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Team Name: Y2Know

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Problem Statement Title: Smart Classroom

Problem Statement Domain: EdTech & AIML



Problem Statement Details

Problem Statement:

- The current educational landscape grapples with several inefficiencies, including manual attendance tracking, lack of personalized support for diverse learning needs for students, unorganized structure of managing state for educators, and ineffective communication channels between educators and students.

Challenges:

- Manual attendance processes are prone to errors, leading to inaccuracies and administrative burdens.
- Students often struggle to receive tailored assistance to address their unique learning styles and academic requirements.
- Communication gaps hinder effective collaboration, feedback exchange, and information dissemination within educational institutions.

Objective:

- Our aim is to develop an innovative smart classroom solution that addresses these challenges comprehensively, leveraging advanced technologies to streamline processes, enhance efficiency, and improve educational outcomes for all stakeholders.



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Tech Stack

Languages : Typescript , Python

Frontend : Nextjs, tailwindcss , tanstack query

Backend : Flask , Nextjs

Database and tools : MongoDB , prisma , docker , pusher

ML Libraries : Tensorflow, OpenCV, Numpy, Face Recognition, OS, DateTime





Idea/Approach Details

Smart Attendance System:

- **Idea:** The idea is to implement an automated attendance tracking system using facial or voice recognition technology. This system will eliminate the need for manual attendance taking, saving time and reducing errors.
- **Approach:** Our approach involves utilizing advanced facial or voice recognition algorithms to accurately identify and mark attendance in real-time. Additionally, the system will continuously monitor attendance patterns and promptly alert users of any discrepancies or unusual patterns, ensuring data accuracy and reliability.

Personalized Learning Support:

- **Idea:** The concept is to provide personalized learning support tailored to each student's unique learning needs and preferences. This includes identifying areas for improvement and offering customized learning materials and feedback.
- **Approach:** To achieve this, we will analyze individual student performance data to identify strengths and weaknesses. Based on these insights, the system will recommend specific learning resources, exercises, and tutorials designed to address each student's learning gaps and enhance academic performance.



Idea/Approach Details

Enhanced Communication Tools:

- **Idea:** Our goal is to create a centralized communication platform that fosters seamless interaction between teachers and students. This platform will facilitate instant messaging, announcement broadcasts, and file sharing to promote collaboration and engagement.
- **Approach:** To realize this vision, we will develop user-friendly interfaces for teachers and students to communicate effectively. Features such as real-time messaging, announcement boards, and file-sharing capabilities will be integrated to streamline communication and enhance transparency within the educational environment.

Predictive Analytics:

- **Idea:** The idea involves leveraging machine learning algorithms to predict student performance and identify at-risk students before they fall behind. This proactive approach aims to improve academic outcomes and reduce dropout rates.
- **Approach:** Our approach entails analyzing historical student data to develop predictive models that anticipate future performance trends. These models will identify patterns indicative of students who may be struggling academically, enabling educators to intervene early and provide targeted support. Additionally, the system will provide educators with actionable insights for optimizing teaching methodologies and curriculum delivery based on data-driven analysis.



Describe your dependencies here

1. Facial Recognition API for automated attendance tracking.
2. Real-time Communication API for instant updates and notifications.
3. Machine Learning Libraries (TensorFlow, OpenCV) for predictive analytics.
4. Database Management System (MongoDB) for storing application data.
5. Web Frameworks (Next.js, Flask) for frontend and backend development.
6. Containerization Platform (Docker) for packaging and deploying the application.
7. Other relevant libraries and tools for specific functionalities.