# Smart Academic Project Vault

DR. FATHIMA G #1, ASHWIN M #2, DARSHAN N #3

#1 Professor, Adhiyamaan College of Engineering (An Autonomous Institution), Hosur

#2,3 UG Students, Adhiyamaan College of Engineering (An Autonomous Institution), Hosur

## ABSTRACT

In academic institutions, repetitive project submissions and ownership conflicts among students have become a growing concern, particularly during final-year and mini-project evaluations. To address this issue, this project proposes the development of a real-time Project Registration and Ownership Verification Platform—a centralized system for registering, validating, and managing student project ideas across departments. The platform allows students to officially register their project proposals, which are then reviewed by faculty members for approval and similarity verification. Upon successful validation, a digital certificate of ownership is issued to the student or team, ensuring exclusive rights to their project idea. The system stores all registered projects in a searchable, department-wise categorized repository that acts as a mini version of GitHub, preventing future duplication by providing transparency and accessibility.

## 1. INTRODUCTION

In academic institutions, project-based learning enhances students' technical and problem-solving skills but faces issues like duplication, lack of centralized storage, and ownership disputes—hindering innovation and fair evaluation. The **Smart Academic Project Vault** addresses these challenges by providing a centralized digital platform for project registration, faculty validation, and ownership verification, issuing digital certificates to ensure authenticity and originality. Furthermore, this platform provides a searchable and categorized repository of all approved projects, enabling future students to explore existing ideas, avoid repetition, and build upon prior work. By integrating features like digital validation, project categorization, and faculty review, the proposed system enhances academic transparency, encourages innovation, and simplifies project management within institutions.

## 2. LITERATURE SURVEY

[1] **R. Sharma and P. Verma (2021)** developed a *Web-Based Student Project Management System* for academic institutions. Their system provided an online platform to handle student project registration, submission, and evaluation.

The work emphasized the importance of centralized storage and automated workflows, reducing manual intervention and improving transparency between students and faculty. This research highlights how digitized project handling systems can streamline communication and ensure organized record management, which forms a foundation for the Smart Academic Project Vault.

[2] **S. Gupta and A. Singh (2020)** designed a *Final-Year Project Tracking and Registration Platform* that focused on online registration, progress tracking, and approval processes. The system enabled faculty to monitor student milestones and guide activities efficiently. Although it simplified project tracking, it lacked integrated verification and data validation features. This study demonstrates the value of implementing structured project workflows and continuous monitoring, which are integral components of Smart Academic Project Vault.

[3]    **M. Kumar et al. (2019)** conducted a *survey on Academic Project Management Systems and Ownership Verification*. They reviewed multiple systems and identified critical issues such as plagiarism, duplicate submissions, and missing ownership proofs. The authors emphasized the need for digital verification, secure authentication, and audit trails in academic project platforms. Their findings underline the necessity of including authentication and ownership verification modules—key aspects incorporated into Smart Academic Project Vault.

## 3.    METHODOLOGY

The methodology adopted for the **Smart Academic Project Vault** involves a systematic approach to designing, developing, and deploying a centralized web-based platform for managing academic project registration and ownership verification. The process is divided into multiple phases:

### a.    Requirement analysis

In this phase, both functional and non- functional requirements of the system are identified.

**Functional Requirements:**

i.    Student registration and login.

ii.    Project submission and proposal upload.

iii.    Faculty review and approval process.

**Non-Functional Requirements:**

i.    Data security and authentication.

ii.    User-friendly interface.

iii.    Scalability for multiple departments.

### b.    System design

The platform follows a **three-tier architecture**:

- **Frontend:** Provides the user interface for students, faculty, and admin.

- **Backend:** Handles logic for authentication, project validation, and data processing.

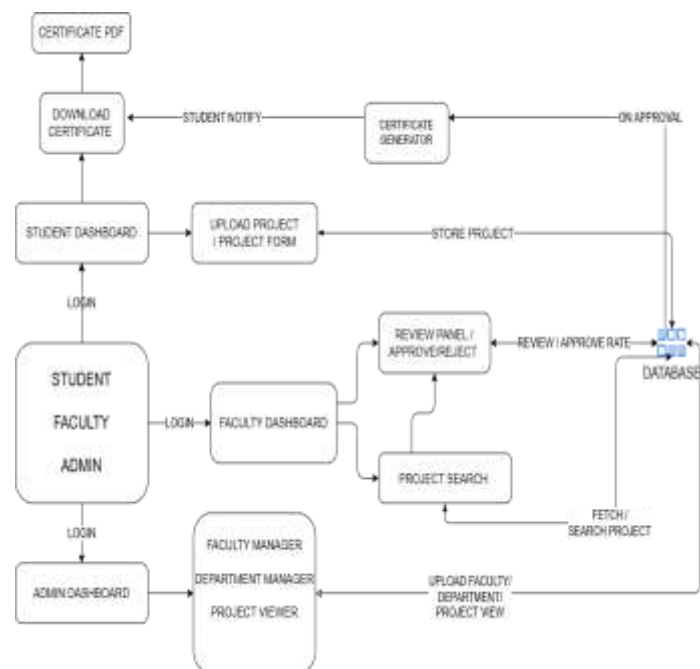- **Database:** Stores user data, project details, approval status, and certificates.



*Figure 1: Architecture Diagram*

**Technology Stack:**

- **Frontend:** React.js, Tailwind CSS (for responsive design)

- **Backend:** Node.js, Express.js

- **Database:** MongoDB (for dynamic and scalable data storage)

**Design Tools:**

- UML diagrams (Use Case, Data Flow, ER Diagram) are used to model interactions between users and the system.

### c.    Implementation

- **User Module:** Handles login, registration, and project submission.

- **Faculty Module:** Provides interfaces to review and approve submitted projects.

- **Admin Module:** Manages users, verifies ownership, and generates certificates.

### d. Verification process

When a student submits a new project proposal, the system first performs a similarity check by comparing keywords and metadata against existing projects in the repository. The assigned faculty member then reviews the submission to validate its originality and feasibility. Upon approval, the system automatically generates a digital ownership certificate containing the student's details, project title, and verification signature.

### e. Testing

Comprehensive testing was conducted to ensure the system's reliability and performance. Unit testing verified the functionality of individual components. Integration testing ensured seamless interaction between the frontend and backend

### f. Deployment and maintenance

The final system is hosted on a web server for institutional access.

- Deployment can be done on **Render**, **Vercel**, or **Heroku** (for the backend) and **MongoDB Atlas** (for database hosting).

- Continuous updates and maintenance are carried out to improve usability and security.

### g. Outcome

The implemented system ensures transparency, originality, and proper project ownership within the academic framework. It serves as a **mini version of GitHub** for college-level projects.

## 4. EXPERIMENTAL RESULTS

### a. Experimental Setup

The Smart Academic Project Vault system was designed, developed, and tested using the following setup:

i. Frontend: React.js with Tailwind CSS for building a responsive interface.

ii. Backend: Node.js with Express.js for handling business logic and routing.

iii. Database: MongoDB Atlas for secure and scalable cloud storage.

iv. Development Tools: Visual Studio Code, Postman, and Git for version control.

v. Browser: Google Chrome was used for UI testing.

vi. Operating System: Windows 10 environment.

vii. Deployment: Tested on localhost and hosted on Render for online access.

### b. Experimental Procedure

To evaluate system performance and functionality, the platform was tested by three types of users — **Student**, **Faculty**, and **Admin**.

### i. Student Module

Students register and log in to submit project details and track their project status (pending, approved, or rejected).

### ii. Faculty Module

Faculty members log in to review submitted projects, check for duplication, and update the project status upon approval.

### iii. Admin Module

The admin oversees the workflow, manages user accounts, verifies approved projects, generates ownership certificates, and maintains the project repository with search and categorization features.

### iv. Certificate Generation Test

Once a project was approved by a faculty member, the system automatically generated a certificate containing college name, project title, student details, and date of issue, and successful PDF will be downloaded.
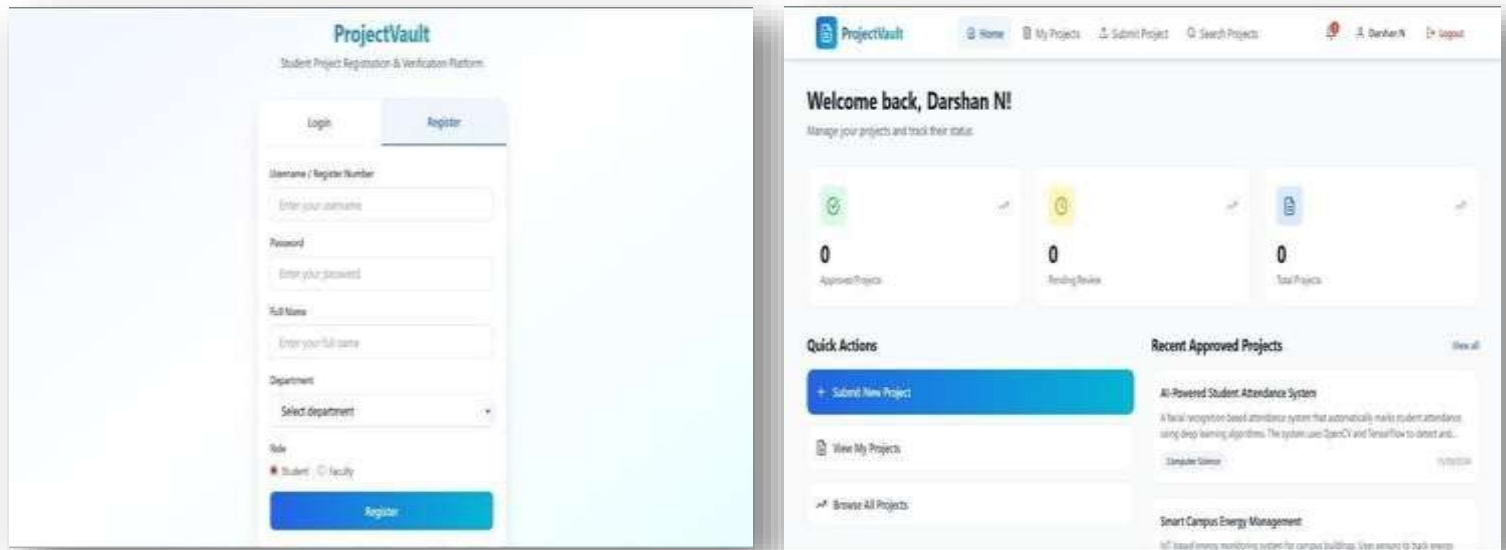
### c.     Observed Results



*Figure 2:Output Result*

all defined goals. The role-based system for Students, Faculty, and Admin ensures organized

After implementation, all core functions worked efficiently without major errors. Student authentication and project storage were successful, faculty review ran smoothly, and duplicate projects were accurately detected. Digital ownership certificates were auto- generated, and the repository's search successfully streamlined academic project management, transforming manual processes into an efficient and secure digital system.

## 5. DISCUSSION

The **Smart Academic Project Vault** is a centralized web-based platform designed for project submission, review, and ownership verification. It efficiently handled registration, login, submission, and certificate generation during testing, meeting

workflow and accountability. Students found the submission process simple and appreciated features like status tracking and automatic certificate generation. Faculty benefited from a clear review dashboard, plagiarism checks, and transparent evaluation, while Admins could easily manage users, projects, and certificates through a centralized dashboard.

Performance tests showed fast response times and scalability, thanks to the MERN architecture and MongoDB's flexible data handling. Security was ensured through hashed passwords and JWT authentication. Compared to manual methods, the system greatly reduced paperwork, confusion, and time, while adding transparency and digital ownership verification.

Some limitations include lack of large file uploads, basic keyword-based plagiarism checks, missing email/SMS notifications, and limited admin analytics. Despite these, theplatform promotes originality, transparency, and collaboration, serving as a digital project repository and learning hub. Overall, the Smart Academic Project Vault.

## 6. CONCLUSION

The **Smart Academic Project Vault** successfully achieves its objective of creating a centralized, secure, and transparent platform for managing student project submissions and ownership verification. By integrating students, faculty, and administrators into a single digital environment, the system eliminates the recurring issues of project duplication, ownership disputes, and disorganized submissions commonly faced in academic institutions.

The implementation of the system using **MERN Stack (MongoDB, Express, React, Node.js)** has proven to be efficient in terms of speed, scalability, and ease of use. The platform's user- friendly interface enables smooth interactions for all users, while the backend ensures data integrity and authentication.

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