**Project Title:** YANKA – AI-Powered Multilingual Educational Assistant

**Team Members:** Aayush Bharti, Advikaa Kapil, Dayanna Bay Esquer, Gursparsh Singh Sodhi, Ang Li

# Project Description & Objectives

## Project Description

Provide a comprehensive description of the project, detailing its purpose, significance, and the problems it aims to solve. This section should offer a clear understanding of what the project entails and its overall vision.

- **Purpose**: Yanka is designed to deliver quality education by providing an intelligent, multilingual, and AI-powered education assistant. It is designed to convert content into dynamic, engaging, and personalised content with a custom dashboard, avatar, and user support system. Yanka serves to enable learned and underserved, and multilingual communities to access lessons anytime, anywhere, with offline-first capabilities for low-bandwidth regions. The platform also gives flexibility and control to educators and guardians to create AI-enhanced content efficiently while supporting institutions and organizations with learning analytics and State-of-the-Art integration.

- **Significance**: Yanka addressed the need for growing global personalisation and technology drive education. By integrating State-of-the-Art AI tools, the platform goes beyond traditional e-learning platforms by offering an ever-adapting and highly personalised content while being aware of the underserved and cultural environments. Yanak serves to offer:
    - **Widespread Educational Access:** Reaching students in remote areas with offline-first capabilities
    - **Empowering educators:** A customizable dashboard that allows educators to view the performances of students and generate content to show in classrooms.
    - **Data-Driven Decisions:** Providing content based on the user's ethnicity, choice, and progress tracking ability
    - **Supporting Multilingual and Inclusive Learning:** Offering lessons in the user's native tongue and accommodating users with disabilities.

- **Problems Addressed**: Yanka is specifically designed to solve challenges in the current global education system. It aims to resolve the limited access to quality education in rural or underserved areas that lack trained teachers and high-quality content. Moreover, existing learning platforms often support only a few languages, leaving minority speakers behind. Yanka tackles this obstacle by using powerful LLMs capable of conversing in any language. Traditional static content fails to consider that every learner has their own pace and type of content they find engaging. The platform is capable of generating personalised content for every user. Additionally, teachers and

institutions spend several weeks to a year creating content for classes, whereas Yanka is capable of generating high-quality videos in a significantly lesser timeframe.

### Primary Objectives

Outline the primary objectives of the project using the SMART criteria (Specific, Measurable, Achievable, Relevant, Time-bound).

- **Objective 1**:
  By the end of the semester, Sprint 11, the team will have completed a functional YANKA platform prototype. Within it would include an AI chatbot, AI generated educational video functionality, and customizable AI avatar. This will be integrated into both web and mobile interfaces, and should include three main workflows; being content generation, the learner interaction, and tracking a user's progress.

- **Objective 2**:
  By the end of the semester, Sprint 11, the team will have built a fully working backend for the YANKA platform. The database must support both the mobile and web platforms of the application, and functionalities for all types of users. An initial design of the database must be completed by Spring 6 and implemented by Sprint 7, and subsequent functionalities must be completely in sync with and support corresponding UI features in each sprint.

- **Objective 3**:

  By the end of the semester, Sprint 11, the team will provide comprehensive technical documentation which details the database architecture, API usage, how to set up the environment, and instructions for deployment. This will be useful for the sponsor so that they can continue to maintain and even extend the YANKA platform independently, or if they wish to work with others in future, after the completion of the project.

# Reviewed Product Backlog Items (PBIs)/EPICS

### EPICS

List the prioritized features, enhancements, and fixes required to deliver a successful project.

- **EPIC 1**: MVPs for the Web and Mobile Platform – Frontend
  - Priority: High
  - Time Estimate: 3 Sprint Cycles
  - Tasks:
    - Review, refine, and finalize the Yanka website for production readiness.
    - Design and implement a mobile friendly MVP that aligns visually and functionally with the web platform.

        - Develop responsive and mobile optimized user authentication flows (login, signup, language selection, onboarding etc.).
        - Develop mobile dashboard for learners and educators, including progress and analytics view.
        - Develop mobile interface for the AI chatbot and support page.
        - Develop mobile interface for Avatar creation and AI video lesson generation.
        - Develop mobile interface for course browsing and marketplace features.
        - Implement accessibility, multilingual UI support, and low-bandwidth UX considerations across all screens.
        - Perform cross-device testing and polish to ensure consistency between and mobile experiences.

- **EPIC 2:** MVP's for the web and mobile platform - Basic Backend
    - Priority: High (high priority as basic features of the backend support core functionalities of the product)
    - Time Estimate: 2-3 Sprint Cycles
    - Tasks:
        - Finalize the database design for basic user features (login, signup, etc.)
        - Develop initial states of the database in Postgres, Docker, and AWS
        - Design database interactions required for basic user features
        - Implement database interactions for basic user features
        - Connect database interactions to frontend interface

- **EPIC 3**: MVP's for the web and mobile platform - Intermediate Backend
    - Priority: Medium (lower priority as basic backend is absolutely necessary for the MVP, whereas more advanced features can be shown through a static frontend page without largely impacting the core functionalities of the product)
    - Time Estimate: 1-2 Sprint Cycles after basic backend is finished
    - Tasks
        - Review and finalize basic database
        - Update database design to support analytics and course marketplace
        - Design database interactions for analytics and course marketplace
        - Implement new database interactions in the backend
        - Connect backend database interactions to frontend interface

- **EPIC 4:** AI interactions and Chatbot support
    - Priority: Medium - High (includes some crucial aspects of the core functionalities of the product, but is not absolutely necessary for an MVP and some features can be substituted temporarily with a static frontend design)
    - Time Estimate: 4 Sprint Cycles
    - Tasks
        - Secure API tokens and AI models for the product
        - Connect AI API to chatbot support
        - Connect AI API to frontend and backend for video generation

        - Connect AI API to frontend and backend for avatar creation
        - Connect AI API to frontend and backend for multilingual support

# Semester Plan

- Create a timeline for the semester, breaking down user stories into sprint cycles.
    - Sprint 6
        - Database, Docker, AWS documentation
        - Mobile Application Architecture & UX Planning
        - Initial Mobile UI Framework & Navigation Setup
        - AI Support Initial Development
        - AI Video Generator Initial Development
        - Finalize Version 1 of Database Design
    - Sprint 7
        - AI Support and Chatbot Development
        - AI Video Generator Development
        - AI Avatar Development
        - Core Mobile Application UI Development (Authentication, Navigation, Dashboards)
        - Mobile-Responsive UI Alignment with Web Platform
        - Database Connection to Mobile and Web
    - Sprint 8
        - API Usage Documentation
        - Final AI Support and Chatbot Development
        - Final AI Video Generator Development
        - Final AI Avatar Development
        - Mobile AI Interaction UX (Chat, Video Generation, Error & Loading States)
        - Initial LMS Integration into Application
    - Sprint 9
        - Environment/Dependencies for Setup Documentation
        - Multilingual Support Development
        - Learning Analytics Dashboard Development
        - Finalize LMS Integration into Application
        - Finalize Mobile and Web UI/UX, Accessibility, and Performance Optimization
        - Cross-Device Testing for Mobile and Web
    - Sprint 10
        - Initial Development of Gamified Learning
        - Initial Development of One-click video updating system
        - Finalize Learning Analytics Dashboard
        - Finalize Multilingual Support Development
        - Create Poster for Demo
    - Sprint 11
        - Finalize Database Documentation

- Finalize Environment Documentation
- Development of Gamified Learning
- Development of One-click video updating system
- Implement mobile app installability (PWA Readiness)
- Create Handover documents