Academic File Sharing Portal

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***Abstract*—The Academic File Sharing Portal is a web-based platform designed to streamline the submission, access, and sharing of academic documents between students and faculty. It provides role-specific interfaces: the STUDENT MODULE allows students to upload academic records and share semester notes, while the FACULTY MODULE enables instructors to view and download files and distribute class materials. Built on the MERN stack (MongoDB, Express.js, React.js, Node.js) with React-Bootstrap for a responsive UI, the portal supports features like theme toggling and semester-wise file organization. This system digitizes document management, reduces administrative overhead, and fosters collaborative learning.**

***Index Terms*—File Sharing, Academic Portal, MERN Stack, Cloud-based Learning, Digital Document Management, Table of Contents**

I. INTRODUCTION

In the current digital era, educational institutions are increasingly adopting cloud-based and web-based solutions to improve academic workflows. Traditional methods of sharing notes, submitting assignments, and exchanging documents are often inefficient and prone to loss of information. Learning Management Systems (LMS) like Google Classroom, Microsoft Teams, and Moodle provide solutions but are some- times too complex or resource-heavy for smaller institutions. The Academic File Sharing Portal addresses this gap by providing a lightweight, role-specific platform built using the MERN stack. Students can securely upload academic records and share notes, while faculty members can access and distribute study materials efficiently. The system emphasizes usability, responsiveness, and security while remaining cost-effective for academic institutions.

II. LITERATURE REVIEW

- The growth of digital learning environments has inspired a wide range of platforms to support academic file sharing, collaborative learning, and digital resource management. Google Classroom, Microsoft Teams, and Moodle are among the most popular systems, providing structured environments for course content delivery, assignment management, and student- faculty interaction. However, these platforms often require significant infrastructure and may not cater to the specific needs of institutions seeking lightweight, customizable, and cost-effective solutions.
- Recent studies (e.g., in IEEE Xplore and Elsevier) highlight the adoption of Learning Management Systems (LMS) in higher education, emphasizing accessibility, scalability, and collaborative potential. Cloud-based solutions offer ubiquitous access to educational resources, supporting remote and hybrid learning. Research also points out challenges such as data privacy, system complexity, and the digital divide.
- The MERN stack (MongoDB, Express.js, React.js, Node.js) has emerged as a modern web development approach, offering scalability, responsiveness, and modular design. Studies have shown that React-based frontends improve user experience and responsiveness, while Node.js backends enable asynchronous, high-performance data handling. MongoDB supports schema- less, flexible database design, making it suitable for academic portals handling unstructured documents.
- Existing literature also identifies inefficiencies in traditional paper-based systems and highlights the role of cloud-based repositories in reducing administrative overhead and ensuring secure document sharing. Several proposed systems aim to im- prove document management workflows, but few address the specific academic context of certificate management, student- faculty file sharing, and collaborative notes distribution in a unified platform.
- This project builds upon the strengths of LMS

platforms while focusing specifically on academic document management. By leveraging MERN technologies, it provides a scalable, secure, and intuitive solution tailored to students and faculty.

III. SYSTEM ANALYSIS

3.1 Problem Statement

- Traditional methods of managing academic documents such as marksheets, certificates, and lecture notes are highly inefficient. Students often share notes through informal channels (email, messaging apps), which leads to loss of data, lack of standardization, and accessibility issues. Faculty members face challenges in distributing materials and tracking submissions. There is a pressing need for a unified, secure, and easy-to-use platform.

3.2 Requirements Analysis

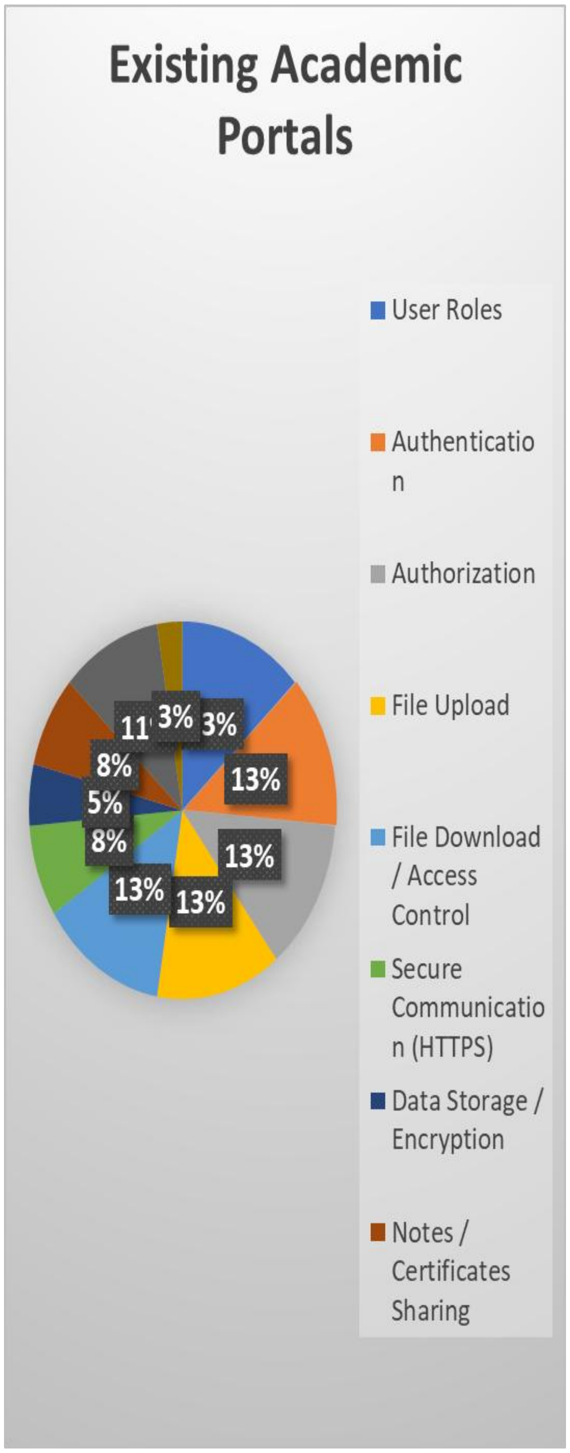
- The requirements are divided into Functional and Non- Functional requirements:
- Functional Requirements:
  - Student registration and authentication.
  - Faculty registration and authentication.
  - Uploading and downloading of academic files.
  - Semester-wise organization of documents.
  - Sharing of notes and study materials.
  - Faculty access to student submissions.
- Non-Functional Requirements:
  - System scalability to handle large numbers of students and files.
  - Security via authentication and authorization mechanisms.
  - Usability with a responsive and intuitive interface.
  - Reliability to ensure data persistence and backup.
  - Performance optimization for fast file upload/download.

3.3 Feasibility Study

Technical Feasibility: The MERN stack provides robust support for building scalable and interactive web applications. Economic Feasibility: The project leverages open-source technologies, minimizing licensing and infrastructure costs. Operational Feasibility: The platform addresses real needs of students and faculty, ensuring high adoption potential. Legal Feasibility: The system ensures compliance with data privacy and intellectual property rights.

IV. FIGURES AND TABLES

Feature / Aspect	Existing Academic Portals	Your Academic File Sharing Portal
User Roles	Mostly student-focused or faculty-focused	Both students and faculty with role-based access
Authentication	Username/password	JWT-based authentication for secure login
Authorization	Limited role-based access	Strict role-based access (student vs. faculty)
File Upload	Basic upload, limited validation	File validation by type and size; secure server-side checks
File Download / Access Control	Usually unrestricted within login	Controlled by role; students access own files; faculty access class submissions
Secure Communication (HTTPS)	Sometimes enforced	Enforced for all client-server communication
Data Storage / Encryption	Often plain storage or minimal encryption	Database encryption for sensitive fields and files
Notes / Certificates Sharing	Limited sharing, mostly view-only	Students can upload semester notes; faculty can share notes with class
User Experience	Generic interface	Role-specific interface with secure, organized file management
Advanced Security Measures	Rare	JWT authentication, role authorization, HTTPS, file validation, encrypted storage



V. PROPOSED METHODOLOGY

The Academic File Sharing Portal has been designed with modularity and scalability in mind. The system is divided into multiple modules, each handling specific functionality. The overall system is built on the MERN stack (MongoDB, Ex- press.js, React.js, Node.js), which ensures high performance, responsiveness, and scalability.

The methodology involves structured design, including architecture diagrams, data flow diagrams, use case diagrams, and ER diagrams to represent the logical and physical design of the system.

4.1 System Modules

1. Authentication Module: Handles secure login and registration for students and faculty.
2. Student Module: Enables students to upload marksheets, certificates, and notes.
3. Faculty Module: Provides faculty access to view/download student files and distribute materials.
4. File Management Module: Handles upload, download, update, and delete operations with validation.
5. Notes Sharing Module: Allows collaborative sharing of semester-wise notes among students.
6. Theme and UI Module: Provides light/dark mode and responsive design using React-Bootstrap.

VI. IMPLEMENTATION

The implementation of the Academic File Sharing Portal is carried out using the MERN stack, which consists of MongoDB, Express.js, React.js, and Node.js. Each component of the stack plays a crucial role in ensuring the efficiency, scalability, and responsiveness of the system.

5.1 Frontend (React.js with React-Bootstrap)

- The frontend is built using React.js, which provides a component-based architecture for developing reusable UI elements. React-Bootstrap is used for responsive design, ensuring accessibility across desktop and mobile devices. Features include theme toggling (light/dark mode), semester-wise navigation, and user-friendly dashboards for both students and faculty.

5.2 Backend (Node.js and Express.js)

- The backend server is developed using Node.js, which supports asynchronous, event-driven programming, making it highly scalable. Express.js is used to define RESTful APIs for handling user authentication, file uploads/downloads, and communication with the database. Middleware ensures secure request processing.

5.3 Database (MongoDB)

- MongoDB is chosen as the database for its flexibility in handling unstructured data such as notes, certificates, and marksheets. Collections are designed for Users, Files, and Notes. Schema-less design allows easy updates as new file categories emerge.

5.4 Deployment

- The system is designed to be deployed on cloud hosting platforms such as Render, AWS, or Microsoft Azure. The frontend and backend are containerized using Docker to ensure portability and scalability. CI/CD pipelines can be implemented to automate testing and deployment.

5.5 Security Measures

- To protect academic data, multiple layers of security are implemented:
- Authentication via JWT (JSON Web Tokens)
  - When a student or faculty logs in, the server generates a JWT token containing their user ID and role.
  - This token is sent to the client and stored (usually in local storage or session storage).
  - For every request (like uploading or downloading a file), the client includes the JWT in the Authorization header.
  - The server verifies the token to confirm the user's identity before processing the request.
- Implementation in your portal:
  - Students and faculty can only perform actions if they have a valid JWT.
  - Example: Only a logged-in student can upload their semester marks; only a faculty member can access all student submissions.
- Authorization for Role-Based Access
  - Your system has two roles: Student and Faculty.
  - After verifying the JWT, check the user's role before allowing access to certain routes or actions.
- Examples in your portal:
  - Students can upload semester marks, certificates, and view notes for their class.
  - Faculty can view all students' submissions, send notes, and manage files for the class.
  - Students should not access other students' files or modify faculty notes.
- File Validation and Size Restrictions
  - Before uploading, check the file type and size on both client and server sides.
  - Only allow acceptable file formats (e.g., PDF, DOCX, JPG) and set a maximum size (e.g., 10 MB per file).
  - Reject files that don't meet criteria to prevent malicious uploads.
- Implementation in your portal:
  - Use server-side validation in Node.js before saving files to MongoDB.
  - Client-side alerts help users avoid upload errors.
- HTTPS for Secure Communication
  - Use HTTPS to encrypt all data between clients and your server.
  - Prevents interception of sensitive information like JWT tokens, student records, and uploaded files.
- Implementation in your portal:
  - Use an SSL certificate (Let's Encrypt or commercial) on your Node.js server.
  - Force all requests to redirect from HTTP to HTTPS.
- Database Encryption and Backups
  - Encryption**:** Store sensitive fields (like student personal info or uploaded files) encrypted in MongoDB. Use libraries like Mongoose encryption or bcrypt for passwords.
  - Backups**:** Schedule regular backups of your MongoDB database to prevent data loss.
- Implementation in your portal:
  - Student submissions, certificates, and grades are encrypted in the database.
  - Regular automated backups ensure data can be restored in case of accidental deletion or system failure.

VII. RESULTS AND DISCUSSION

- The Academic File Sharing Portal provides several advantages compared to existing systems such as Google Classroom, Microsoft Teams, and Moodle. It is lightweight, customizable, and specifically designed for academic file management rather than general-purpose course management. The portal was tested with student and faculty users, and the results demonstrate improved usability, faster file access, and reduced administrative effort.

6.1 Comparison with Existing Systems

Benefits

The benefits of the system include:

- Reduced administrative overhead by digitizing

document workflows.
- Easy access to academic resources by both students and faculty.
- Semester- wise organization to improve file retrieval efficiency.
- Enhanced collaboration through notes sharing.
- Security features ensuring data privacy and controlled access.

VIII. CONCLUSION AND FUTURE WORK

The Academic File Sharing Portal successfully addresses the inefficiencies associated with traditional methods of man- aging academic documents. By leveraging the MERN stack, the system provides a responsive, secure, and user-friendly platform for both students and faculty. Key contributions of the system include structured semester-wise file management, collaborative notes sharing, and a lightweight architecture that is easily deployable.

The portal enhances accessibility, reduces administrative workload, and fosters collaboration in academic environments. Compared to existing systems, the proposed solution is highly customizable and focused on academic file management rather than general course delivery.

Future work could involve integrating advanced features such as:
- AI-based recommendation of notes and study materials. Automated plagiarism detection in uploaded files.
- Mobile application development for Android and iOS plat- forms.
- Enhanced analytics dashboards for faculty to monitor student progress.
- Integration with blockchain for secure credential verification.

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