Students can interact with the 3D educational chatbot ISSAC for additional learning support. ISSAC engages users in conversations, answering queries and providing supplementary information.
8. **Personalized Recommendations** : Users can receive tailored course recommendations based on their interests and completed modules. The virtual assistant analyzes user data to suggest relevant courses, creating a personalized learning path.
9. **Trending Topics Exploration** : Professionals and enthusiasts can stay abreast of industry trends. Trending topics section highlights current subjects of interest, facilitating ongoing learning.
10. **Collaborative Learning Hub** : Users can contribute to the platform by creating and sharing custom educational modules. Collaborative learning allows users to curate content, fostering a dynamic and evolving educational community.



# Potential Problems which could be Faced

1. The speed of sub-module generation might be slow based on the Large Language Model chosen. Parallelizing the sub-module generation can help to overcome this problem.
2. Generating the same module through an LLM again can result in a different response, thereby leading to inconsistency. Storing new topics in a sqlite database can help to solve this problem. This can also save the cost for making API calls.
3. Insufficient content on web-search generated modules