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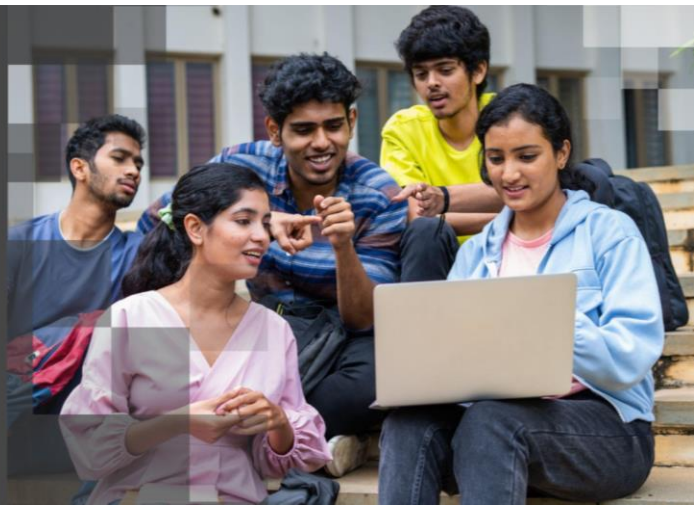
Consulting Chronicles:

Project Overview 2024



Intern Name**: Sneha Manna** Practice Name: Cloud & Digital Engineering

Project Title: Learning Management System

Description:

➢ Main Assumptions

- The project presumes that integrating an LMS will significantly streamline the educational process.
- It is anticipated that the LMS will be a central hub for students to engage with their academic materials and activities.
- The assumption is that the LMS will facilitate a measurable improvement in student performance and satisfaction.
- It is assumed that the LMS will allow for scalable and efficient assessment creation by trainers.

➢ Understanding & Objectives

Understanding:

- The understanding of this project is to develop a website with an online learning management system (LMS) using technologies like React.js, Express.js, Node.js, and Cosmos DB for the backend. The website will allow students to access course materials, take assessments, and receive suggested courses based on their performance. The goal is to enhance student engagement, improve learning outcomes, and provide trainers with the ability to upload courses and receive notifications when students enroll.

Objectives:

- Develop an LMS that provides interactive and flexible learning opportunities.
- Ensure students can access educational resources anytime, enhancing their ability to learn and participate.
- Provide personalized learning paths to support individual student needs.

Key Activities:

- Design program structure and layout of web application.
- Build a working backend in Node.js with functional API endpoints.
- Add support for database operations using Azure services: Cosmos DB and Blob Storage.
- Assemble frontend web pages and integrate with existing API.

Technical Skills Used:

1. Application: The application, which includes MongoDB, Express.js, React, and Node.js, would form the core of the application. MongoDB would be used to store data such as user profiles, course materials, and progress tracking. Express.js will handle the server-side logic, while React will be used for building the user interface. Node.js will serve as the runtime environment for executing the server-side code.

2. Azure Blob Storage: This is used to store large binary objects: video files, thumbnails, and other course materials. Azure Blob Storage is scalable and provides a cost-effective way to store large amounts of unstructured data.

3. Cosmos DB: As a globally distributed database service, Cosmos DB is used to store and manage user interactions and other transactional data with low latency and high throughput, ensuring a responsive experience for users across the globe. It also stored the metadata of the videos and thumbnail in blob storage.

4. Azure Functions: These provide a serverless compute service that enables you to run event-triggered code for sending email notifications whenever there are updates.

Outcomes:

- Development of a fully functional Learning Management System (LMS) website using technologies like React.js, Express.js, Node.js, and Cosmos DB.

- Integration of an LMS that serves as a central hub for students to access

course materials, take assessments, and receive suggested courses based on their performance.

- Improved student engagement and learning outcomes through the use of an interactive and flexible learning platform.
- Scalable and efficient assessment creation for trainers, allowing for streamlined evaluation of student performance.
- Personalized learning paths for students, supporting individual needs and enhancing the learning experience.
- Integration of Azure Blob Storage to store large binary objects such as video files and course materials.
- Utilization of Cosmos DB for globally distributed database service, ensuring low latency and high throughput for user interactions and transactional data.
- Implementation of Azure Functions for event-triggered code, enabling email notifications for updates in the LMS.

Learning:

- Familiarity with React.js, Express.js, Node.js, and Cosmos DB for web application development.
- Understanding of the role and benefits of an LMS in streamlining the educational process.
- Knowledge of integrating Azure services like Blob Storage and Cosmos DB into web applications.
- Experience with designing program structure and layout for web applications.
- Proficiency in building functional API endpoints using Node.js.
- Understanding of serverless compute services like Azure Functions for event-triggered code execution.
- Ability to create personalized learning paths and enhance student engagement through interactive learning platforms.