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ProjecxHub: A Project Showcase App



UNIVERSITY OF ENGINEERING & MANAGEMENT,
JAIPUR

ProjecxHub: A Project Showcase App

Submitted in the partial fulfillment of the degree of

BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE & ENGINEERING

Under

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

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UNDER THE GUIDANCE OF

PROF. DEBAJYOTI CHATTERJEE

COMPUTER SCIENCE & ENGINEERING



UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Approval Certificate

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Ankshika Ghosh
Anshu Kumar
Supratim Modak

ABSTRACT

The ProjexHub: Project Showcase App is a digital platform for college students and company employees to upload, store, and display their innovative projects. Users can create profiles and share project details such as titles, descriptions, member names, photos, videos, PPTs, and report files. The main goal was to build a strong, scalable, and efficient application from a common code base. This approach cuts down development time and makes maintenance easier. The system uses Flutter for the frontend and Node.js with MongoDB for the backend, which is known as the FMN stack. We chose Flutter for its hot-loading feature and speed, providing near-native performance and high-quality UIs for both Android and iOS from a single code base. We selected Node.js with the Express.js framework to create the RESTful API because of its asynchronous and non-blocking design. MongoDB is a NoSQL database that allows for a flexible and schema-less data model. This flexibility is important for quickly testing application features. The app also includes secure authentication, cloud storage, media management, and project categorization. It allows users to explore, learn, and find inspiration from shared work, which promotes knowledge sharing and professional networking. The app increases the visibility of student and employee innovations while offering an easy interface for archiving and discovering projects.

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1. INTRODUCTION

The ProjexHub: Project Showcase App offers a single platform for people to store and display their project work online. In many academic and professional settings, project documents are spread across different devices or drives. This app solves the problem by providing an organized, searchable, and easily accessible storage space.

1.1. Problem Statement

Students and professionals often struggle to manage and share project work efficiently. Projects frequently exist in either distributed or decentralized locations so that they are stored away from others (locally on drives, or maybe in cloud storage folders and without any structure), making it very difficult to locate, compare, or formally review them. There is a lack of **centralized storage** where others can explore projects and learn from them. Additionally, a location for all projects, standardized and readily accessible for all, does not exist and remains a barrier for general transparency of features and assessment of quality. The project would work towards developing a system that centralizes project data in a singular thorough approach, while promoting simplifying the processes of project data storage and display.

1.2. Objectives of the Project

The Project Showcase system aims to achieve:

- Design an easy to use mobile app utilizing Flutter.
 - Implement backend APIs providing functionality to the system, using Node.js and MongoDB.
 - Create a safe and trustworthy database to store project files and metadata.
 - Allow users to upload projects which have attachments that include media and documents.
 - Create an indexed project repository that users can search, and the items be sharable.
 - Create a fair and trustworthy rating system, where projects can be rated by registered users using a quantifiable mechanism.
 - Increase project visibility to a larger user group to increase awareness and feedback.

1.3. Work Scope

The application may be used by different universities, organizations, or start-ups to organize all portfolio projects. This task covers the entire development life cycle, including:

- **Front-end Development:** Developing the user interface (UI) for viewing, searching, and rating projects.
- **Back-end Development:** Developing the application logic for handling user authentication, project submission, data validation, and rating calculation.
- **Database Management:** Development of a database schema that efficiently stores information on projects, users, and ratings.
- **Security:** Security of files and user data.

2. LITERATURE REVIEW

2.1. Existing Works

The currently available sites to share and collaborate on projects may be focused on overlapping but different audiences, but none was curtail within the context of academia or organizational project showcase. For example, GitHub is primarily focused on distributed version control and collaborative software development workflows each with the centralized focus on managing code with little emphasis on structuring documentation in multiple formats and show a project [1]. In contrast, Behance was an area for creative professionals showcase portfolios and virtually present a project and the process by which the project was developed; while engineering a project file, there is no operational means for technical project file sharing, versioning, and organizing academic metadata [2]. Separately, even though users may showcase their achievements and share projects outcomes on sites similar to LinkedIn; LinkedIn is not capable of keeping the initial project [3].

While students and project groups may sometimes use cloud drives like Google Drive to store project documents, these tools are not designed for structured project showcasing, public visibility, or validated user feedback mechanisms [4]. Flutter has emerged as a high-performance cross-platform framework capable of delivering unified mobile UIs, making it a suitable framework for building an application interface for a project showcase system [5]. And similarly, Node.js and Express.js enable developers to build scalable REST APIs that are effective at enabling data communication for web and mobile based systems [6]. Nonetheless, a means of integrating such technologies to provide secure showcasing, storing, and evaluation of academic or internal organizational projects is what is missing.

2.2. Research Gaps

Studies have repeatedly demonstrated that using collaborative tools enhances productivity and knowledge sharing in academic and workplace settings, especially when projects can be documented, accessed, and organized in an online space [7]. Most tools to date, however, do not present the ability to coexist in one working environment with organized project repositories, stored documents securely, and showcase the portfolio of projects with public access.

Another major issue is the existence of a system that allows for secure and authenticated user-based rating, using administrative controls that ensure user data is protected and not providing unsubstantiated or biased feedback [8]. While cloud storage systems do provide secure file transfer and management services, they do not provide structured metadata or contributor history, nor workflow control in the assessment of projects for academic purposes [9].

Thus, again, there is a need for a dedicated project showcase platform which is able to:

- Store any documentation, images, code, and all multimedia securely.
- Organize projects through metadata and contributor information.
- Disseminate project or semi-public showcase possibilities based on approvals.
- Contribute to authenticated rating/feedback systems that provide credentialing.
- Integrate collaborative and academic assessment on a usable platform.

The system being proposed in this project is designed to directly address these gaps and create a unified, secure showcase project ecosystem that aligns academic standards.

3. METHODOLOGY

3.1. Technologies

- Hardware Specifications:
 - Mobile Device: Android version 11 or later; Apple iOS 12 or later:
 - Internet Access: Required to use the API and gain access to the database.
- Software Specifications:
 - Flutter SDK - cross-platform mobile development tooltip
 - Dart - frontend logic and user interface
 - Node.js - server-side scripting
 - Express.js - generates a RESTful API
 - MongoDB Atlas - cloud-based NoSQL database
 - Multer - for uploading files (PDF, PPT, images, video)
 - JWT - for user authentication and session handling
 - Postman - API testing and debugging
 - Git & GitHub - version control
 - IDE: VSCode / Android Studio

3.2. System Design

- System Overview:
 - This is a client–server application structure with a Flutter front-end and a back-end with a Node.js + Express checkbox with a MongoDB database.
 - Users have the ability to register, log in, upload, and view projects (PDFs, PPT, videos, and images).
 - All information about the user and their projects is stored securely, and that data is later retrieved as a response from the RESTful APIs.
- Flow of the System:
 - The user opens the Flutter app and logs in safely.
 - The app will send authentication and request upload information to the Node.js

backend.

- Node.js will check the JWT tokens and receive the request.
- Multer will ultimately receive the uploaded files and store the uploaded files in their respective folders.
- MongoDB will log the URLs, user information, and project information.

4. DESIGN AND IMPLEMENTATION

4.1. Detailed design diagrams (block diagrams, flowcharts, etc.)

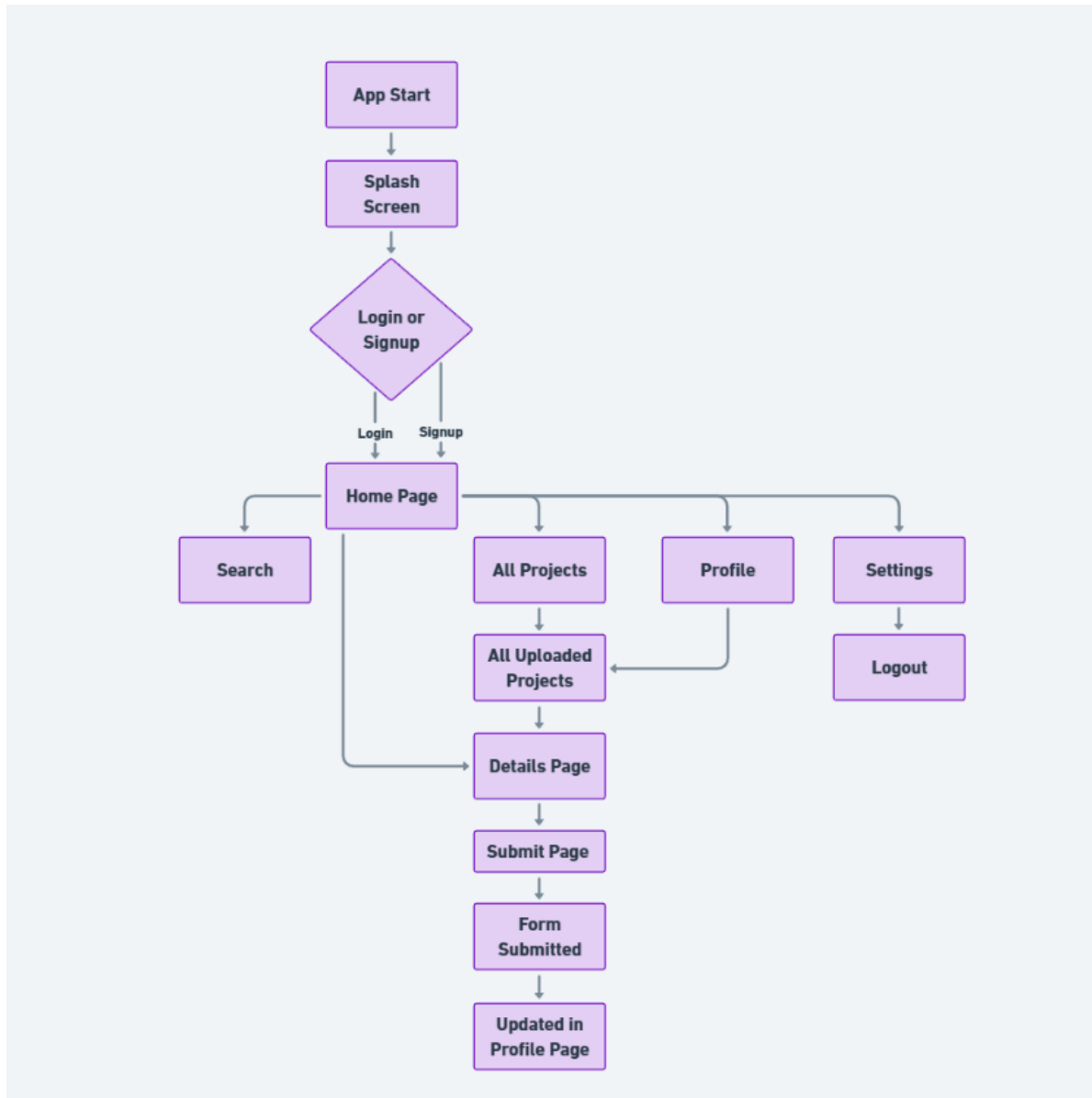


Figure 1.1 : Detailed flowchart of the application

The design consists of a simple, clean, and user-friendly interface that allows the visual presentation of projects to serve as the focal point. The detailed design consists of the basic screens and a few key features outlined below:

- Login/Signup page with Firebase Authentication.
- Project upload form that consists of fields for title, description, members, media, and files.
- Project gallery with search and filters.
- Project detail screen that will show links to download/view.

Flutter widgets were used for UI development. The speed with which the framework allowed us to access nearly native performance for Android and iOS from a single code base was crucial to the implementation. Node.js APIs empowered the backend logic and CRUD (Creating, Reading, Updating and Deleting) logic while MongoDB as a NoSQL database allowed the necessary schema-less data model flexibility required to iterate quickly in testing application features. The combination of the FMN stack provided performance and developer speed better than traditional development methodologies of native applications.

5. RESULTS & DISCUSSION

5.1. Testing and Experiments

Testing was performed on both the Android and web apps. Functional tests were conducted to confirm each of the upload, download, and authentication aspects of the applications worked as expected. Testing of the applications showed that interfacing between the Flutter front-end and the node.js/MongoDB back-end appears to be reliable and secure with regard to these important functions.

5.2. Result Analysis

The analysis of the results suggested the upload and retrieval of multimedia and documents worked without problems. The UI was internally rated with high usability. The system appears to have resolved all basic components of centralized storage and a working UI to explore projects and thus resolved the problem of messy project documentation.



Figure 2.1: Home Screen

Figure 2.2: Project Submit Form

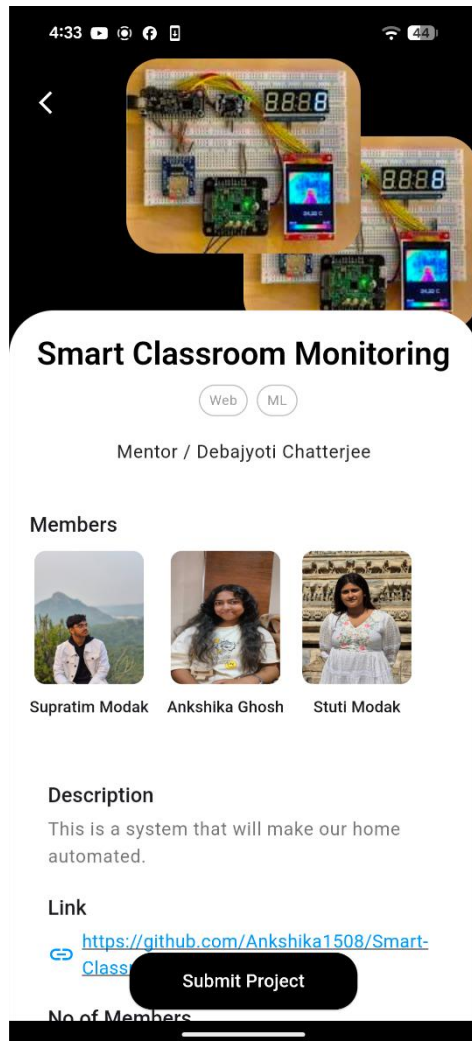


Figure 2.3: Projects Detailed Page

6. CONCLUSION & FUTURE SCOPE

6.1. Conclusion

The ProjexHub Application operates successfully as a digital tool for students, allowing all to collect in one place and upload, display and review thinking and engaging college projects.

It works to overcome the barriers put in place for communication with the students, faculty and evaluators through a single place for documents and reviews.

Using Flutter, Node.js, and MongoDB, the application can meant for performance across devices, scalability of the app and performance.

Authentication is protected using JWT to protect users so that only authorized users can upload and reuse the data.

It has the functionality for the user to also upload additional PDFs, PPTs, videos, and images in two formats, so it is a very versatile app for technical and creative projects.

In the end, the project has been successful in building a reputable user-friendly, secure, and manageable academic project zone for sharing and review.

6.2. Future Scope

- Admin Panel Integration: Build an admin dashboard functionality where your can review, edit or delete images or information have been flagged as inappropriate.
- Project Rating & Feedback System: Build in functionality for users and mentors to rate and provide comments on the project to help improve peer learning.
- Search and Filters: Build in filters for search for example by department/year or the technology being used.
- Cloud File Storage: The media will be stored on AWS S3 or other similar services for scalability.
- AI Driven Recommendation Engine: The application will use algorithms to recommend other related, or newsworthy, projects.
- Web Application: The application will be changed to a responsive web application so it can be accessed through a browser.
- Collaboration: Project teams will be able to communicate, update the project, and share

resources within the application.

- College Integration: The platform will be integrated with college portals or LMS systems to allow projects to be submitted and graded automatically.

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