AI Assisted Online Learning Platform

Team A4

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Github repository :
https://github.com/AnirudhVijayaraghavan/CSYE7230-Software-Engineering-Project_A4/tree/main

Concept :

In today's ever-evolving education landscape, accessing and customizing learning experiences can be quite a challenge. With a growing number of learners seeking personalized education, the need for a solution that simplifies and tailors the learning journey has become necessary.

The Challenge:

In a world of endless learning possibilities, we often face the challenge of finding a personalized and simplified learning path. Traditional education systems don't always cater to our unique needs and preferences, leaving us searching for a solution that streamlines and customizes our educational journey.

Our Solution:

An AI Course Generator steps up to tackle these challenges head-on. It's like having a smart companion for your learning journey, reshaping the educational landscape by delivering educational content customized to your unique preferences, learning styles, and goals.

Key Features & Benefits:

1. Personalized Course Recommendations:
   Our AI algorithms provide you with course recommendations tailored to your interests and objectives, ensuring that your learning experience is both relevant and engaging.
2. Adaptive Learning Paths:
   The platform adapts course content and difficulty levels in real-time, catering to your progress and abilities, making your learning journey more engaging and effective.
3. Collaborative Learning Communities:
   You can connect with educators and fellow learners, creating a supportive learning environment where discussions and mutual support thrive, enhancing your overall educational journey.
4. Streamlined Content Access:
   Accessing a diverse library of courses and learning materials is just a click away, simplifying the process of acquiring knowledge and saving you time.
5. Interactive Assessments and Quizzes:
   Engage in interactive assessments and quizzes that help you gauge your knowledge and understanding, promoting active learning and skill development.
6. Learning Analytics Dashboard:
   Gain insights into your learning progress, achievements, and strategies for improvement, empowering you to make informed decisions about your educational path.
7. Seamless Integration with Educators:
   Educators can create, deliver, and adapt personalized courses, track your progress, and provide feedback tailored to your needs, enhancing your learning experience.

Links to the Epics :

- Link 1
- Link 2

Technology Stack :

Here's what we've used :

NEXT JS 13 (Server and Client side rendering, API integrations, Routing and Component Based Structure):

We've used Next.js 13 as a team to create a fast front end for our application. This framework provides client-side routing and server-side rendering for lightning-fast page loads and search engine optimization. Through API routes, it smoothly communicates with a variety of APIs, simplifying data extraction and manipulation.

With the addition of serverless functions in Next.js 13, our project's backend work has been made simpler by offering serverless APIs and endpoints.

Shad CN and Tailwind CSS (To provide seamless UI to interact with forms, stylized buttons, dropdown menus, and all other UI components) :

With its utility-first philosophy, Tailwind CSS excels at providing precise styling with little code duplication. Because of its adaptability and capacity for rapid prototyping, designers can quickly produce customized designs. The framework is an appealing option for preserving clean, scalable, and quick-loading styles in contemporary web development because of its speed optimization, support for responsive design, and active community.

In comparison to other UI component libraries, Shad-CN components have certain distinguishing features, such as a dedication to accessibility, a visually beautiful design system, and a vibrant community that actively participates in continuous advancements. These elements put inclusivity first, making sure that apps are usable by a variety of users. While community support assures current and feature-rich UI elements, their visually appealing and responsive design improves user experiences.

Unsplash API:

In our course management system, we integrate the Unsplash API to set up relevant thumbnails for each course, enhancing visual appeal and user engagement. Beyond our project, Unsplash API offers an extensive library of high-quality images, simplifying the process of sourcing visuals for various applications. This API streamlines content creation, reducing the time and effort required to find and incorporate captivating images, ultimately enhancing the overall user experience.

YouTube API and Open AI API:

The YouTube API and OpenAI work in synergy as part of our approach to course development. To create course content that is appropriate for a certain unit, we use the YouTube API. Through this interface, we can retrieve pertinent YouTube content to create a completely unique learning experience. We also use OpenAI to extract knowledge from video transcripts, which enables us to produce concept-based quizzes for every video.

Prisma DB Toolkit:

With a type-safe and user-friendly query builder, Prisma speeds up database access and lowers the possibility of runtime mistakes during database operations. Multiple databases are supported, making it flexible to project needs. Database evolution is made simpler by Prisma's schema migration tools, and application interaction is improved by real-time data synchronization. In general, Prisma speeds up development while enhancing data security in contemporary web apps.

Stripe Payment Gateway:

We are going to implement a secure gateway for customer transactions to give them premier membership and also eventually turn it into SAAS business.

Our team's project requires Stripe since it makes e-commerce, subscriptions, and secure online payments simple. It provides real-time analytics, excellent security, and configurable payment forms. It is the ideal fit for our international, mobile-focused project because it supports multiple currencies and has mobile SDKs.

Google Sign-In Using Next-Auth:

We have chosen NextAuth.js with Google Sign-In to seamlessly authenticate and authorize users for our application. This selection streamlines the authentication process, simplifying integration and ensuring a secure user experience

We can concentrate on providing a user-friendly authentication system while adhering to best practices in web security thanks to NextAuth.js's comprehensive security features, customizability, and interoperability with other frameworks.

Feasibility :

A thorough assessment of the AI Course Generator project's viability from a variety of angles is required to ensure its success within the allotted 12 weeks. The proficiency of our team with APIs is by far the most important consideration in establishing the viability of the project. Our development team's proficiency in API integration is essential to guaranteeing a smooth procedure given our intention to integrate external services like Unsplash, YouTube, and OpenAI. Given that integrating these services will have a substantial impact on the system's operation and performance, this technical proficiency is a cornerstone of the project's viability.

Another aspect of viability is our emphasis on performance, demonstrated by our choice of Next.js 13 as the framework. With this decision, we gain the capacity for quick server and client-side rendering, which is essential for offering a responsive and effective AI-driven course generating platform. Along with this, our narrow focus on feature selection, focusing on basic functionality in line with the main project objectives, increases the project's viability. Prioritizing crucial features reduces scope creep and better aligns resources, which helps the development process run more smoothly.

Additionally, for feasibility, maintaining the dependability of third-party APIs through careful selection and routine monitoring is essential. Through this proactive strategy, potential development barriers are reduced and external dependencies are kept secure and stable.

Capability :

Front end Development:

Sunil possesses the most expertise with majority of the tools required to implement the proposed application. Our team uses the power of Next.js 13 to deliver exceptional front-end performance and user experiences. This framework provides client-side routing and server-side rendering, which means our pages will load lightning-fast and be highly SEO-friendly.

Kaushik is also familiar with Javascript. He has experience using Flutter to create smartphone applications for Android devices.

Arvind can manage the UI design and HTML/CSS components which will enable us to maintain scalable and fast-loading styles ensuring that the application is visually appealing and usable by a wide range of users.

Backend Development:

Devki and Anirudh will play a key role in integrating APIs effectively which will result in highly personalized and interactive learning experiences for the users to have an extremely interesting and educational experience.

Kaushik will also contribute to optimizing the database operations required for the project. He has completed a Database management course and is familiar with Real-time data synchronization which will further enhance the performance of the application

Anirudh will be instrumental in implementing the Secure stripe payment gateway which offers real-time analytics and configurable payment forms also, we have chosen NextAuth.js with Google Sign-In to seamlessly authenticate and authorize users for our application.

We believe that our approach will seamlessly combine front-end and back-end capabilities, enhancing resource management and development efficiency to implement the project within the 7-week time limit.