College Resource Management System (MERN Stack)

1. Introduction

The College Resource Management System is a MERN stack based web application designed to manage and allocate college resources such as classrooms, laboratories, seminar halls, and equipment using a centralized digital platform.

2. Purpose

The purpose of this system is to replace manual resource booking, reduce conflicts, and ensure efficient and transparent utilization of college resources.

3. Technology Stack

1. MongoDB – Database
2. Express.js – Backend framework
3. React – Frontend library
4. Node.js – Server runtime

4. Architectural Principles (StackTrack Reference)

1. Database-first design
2. Backend controls business rules
3. Centralized authentication and authorization
4. REST API based communication

5. User Roles

1. Admin: Manages resources and approvals
2. Faculty: Requests and monitors resources
3. Students: Requests available resources

6. Core Features

1. Resource management and scheduling
2. Request and approval workflow
3. Real-time availability tracking

4. Usage history and logs

7. Backend Design

The backend is developed using Node.js and Express.js. It provides versioned REST APIs and handles authentication, role-based access control, and data validation.

8. Frontend Design (React)

The frontend is built using React with functional components, hooks, and context for authentication and state management.

9. Security

1. JWT-based authentication
2. Role-based authorization at backend
3. Secure and validated API endpoints

10. Conclusion

The College Resource Management System implemented using the MERN stack offers a secure, scalable, and efficient solution for managing college resources while following industry-style architecture principles.