PROJECT REPORT ON

STUDENT MITRA

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CERTIFICATE

This is to certify that Gaurav Kumar (221IT027), Lakshit Sharma(221IT040) and Sonali (221IT065) have successfully completed the project titled “Multi-User Chat System” students of IV semester B.Tech. (IT), Department of Information Technology, National Institute of Technology Karnataka, Surathkal, on 25 March 2024, during the even semester of the academic year 2023 - 2024, in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology in Information Technology.

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Prof. Geetha V	Deepa C
HOD, IT Department	Prof., IT Department

Declaration

We hereby declare that this report entitled "**Student Mitra**" is the result of our own work except where otherwise acknowledged. It has not been submitted for any other degree or examination in any other university.

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INTRODUCTION

At Student Mitra, our mission is to empower learners of all backgrounds with accessible, high-quality educational resources. We understand the importance of both free and paid courses in catering to diverse learning needs, and we are committed to providing a comprehensive range of technical courses to equip our users with the skills necessary to thrive in today's rapidly evolving world.

Scope:

Student Mitra is a dynamic educational platform offering a wide scope of courses designed to meet the diverse needs and interests of learners. Our scope encompasses:

Free Courses: We believe in the democratization of education. Hence, we offer a variety of free courses across different subjects and disciplines. These courses are accessible to all users, irrespective of their financial capabilities, ensuring that education remains inclusive and equitable.

Paid Courses: In addition to our free offerings, Student Mitra provides premium paid courses that delve deeper into specialized topics and provide advanced learning experiences. These courses are curated by industry experts and educators, ensuring relevance and quality.

Technical Courses: Recognizing the growing demand for technical skills in today's job market, we offer a wide array of technical courses covering topics such as programming, data science, artificial intelligence, cybersecurity, and more. These courses are designed to equip learners with practical skills that are highly sought after in the professional world.

Objectives:

Our objectives at Student Mitra are clear and focused, aimed at providing a valuable learning experience for our users:

Accessibility: To make education accessible to all by offering a diverse range of free courses and ensuring affordability and value in our paid offerings.

Quality: To uphold the highest standards of quality in course content, instructional design, and learning outcomes, ensuring that our users receive a rich and engaging learning experience.

Relevance: To continuously update and expand our course catalog to reflect the latest trends, technologies, and industry requirements, ensuring that our users are equipped with the most relevant and up-to-date skills.

Support: To provide comprehensive support to our users throughout their learning journey, including access to instructors, community forums, and additional resources to enhance their learning experience.

Impact: To measure and evaluate the impact of our courses on the lives and careers of our users, striving to make a meaningful difference in their personal and professional development.

At Student Mitra, we are committed to empowering learners to unlock their full potential and achieve their goals. Join us in the pursuit of knowledge and skills, and let us be your trusted companion on your educational journey.

METHODOLOGY

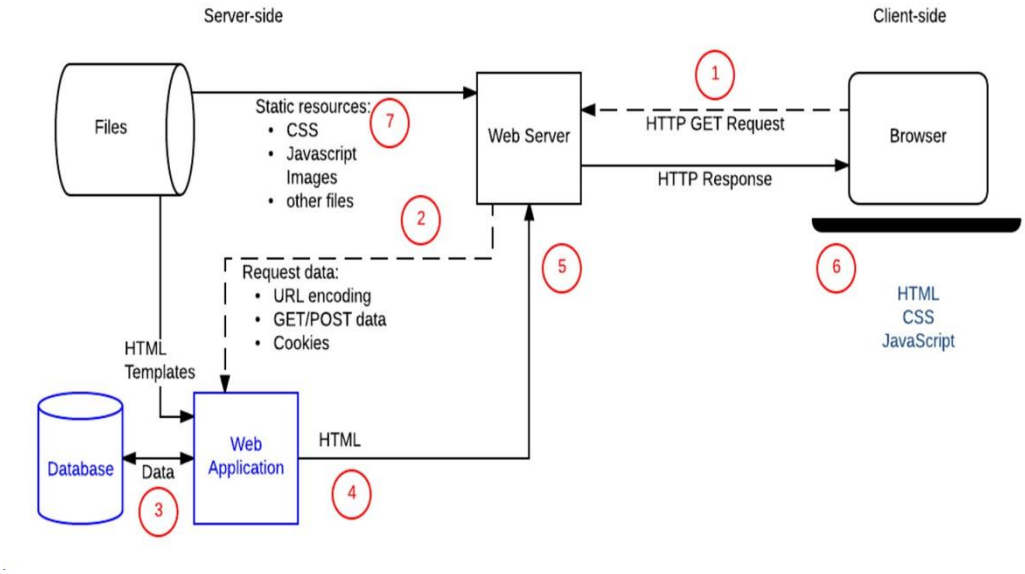


Fig.2.1

Client – server Web Architecture

Web Applications

A web application is a program that runs on a server and is rendered by a client browser, using the internet to access all the resources of that application. It usually can be easily broken down into three parts:

1. Client
2. Server
3. Database

Fig: 2.2

Client

The user interacts with the front-end part of a web application. The front-end is usually developed using languages like HTML and CSS styles, along with extensive usage of JavaScript-based frameworks like ReactJS and Angular, which help with application design.

Server

The server is responsible for taking the client requests, performing the required tasks, and sending responses back to the clients. It acts as a middleware between the front-end and stored data to enable operations on the data by a client. Node.js, PHP, and Java are the most popular technologies in use to develop and maintain a web server.

Database

The database stores the data for a web application. The data can be created, updated, and deleted whenever the client requests. MySQL and MongoDB are among the most popular databases used to store data for web applications.

Node.js Server Architecture

Node.js uses the “Single Threaded Event Loop” architecture to handle multiple concurrent clients. Node.js Processing Model is based on the JavaScript event-based model along with the JavaScript callback mechanism.

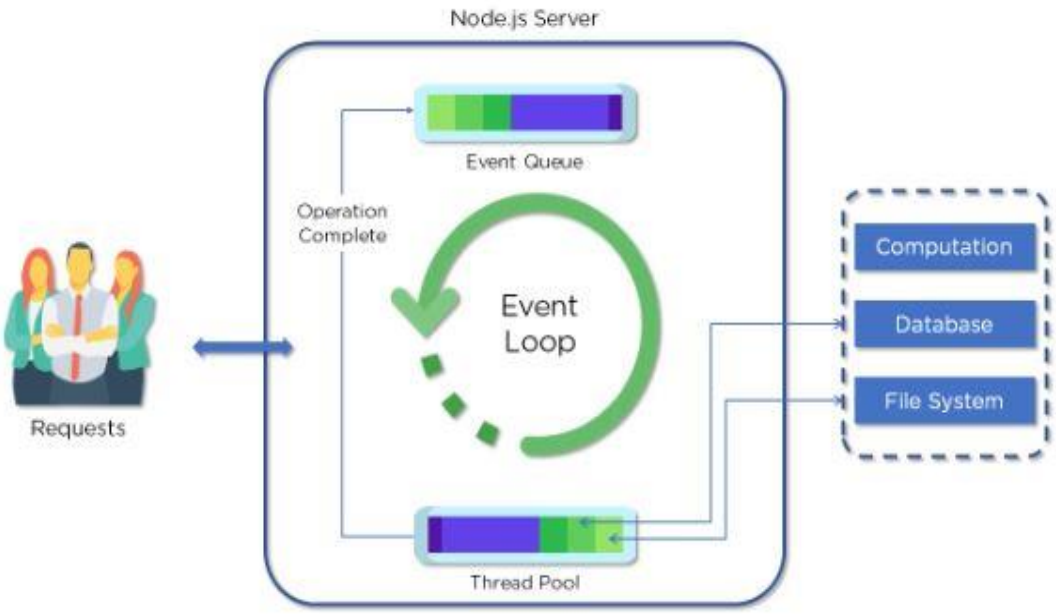


Fig.2.3

Parts of the Node.js Architecture:

Requests

Incoming requests can be blocking (complex) or non-blocking (simple), depending upon the tasks that a user wants to perform in a web application

Node.js Server

Node.js server is a server-side platform that takes requests from users, processes those requests, and returns responses to the corresponding users

Event Queue

Event Queue in a Node.js server stores incoming client requests and passes those requests one-by-one into the Event Loop

Thread Pool

Thread pool consists of all the threads available for carrying out some tasks that might be required to fulfill client requests

Event Loop

Event Loop indefinitely receives requests and processes them, and then returns the responses to corresponding clients

External Resources

External resources are required to deal with blocking client requests. These resources can be for computation, data storage, etc.

Fig.2.4

The Fig.2.4 shows how the MongoDB works:

Working of MongoDB –

MongoDB work in two layers –

- **Application Layer** and

- **Data layer**

Application Layer is also known as the **Final Abstraction Layer**, it has two-parts, first is a **Frontend (User Interface)** and the second is **Backend (server)**. The frontend is the place where the user uses MongoDB with the help of a Web or Mobile. This web and mobile include web pages, mobile applications, android default applications, IOS applications, etc. The backend contains a server which is used to perform server-side logic and also contain drivers or mongo shell to interact with MongoDB server with the help of queries.

These queries are sent to the MongoDB server present in the **Data Layer**. Now, the MongoDB server receives the queries and passes the received queries to the storage engine. MongoDB server itself does not directly read or write the data to the files or disk or memory. After passing the received queries to the storage engine, the storage engine is responsible to read or write the data in the files or memory basically it manages the data.

IMPLEMENTATIONS

TOOLS AND TECHNOLOGY:

- **HTML:**
  HTML is used to structure the content of the website, defining elements such as headings, paragraphs, images, and links, providing the backbone of the site's layout and organization.
- **CSS**
  CSS is utilized to style and design the website's HTML elements, including aspects such as colors, fonts, layout, and responsiveness, ensuring a visually appealing and cohesive user interface.
- **JavaScript**
  JavaScript adds interactivity and dynamic functionality to the website, enabling features such as interactive quizzes, dropdown menus, form validation, and asynchronous data loading, enhancing user engagement and usability.
- **Node JS**
  Node.js is used as the backend runtime environment, facilitating server-side logic and handling requests from the client-side, enabling the website to interact with databases, process user inputs, and manage sessions securely
- **Mongo Db**
  MongoDB serves as the database management system, storing and managing the website's data, including user profiles, course information, progress tracking, and user-generated content, ensuring efficient data retrieval and storage.
- **Bootstrap**
  Bootstrap is a front-end framework used for building responsive and mobile-first websites, providing pre-designed CSS and JavaScript components that streamline the development process, ensuring consistent and visually appealing design across different devices and screen sizes.
- **Express JS**
  Express.js is a web application framework for Node.js, used to develop the backend infrastructure of the website, handling routing, middleware integration, and server configuration, facilitating the creation of robust and scalable web applications.

These technologies work together synergistically to create a feature-rich, responsive, and user-friendly educational website like Student Mitra, offering a seamless learning experience to users.

The entire program is written in hbs, css and js. The server is getting started with nodejs at backend. Then it connects to mongodb database. For email sending to the developer one online captcha verification tool is used. For form validation we are using js functions that ensures that:

-> The phone number input field does not take a input of more than 10 digits.

-> The email id is proper in the standard format.

-> The query field has at least 10 characters to submit.

If all these criteria are not satisfied then the query form will not get submitted.

RESULTS

FLOW CHART OF COMPLETE WEBSITE

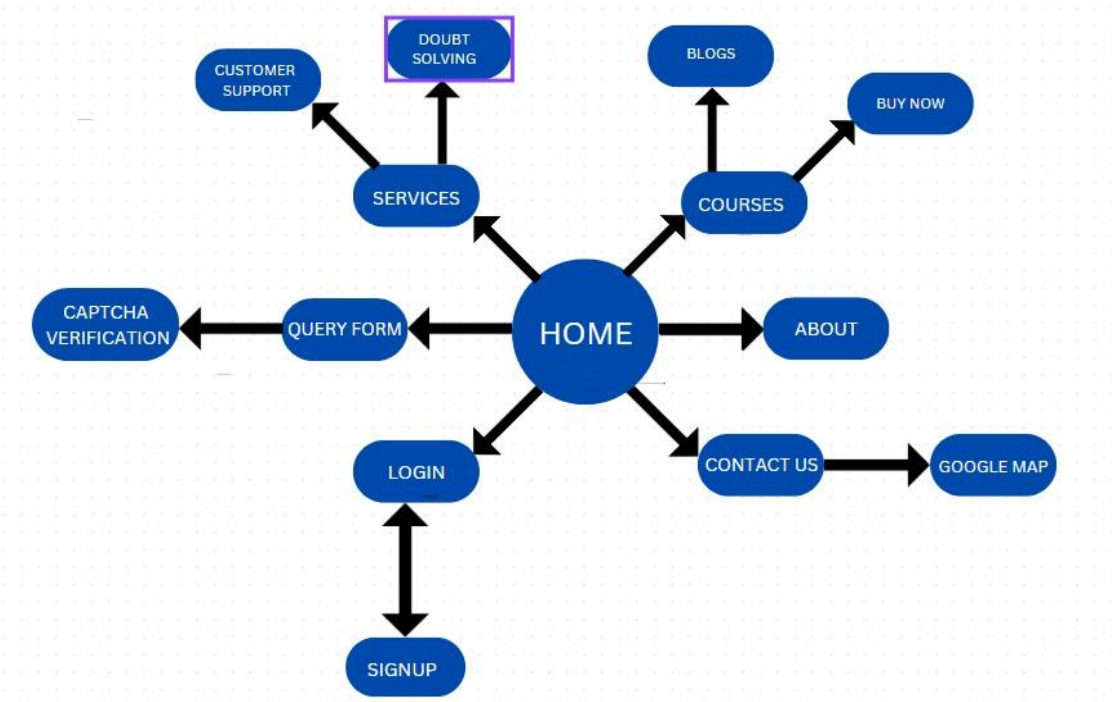


Fig.4.1

HOME PAGE

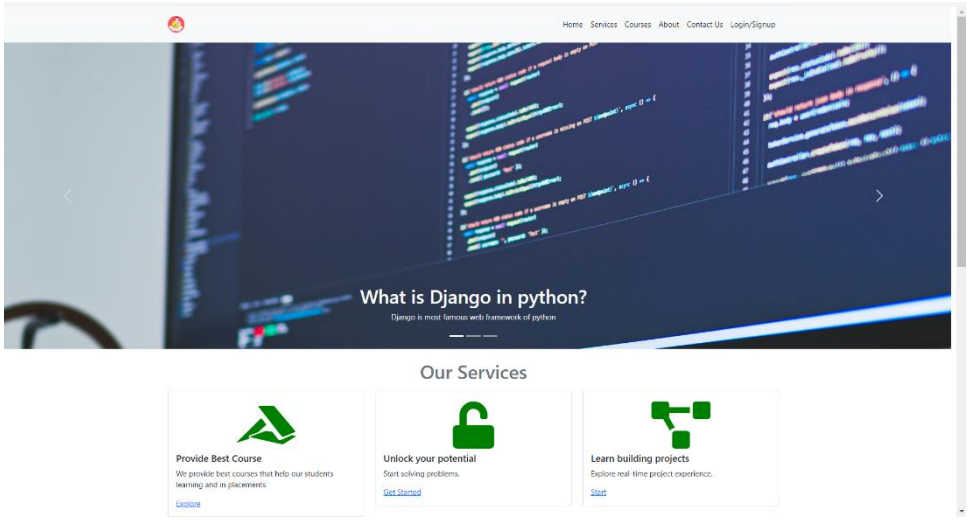
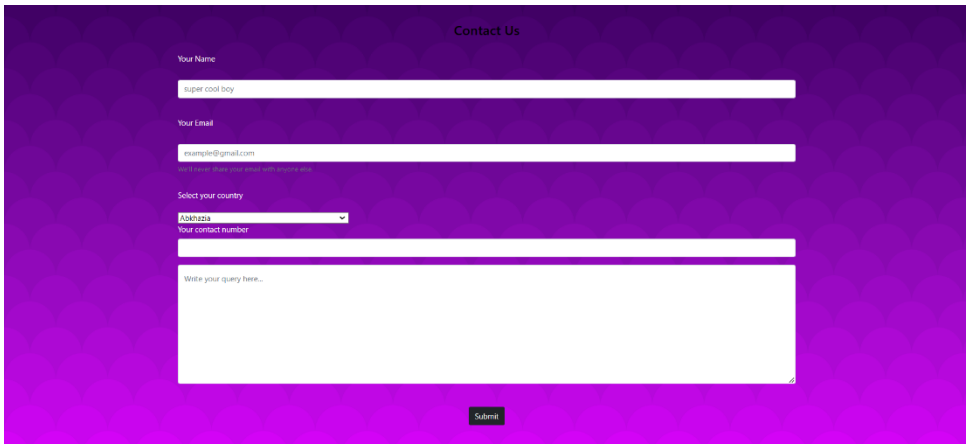
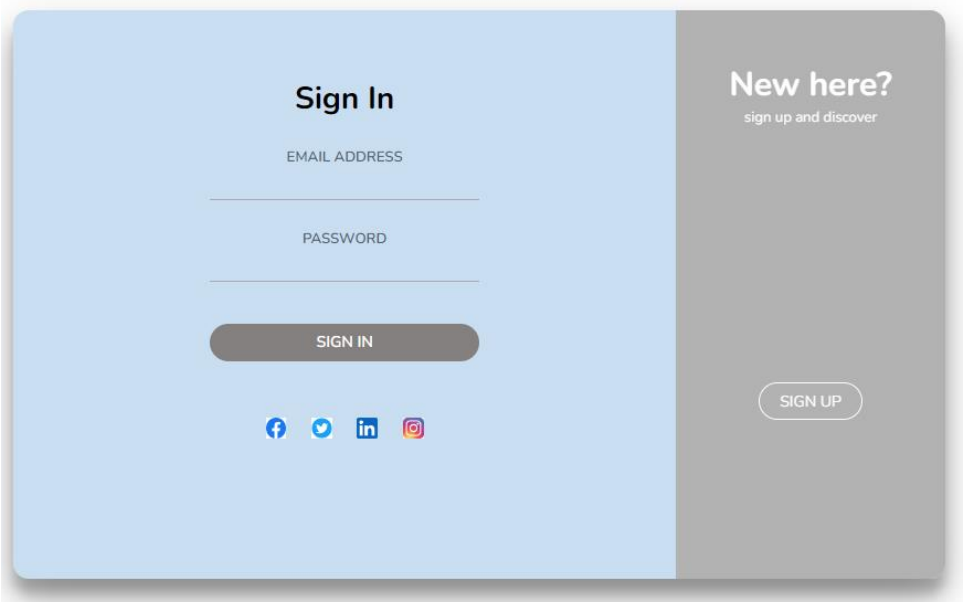


Fig.4.2

QUERY FORM



LOGIN/SIGNUP FORM



COURSES PAGE

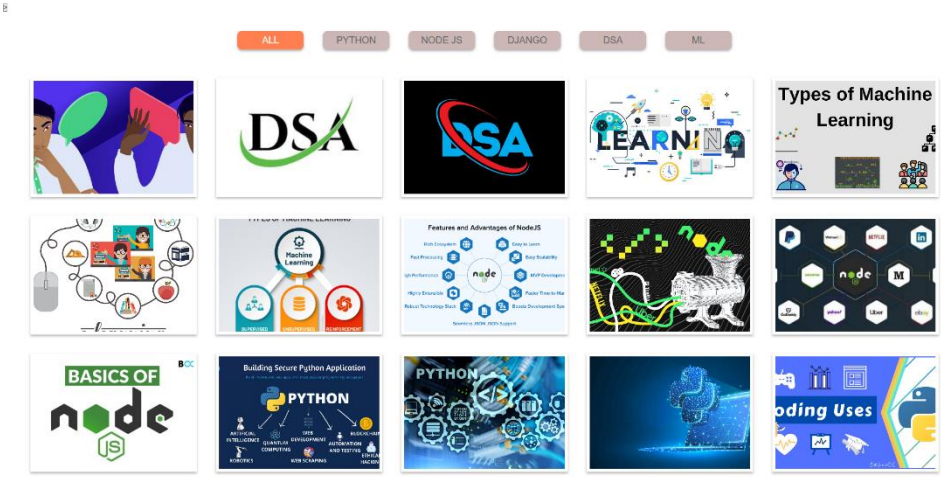


Fig.4.3

CONTACT-US PAGE

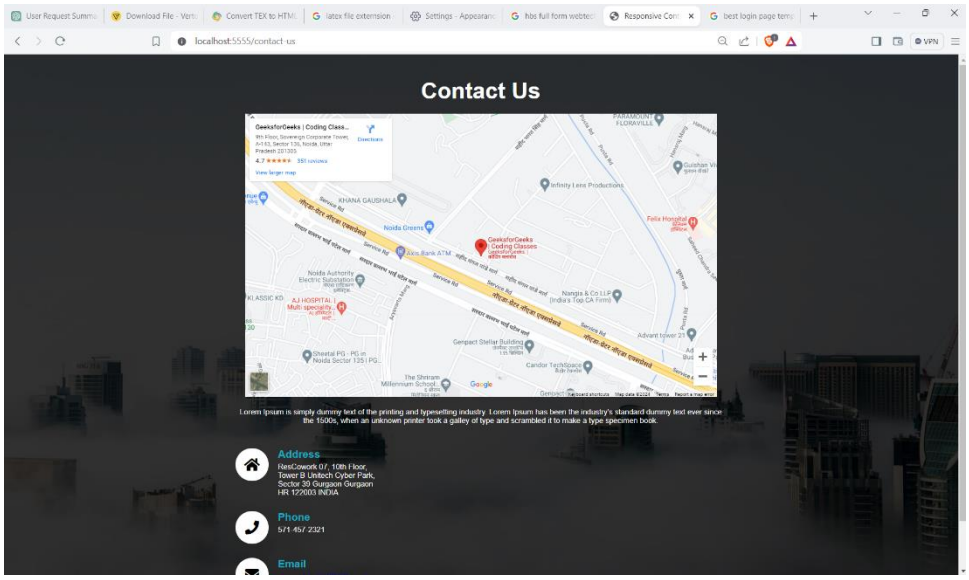
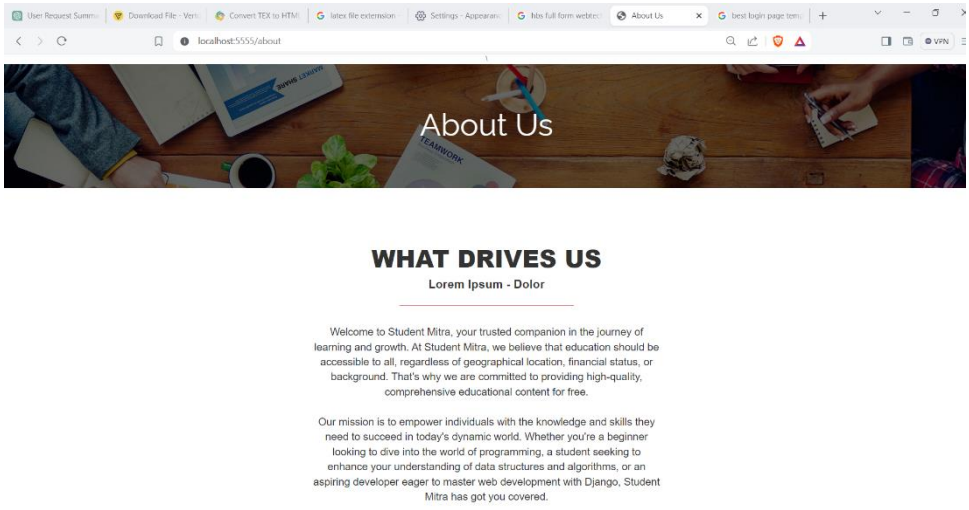


Fig.4.4

ABOUT-US PAGE



FUTURE WORKS

Personalized Learning Paths:

Implement AI algorithms to analyze student learning patterns and preferences.

Offer personalized recommendations for courses, modules, and resources tailored to individual needs.

Interactive Learning Modules:

Develop more interactive and engaging learning modules with multimedia content such as videos, simulations, and quizzes.

Integrate gamification elements to enhance student motivation and participation.

Virtual Labs and Experiments:

Incorporate virtual lab environments for science and engineering disciplines, enabling students to conduct experiments remotely.

Provide simulations and virtual reality experiences to supplement theoretical learning with practical application.

Peer Collaboration Tools:

Enhance features for collaborative learning, including discussion forums, group projects, and peer-to-peer mentoring.

Integrate tools for real-time collaboration, such as virtual whiteboards and video conferencing.

Assessment and Feedback Mechanisms:

Implement adaptive assessment techniques to evaluate student progress accurately.

Offer instant feedback on assignments and quizzes to facilitate continuous learning and improvement.

Accessible Learning Resources:

Ensure compatibility with assistive technologies to accommodate students with disabilities.

Provide multilingual support to cater to a diverse student population.

Career Development Support:

Offer resources for career exploration, including resume building, interview preparation, and internship opportunities.

Connect students with alumni networks and industry professionals for mentorship and networking.

Mobile Optimization:

Develop a mobile app for on-the-go learning, allowing students to access course materials and participate in activities from their smartphones or tablets.

Ensure responsiveness and usability across a variety of devices and screen sizes.

Analytics Dashboard for Educators:

Provide educators with insights into student engagement, performance, and learning outcomes through a comprehensive analytics dashboard.

Enable instructors to track student progress and intervene when necessary to provide additional support.

Integration with Learning Management Systems (LMS):

Integrate seamlessly with existing learning management systems used by educational institutions to facilitate easy adoption and integration into the curriculum.

Ensure compatibility with popular LMS features such as gradebooks, course calendars, and attendance tracking.

Continuous Content Updates and Expansion:

Regularly update course content to reflect the latest advancements and developments in various fields.

Expand the range of courses offered to cover a broader spectrum of subjects and disciplines.

Community Engagement and Support:

Foster a sense of community among students through social features like user profiles, messaging, and interest groups.

Provide dedicated support channels for students to seek assistance from instructors and peers.

By focusing on these areas, MITRA can continue to evolve and provide a comprehensive and enriching educational experience for students

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