Beijing-Dublin International College

Project Proposal: Prometheus.EDU

Group 2: Mount Olympus

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Executive Summary

- **Introduction**: **Prometheus.EDU** is a comprehensive online education platform designed to provide equitable learning opportunities for underprivileged or restricted communities. Commissioned by the charity NGO **Agape**, the platform includes an online course service and a community forum, both of which facilitate learning, collaboration, and direct support.
- **Customer**: **Agape**, a global charity non-governmental organization focused on improving access to education in underserved regions, is our primary customer. Agape seeks an intuitive, scalable platform that can deliver high-quality educational resources and interactive learning tools to learners who may otherwise be unable to access formal schooling.
- **Products and Services**: **Prometheus.EDU** three key components: *NousTube*, *MetisHub*, and *AthenaTutor*. *NousTube* is an online video course service where users can watch educational content, take notes, and keep track of their progress. *MetisHub* is a discussion forum that allows learners to ask questions about course material, engage with peers, and seek assistance from participating NGOs if they face obstacles in their studies. *AthenaTutor* is an integrated Retrieval-Augmented Generation (RAG) chatbot within MetisHub that answers learners' questions by referencing the available course materials.
- **Key Technologies**: The platform is built using `React` and `Next.js` for the frontend, `Flask` for the backend, `PostgreSQL` for database interactions, and `LangChain` for the AI chatbot.

1 Problem Statement

Despite ongoing global efforts, many young people still face significant barriers to quality education—ranging from geographical restrictions and gender-based prohibitions to poverty and inadequate local infrastructure. **Agape**, in pursuit of its mission to deliver educational equity, has discovered that existing platforms either do not cater to the specific constraints of these learners or lack the interactive support and guidance necessary for sustained learning success.

Consequently, Agape needs a versatile yet user-friendly solution that not only offers structured course content but also provides real-time support from both educators and an AI-based assistant. This platform must be designed to accommodate various limitations in internet connectivity and device usage, ensuring inclusivity and effectiveness for learners from diverse backgrounds.

2 Proposed Solution

MountOlympus Software Company will develop **Prometheus.EDU**, a unified learning platform combining video courses, peer interaction, and AI-powered guidance. **Prometheus.EDU** will contain the following functionalities that address Agape's needs:

- **Structured Learning via NousTube**: Educational videos and lectures will be curated and hosted on the a module called *NousTube*, with features for taking notes and tracking course completion. The user-friendly interface ensures compatibility with mobile devices and low-bandwidth environments.
- **Community Support through MetisHub**: *MetisHub* will serve as the primary forum for discussions, where learners can post questions, exchange ideas, and receive timely assistance. Additionally, they can reach out directly to partnering NGOs for help regarding study-related hurdles, such as

financial constraints or access to learning materials.

- **AI-Powered Assistance with AthenaTutor**: Leveraging RAG techniques, *AthenaTutor* will reference approved course content to provide quick and accurate answers to learners' questions. This minimizes the need for constant human intervention while maintaining consistent, fact-checked responses.

Through **Prometheus.EDU**, **MountOlympus** will deliver an end-to-end educational ecosystem that breaks barriers to access, fosters community collaboration, and leverages cutting-edge AI to support learners across the globe.

3 Technical Approach

This project uses `React` and `Next.js` for the client side, allowing us to create a responsive, modern web application with server-side rendering and search engine optimizaiton. The backend is built with `Flask`, chosen for its simplicity and flexibility. Both frontend and backend are designed to work together through a clear API structure, ensuring smooth data flow and user interactions.

Deployment is automated through GitHub Actions. Pushing changes to the main branch triggers a pipeline that runs tests, builds the application, and deploys it to the UCD-provided virtual machine. `Flask` runs behind a WSGI server like `Gunicorn`, and `Nginx` handles reverse proxying to route traffic effectively.

Testing involves both unit and integration tests. `Jest` and `React Testing Library` handle frontend unit tests, while `pytest` and `unittest` cover the backend. Integration tests are performed with tools like `Cypress`, simulating user scenarios end-to-end. CI/CD processes ensure that all tests are run before deployment. Code coverage and performance metrics, such as API response times, are tracked to maintain application quality and reliability.

4 Ethics, Bias, Social Impact, SDGs & Privacy Protection

4.1 Ethics

We foster a high standard of professional integrity by creating regionally relevant learning materials and transparent user guidelines. Our platform emphasizes respectful communication and responsible conduct, ensuring that educational resources and community interactions align with core ethical values.

4.2 Bias

To mitigate bias, we use balanced, diverse datasets and RAG systems that utilizing credible, vetted sources for constructing the knowledge base. This approach helps minimize skewed outputs and ensures that learners receive fact-based information devoid of prejudiced perspectives.

4.3 Social Impact

By prioritizing equitable access to quality education, our platform helps expand opportunities for underserved communities. Students benefit from supportive online forums and real-time AI assistance, which can lead to improved career prospects, heightened social mobility, and stronger local economies.

4.4 UN Sustainable Development Goals (SDGs)

Our project aligns with several UN Sustainable Development Goals (SDGs), including:

- SDG 4 (Quality Education): The project provides reliable, high-quality educational content to learners regardless of their geographic or socio-economic constraints

- SDG 5 (Gender Equality): The project aims to include and empowering girls and women, creating an environment where they can learn free from cultural or systemic limitations
- SDG 10 (Reduced Inequalities): The project is dedicated to help level the playing field for individuals who lack traditional access to formal education

4.5 Privacy Protection

We implement robust encryption, secure authentication, and strict data governance policies. These measures protect personal information, maintain user trust, and ensure compliance with global privacy regulations.

5 Team Qualifications

MountOlympus Software Company is a team of highly skilled and motivated software engineers drawn from different regions of the country, reflecting a blend of cultural backgrounds and gender diversity. This inclusive composition broadens our perspectives when designing and building software, enabling us to address a variety of user needs more effectively. We are dedicated to delivering high-quality solutions across domains such as web development, artificial intelligence, and user experience design. By uniting our distinct insights and expertise, we are committed to developing innovative and impactful software solutions that tackle real-world challenges and create meaningful social change.

The core technical team of MountOlympus Software Company is listed below (in alphabetical order):

Team Members

- **Boyuan Zhang** *(Backend Engineer & Lead Testing Engineer)*: Boyuan is an experienced backend developer with hands-on involvement in real-world projects. His curiosity and passion for emerging technologies continually expand his skill set.
- **Keru Cai** *(Frontend Engineer & UX/UI Designer)*: Keru is a frontend engineer specializing with a keen eye for visual design and user experience. Her creative flair and design acumen allow her to craft intuitive interfaces that enhance user engagement.
- **Linyu Zhang** *(Lead Frontend Engineer)*: Linyu is a proficient frontend web developer that familiar with cutting-edge web technologies. As a highly motivated problem-solver, he consistently delivers effective solutions in a timely manner.
- **Sichen Li** *(Full-stack Engineer & Lead AI Engineer)*: Sichen has comprehensive experience in both frontend and backend development. He has also worked extensively with large language models and related AI technologies, enabling him to offer innovative perspectives and solutions.
- **Yuxin Tian** *(Frontend Engineer & Team Manager)*: Yuxin is a skilled frontend developer with extensive industry experience. She excels at building web apps using comprehensive web technologies, consistently providing intelligent and dependable solutions. As Team Manager, she ensures smooth coordination and timely delivery of project milestones.
- **Ziqin Ma** *(Lead Backend Engineer)*: Ziqin is a qualified backend web developer that familiar with multiple backend development paradigm. He takes pride in writing robust code and delivering solutions that are both reliable and efficient.