Offline First Learning App

Team Name : Codex 2.0

Team lead : Akshita Singh Tyagi

Track : EdTech

PROBLEM STATEMENT

•Students in remote and low-connectivity regions face frequent disruptions in accessing learning materials, leading to lower engagement and inconsistent academic performance.

•Teachers spend substantial time manually grading assignments, delaying feedback and reducing time available for personalized student interaction and effective teaching.

PROPOSED SOLUTIONS

Offline-First Learning Platform with Automated Grading

•A Progressive Web App (PWA) ensuring seamless offline access to notes, assignments, and multimedia learning resources (PDFs, PPTs, videos).

•Automatic synchronization of offline activities and resources upon internet reconnection.

•Integration of AI-powered automatic grading system, evaluating students' uploaded assignments with detailed scoring and reasoning.

PROPOSED SOLUTIONS

Key Features of the Solution

•**Offline Learning Resources**: Robust local storage using IndexedDB (ChromaDB) and Service Workers.

•**AI-Based Grading (Reasoning LLM)**: Provides per-question scores with transparent explanations, customizable by educators.

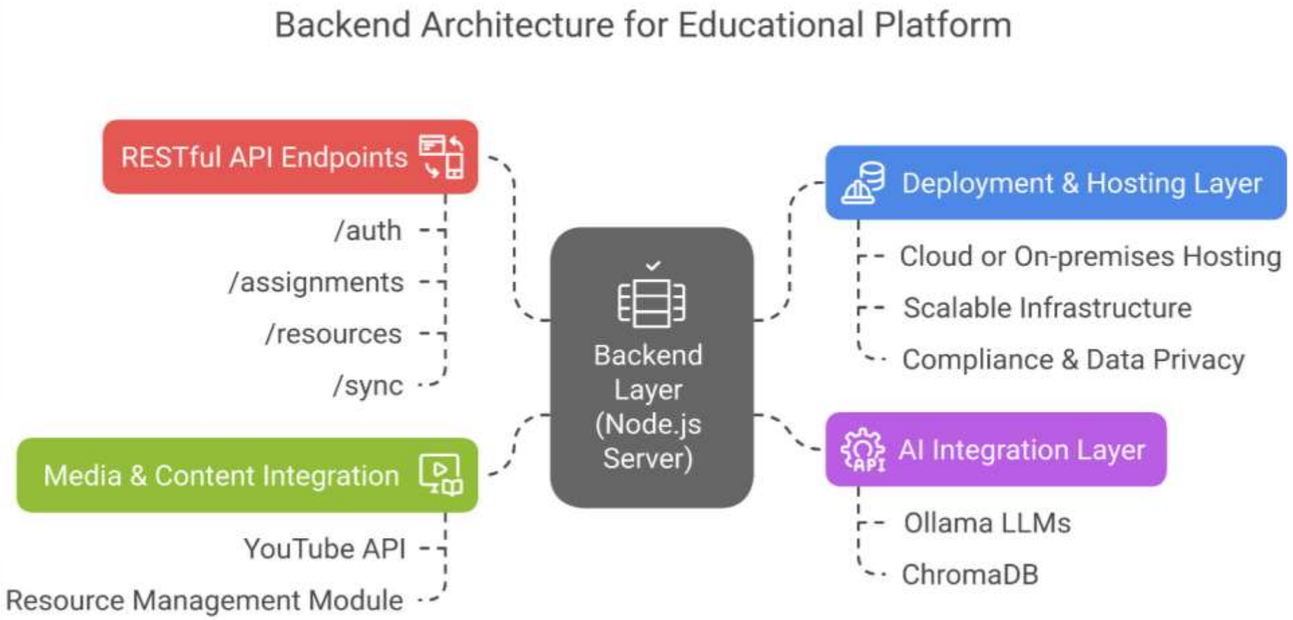
•**Resource Referencing**: Highlights and links exact resources used by AI for students' understanding.

•**Real-Time Sync & Notifications**: Automatic updates on assignment statuses and deadlines when online.

TECH STACK

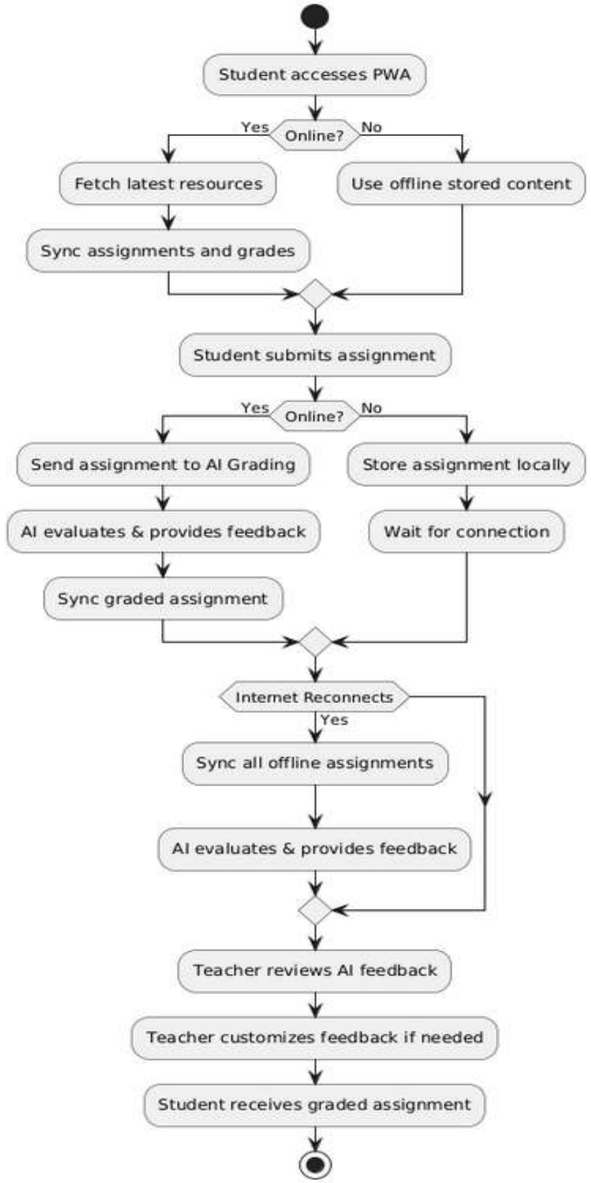
- **Frontend**: HTML, CSS, JavaScript, React
- **Backend**: Node.js, RESTful API
- **Offline Capabilities**: Service Workers, IndexedDB
- **AI Integration**: Ollama (Deepseek and Llama 3.2 LLMs), ChromaDB
- **Media & Resource Integration**: YouTube API, PDF/PPT content embedding
- **Data Synchronization**: Real-time syncing functionality upon reconnection

ARCHITECTURE DIAGRAM

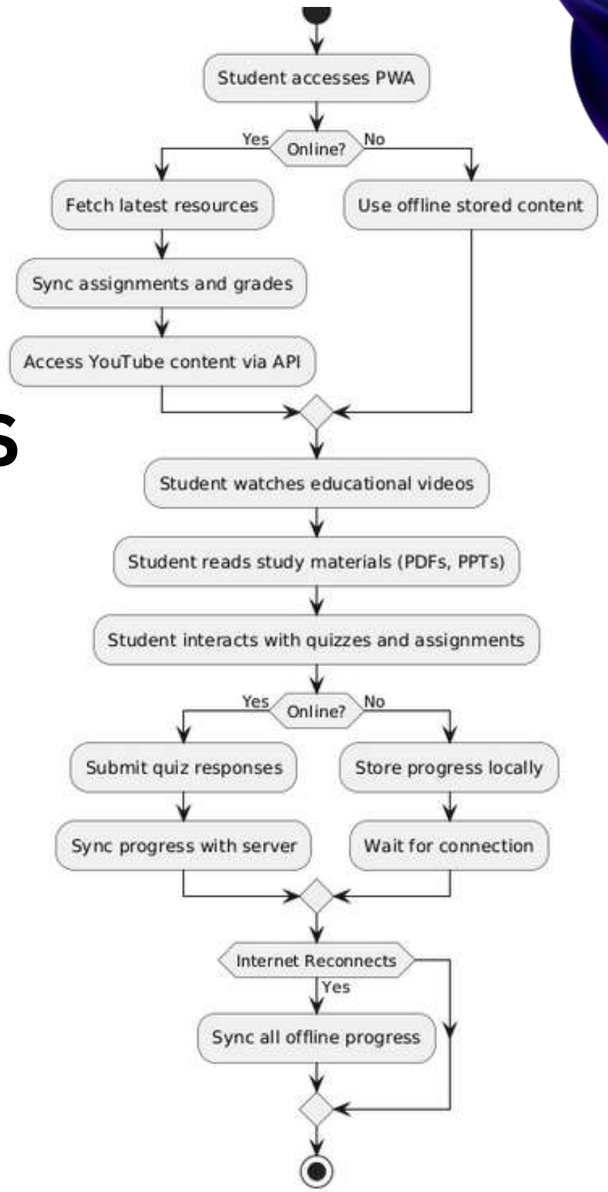


GLIMPSES

TEACHER CORRECTING



STUDENT LEARNING



FEASIBILTY AND SCALABILITY

Technical Feasibility

•Utilizes proven technologies (JavaScript, HTML, CSS, React, Node.js) and reliable offline web technologies (Service Workers, IndexedDB).

•Incorporates local AI model (Ollama with Deepseek and Llama 3.2) running efficiently offline and syncing intelligently when online.

•Integration with RESTful APIs and ChromaDB ensures effective data management and retrieval.

FEASIBILTY AND SCALABILITY

Scalability and Impact

•Easy integration with existing Learning Management Systems (LMS) and educational platforms through RESTful APIs.

•Scalable architecture enabling deployment in varied educational settings, from small classrooms to large institutions.

•Significant potential impact: Increased student engagement (target: +20%), reduced missed assignments (target: -30%), and enhanced academic outcomes through consistent access and immediate, detailed feedback.

TEAM MEMBERS

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