PROFESSIONAL READINESS FOR INNOVATION, EMPLOYABILITY AND ENTREPRENEURSHIP

StudyFlow

STUDENT'S LEARNING MANAGEMENT SYSTEM

Problem Statement

In many academic institutions, students face challenges in managing their academic responsibilities due to fragmented and outdated digital platforms. Most existing Learning Management Systems (LMS) either lack modern user experiences or are designed primarily for administrative needs, neglecting student usability and engagement. This leads to poor visibility of academic progress, scattered communication of assessments, and difficulty in managing coursework, attendance, and certifications.

Existing Systems

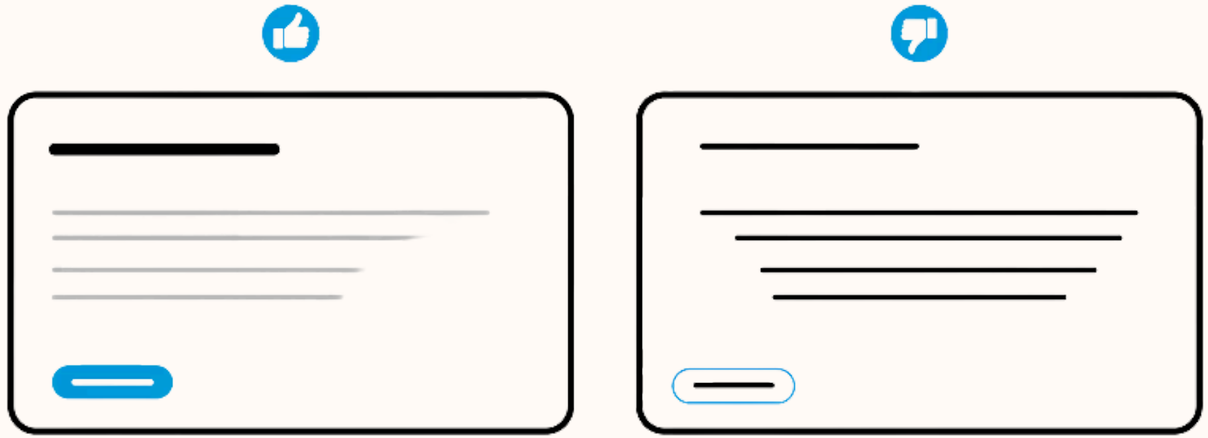
Current Solutions in Use:

- Moodle: Open-source LMS widely adopted by universities and institutions.
- Google Classroom: Simplified, easy-to-use platform integrated with G-Suite.
- Blackboard: Enterprise-level LMS used in many global institutions.
- Canvas: Cloud-based LMS with mobile support and integration features.
- Institution-specific Portals: Custom-built internal systems used by colleges (e.g., Anna University's COE Portal, SRM's iConnect).

Existing Systems

Major Limitations:

- Poor User Experience
- Fragmented Features
- Lack of Personalization.
- Limited Integration & Feedback
- Accessibility & Responsiveness



Existing Systems

Need for Improvement:

- A Unified, Student-Centric Platform
- Real-Time Updates & Customization
- Smart File Handling & Assessment Submission
- Improved Engagement
- Lightweight & Local Deployability

Objectives

- Develop a centralized Learning Management System (LMS) tailored for students.
- Provide a clean, responsive, and intuitive user interface.
- Enable seamless login and role-based access for students.
- Display personalized dashboard with academic overview (courses, CGPA, assessments, attendance).
- Dynamically render current semester courses with type, instructor info.
- Track and visualize subject-wise and overall attendance.
- Allow subject-specific assessment viewing and file submissions before deadlines.
- Provide upload and management of certificate documents with metadata.
- Ensure secure authentication using JWT tokens and API protection.
- Build scalable backend using FastAPI and MySQL, integrated with the React frontend.

Abstract

The proposed project, StudyFlow – Student's Learning Management System, is a web-based academic platform designed to streamline and enhance the student learning experience through an integrated and user-friendly interface. The system empowers students by providing a personalized dashboard that displays critical academic information such as enrolled courses, current CGPA, attendance, upcoming assessments, and submitted certificates.

Developed using React for the frontend and Python (FastAPI) with MySQL for the backend, StudyFlow offers modular features including real-time subject-wise attendance tracking, subject-specific assessments with file upload capability, semester-based course rendering, and a secure certificate management system. A secure authentication mechanism using JWT tokens ensures safe and personalized access.

This project addresses the inefficiencies in traditional, fragmented academic portals by offering a centralized, modern, and responsive solution. By integrating academic data across modules into a single platform, StudyFlow reduces redundancy, improves accessibility, and enhances student autonomy in tracking their academic progress.

Proposed System

- A centralized and responsive web-based LMS built using React (frontend) and FastAPI with MySQL (backend).

- Provides a personalized student dashboard displaying key academic metrics: Name, Degree, Branch, Year, CGPA, and current semester courses.

- Modular system includes:
  - Courses Module – Displays subject-wise course details filtered by semester.
  - Attendance Module – Shows subject-wise and overall attendance percentage with status indicators.
  - Assessments Module – Subject-based assignment viewing, file upload, and deadline tracking.
  - Learning Pathways – Visual progress tracking for each subject with status and next actions.
  - Certificates Module – Upload, view, and manage course certificates in PDF format.

- Secure login and session handling using JWT-based authentication.

- RESTful API integration between frontend and backend for dynamic data fetching and submission.

- Mobile-friendly and accessible design for use across devices.

System Architecture

Frontend (React.js)

- Built with React and Vite for fast performance
- Uses React Router for navigation & Axios for API calls
- JWT stored in localStorage for auth
- Global CSS for clean, responsive UI

Backend (FastAPI – Python)

- FastAPI handles RESTful API, auth & business logic
- OAuth2 with JWT for secure session management
- Modular codebase with routers, schemas, and models

Database (MySQL via XAMPP)

- Stores student info, courses, attendance, assessments, certificates
- Uses SQLAlchemy ORM for DB interaction

System Architecture

Workflow

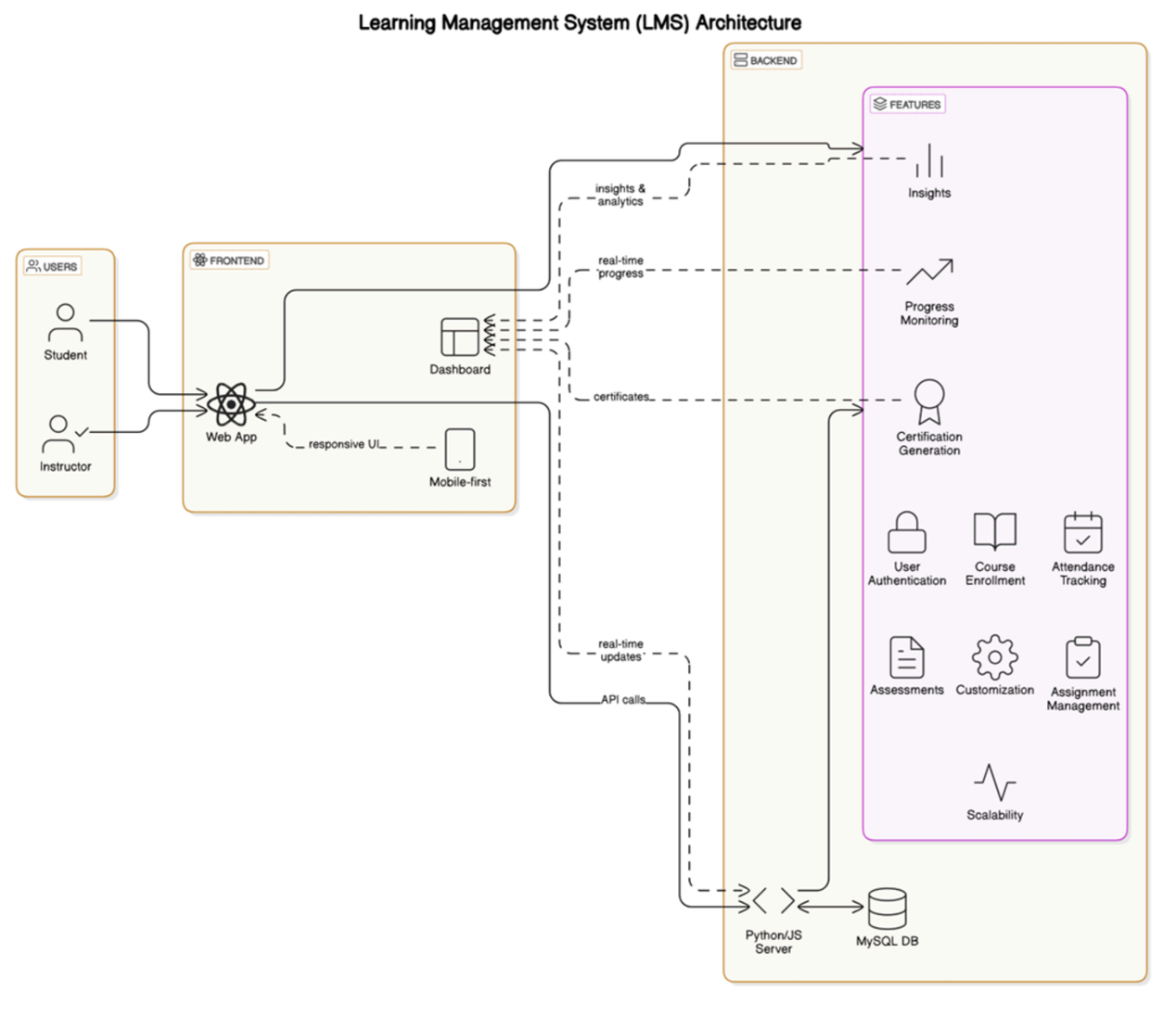
- Login → JWT returned & stored
- API calls use token → Fetch/store data in MySQL
- Backend responds with JSON → Frontend renders UI

Security

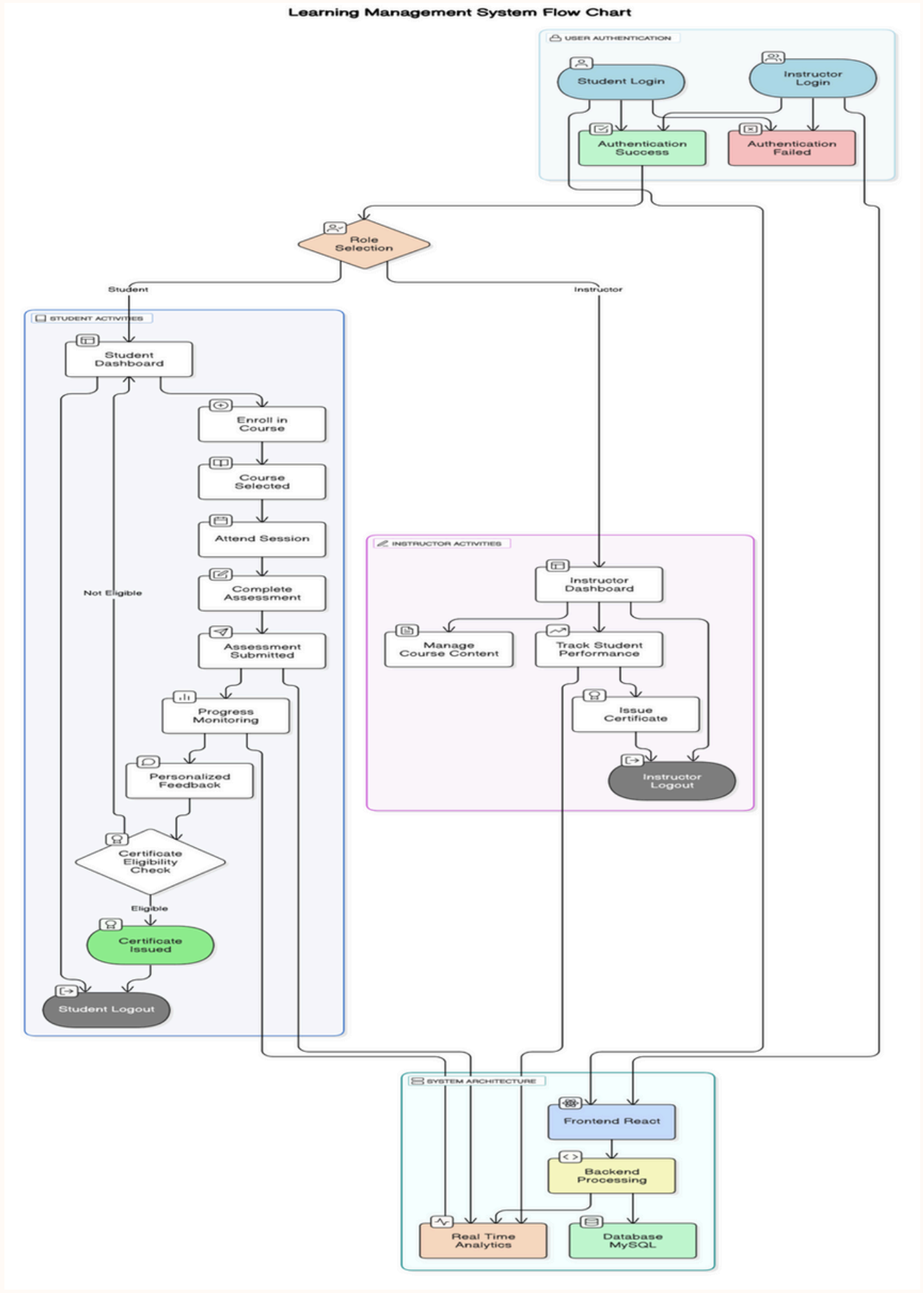
- CORS enabled for localhost:5173
- Auth middleware protects routes

This setup ensures fast, modular, and scalable LMS development.

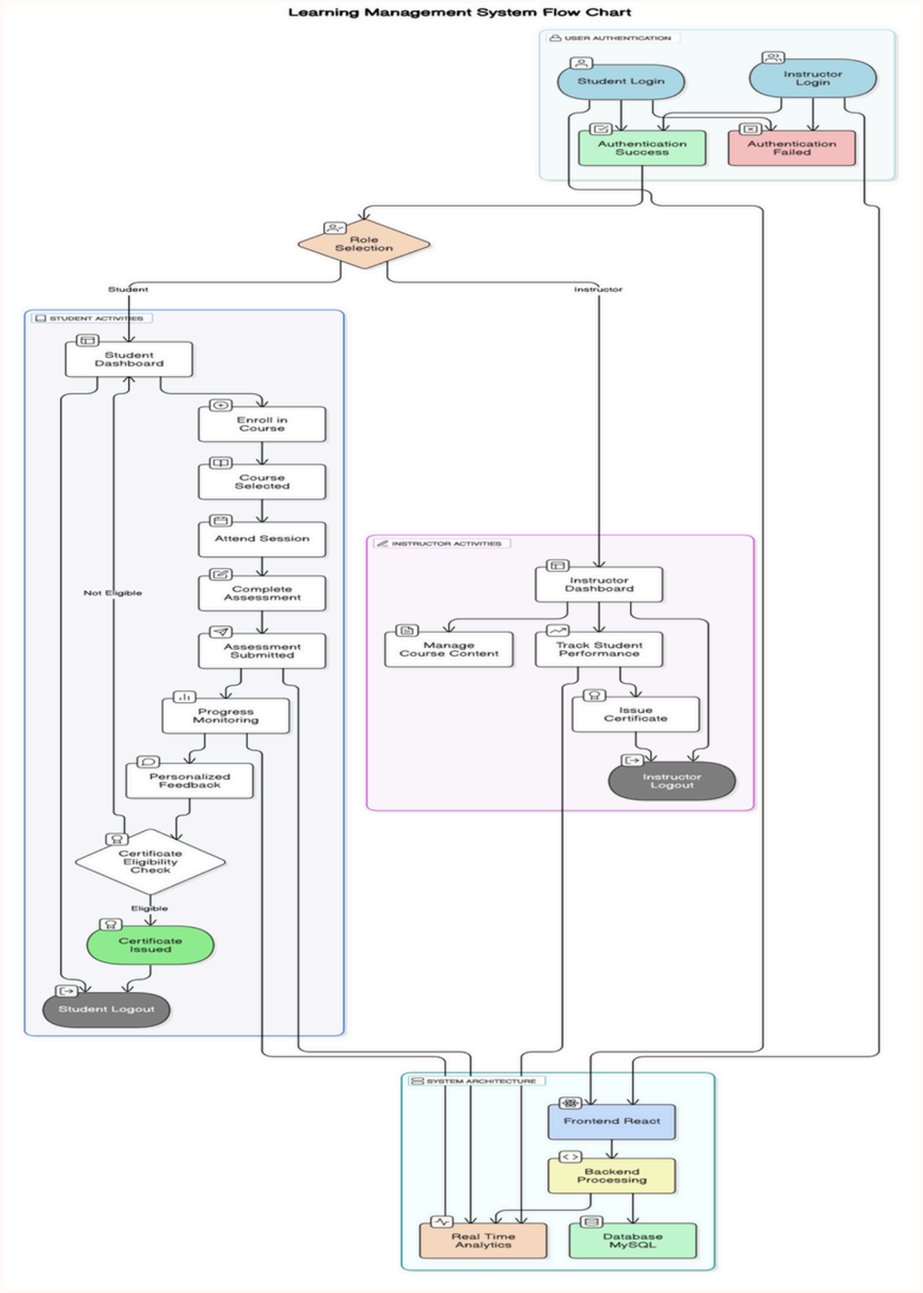
Architecture Diagram



DFD Diagram


Learning Management System Flow Chart
USER AUTHENTICATION
Student Login
Instructor Login
Authentication Success
Authentication Failed
Role Selection
Student
Instructor
STUDENT ACTIVITIES
Student Dashboard
Enroll in Course
Course Selected
Attend Session
Complete Assessment
Not Eligible
Assessment Submitted
Progress Monitoring
Personalized Feedback
Certificate Eligibility Check
Eligible
Certificate Issued
Student Logout
INSTRUCTOR ACTIVITIES
Instructor Dashboard
Manage Course Content
Track Student Performance
Issue Certificate
Instructor Logout
SYSTEM ARCHITECTURE
Frontend React
Backend Processing
Real Time Analytics
Database MySQL

Activity Diagram



Conclusion and Future Works

Conclusion

- StudyFlow provides an efficient and user-friendly Learning Management System for students.
- It centralizes key academic data like attendance, assessments, courses, and certificates.
- The integration of React (frontend), FastAPI (backend), and MySQL ensures performance, scalability, and maintainability.

Future Work

- Add Admin and Faculty roles for course and assessment management.
- Enable push notifications and email reminders for deadlines.
- Integrate data analytics for performance tracking and insights.
- Support cloud storage (e.g., AWS S3) for scalable file uploads.
- Implement mobile app version for improved accessibility.