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A Review on Project Triangle: A Student-Driven Marketplace for Academic Project Exchange

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Abstract : ***The rapid adoption of web-based technologies in academic environments has reshaped how students create, distribute, and utilize learning resources. A significant volume of technical work produced by students as part of their coursework remains dormant after evaluation, representing an untapped reservoir of practical knowledge. In many academic programs, students create technical projects as part of their coursework. However, after submission, most of this paper are rarely reused or shared, leading to a loss of valuable effort and knowledge.***

In this paper, we introduce Project Triangle, a web-based platform that allows students to upload, share, and even earn from their academic projects. The system connects two main users: students (project creators), and buyers or learners (who need project resources). This platform helps students showcase their work by getting credit points as reward by which they can buy other projects.The main goal of this system is to make academic projects more accessible while encouraging students to benefit from their skills and creativity.

Keywords: Academic Marketplace, Project Sharing Platform, Student Innovation, Knowledge Sharing, System.

I. INTRODUCTION

The integration of web technologies into academic institutions has opened new avenues for knowledge creation and skill development. Engineering and computer science students, in particular, invest considerable time and effort in developing project-based solutions as a compulsory component of their degree programs. Such projects serve as hands-on demonstrations of how theoretical concepts translate into working systems, sharpening both analytical thinking and technical execution. Once a project is evaluated and graded, it typically reaches a dead end — archived on a student's laptop or an institutional server with no structured path toward reuse. This cycle results in repeated reinvention of similar solutions across batches, while accumulated student innovation goes unacknowledged and inaccessible to the wider academic community. At the same time, many students face difficulties in finding proper guidance, project ideas, or implementation references when working on their own projects. Although various online platforms provide study materials, tutorials, and courses, there is still a lack of a dedicated system that allows students to share complete academic projects in a structured and accessible manner. Additionally, students who possess strong technical skills do not have enough opportunities to showcase or monetize their work.

Another important issue is the gap between academic learning and real-world application. Many students' complete projects only for academic submission without understanding how their work can be useful beyond the classroom. If these projects were properly organized and shared, they could act as valuable learning resources for other students and even serve as a foundation for further development or innovation.

Moreover, with the increasing use of digital platforms, there is a growing need for systems that not only store information but also make it easily searchable, reliable, and user-friendly. A platform that integrates project sharing with verification and collaboration can significantly improve the learning experience and promote practical knowledge exchange among students.

To address these challenges, this research introduces Project Triangle, a web-based platform designed to create a centralized marketplace for academic projects. The system focuses on improving accessibility, encouraging collaboration, and providing students with recognition and potential financial benefits. By connecting students, institutions, and users, the platform aims to create a meaningful ecosystem where academic work is not only preserved but also continuously utilized and improved.

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II. LITERATURE REVIEW

Sr no.	Authors (Year)	Methodology	Limitations
1.	Chaurasia et al. (2025)	Designed a student-focused e-commerce platform integrating academic services and peer-to-peer selling.	Lacks integrated features
2.	Ahmed et al. (2024)	Developed a localized marketplace tailored to campus-level needs using region-specific customization.	They are not fully designed for students.
3.	Kumar & Singh (2023)	Created a web-based knowledge-sharing system supporting user-generated educational content.	Interaction between users (like collaboration or communication) is often limited.
4.	Patel & Shah (2022)	Built a freelancing platform for technical services with bidding and service listings.	Not focused on academic's project.
5.	Wang et al. (2023)	Built an online educational marketplace system with structured course/product listings and transactions.	Some platforms may face performance issues as the number of users increases.
6.	Mozahem (2021)	Analyzed how online learning platforms support knowledge sharing and student engagement through digital tools and interactive features.	Does not support project uploading or file-based sharing systems.
7.	Garcia & Torres (2024)	Proposed a collaborative digital learning ecosystem combining content sharing and peer interaction.	Many systems do not support uploading and sharing complete projects or files.
8.	Sharma et al. (2023)	Implemented a collaborative learning platform emphasizing group-based knowledge exchange.	Security features like proper authentication are not always strong.
9.	Rahman et al. (2022)	Designed a community-driven platform for digital knowledge sharing using social interaction models.	Monetization systems are not flexible for users.
10.	Li & Zhao (2023)	Developed a knowledge monetization platform enabling users to sell digital learning resources.	File storage and management are not handled efficiently in many cases.

Table. 2.1 Literature review table

Recent studies highlight the growing importance of digital platforms in improving access to academic resources and enhancing collaborative learning among students. Various systems have been developed to enable the sharing of study materials, project resources, and technical knowledge through structured online environments. For instance, student-centered marketplaces and localized e-commerce platforms have made it easier for learners to exchange educational content and support each other's learning process. Similarly, knowledge-sharing communities and collaborative platforms have been effective in promoting peer-to-peer interaction and improving the overall learning experience. In addition, monetization platforms have introduced new opportunities for individuals to showcase their skills and earn through digital content and technical services. These approaches collectively demonstrate how technology can bridge the gap between knowledge creation and its practical use. However, most existing solutions primarily focus on sharing study materials or tutorials, rather than complete academic projects. This indicates a clear need for a more specialized system that integrates project sharing, verification, and collaboration in a single platform, which forms the basis for the proposed Project Triangle system.

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III. PROBLEM STATEMENT

Despite the rapid growth of digital learning platforms, there are several challenges associated with academic project management and sharing. Firstly, there is no centralized platform where students can upload and access complete academic projects. Most available resources are scattered across different websites, making it difficult for students to find reliable and structured content.

Secondly, lack of accessibility to real-world project implementations creates a gap between theoretical learning and practical understanding. Students often rely on incomplete tutorials or outdated materials, which limits their ability to build high-quality projects.

Another major issue is that student efforts are not utilized effectively. After submission, projects are rarely reused, resulting in wasted knowledge and innovation. Many valuable ideas remain unexplored and inaccessible to others.

Additionally, there is limited opportunity for students to earn or gain recognition from their academic work. Skilled students who can develop projects do not have a proper platform to showcase their abilities or offer their services.

Lastly, concerns related to project authenticity and plagiarism also exist. Without a proper verification system, it becomes difficult to ensure the originality and reliability of shared content. These challenges highlight the need for a structured system that not only stores academic projects but also makes them accessible, reliable, and beneficial for a wider audience.

IV. PROPOSED SYSTEM

The proposed system is a web-based platform that allows users to easily buy and sell academic or development projects in a simple and organized way. Users can register, log in, and explore available projects through different sections like Explore, Sell, and Dashboard. Sellers can upload their projects with basic details and files, which become visible to all users. Buyers can browse these projects and purchase them directly through the platform. The system focuses on making the entire process smooth, user-friendly, and accessible for students and developers.

On the backend, the system uses a structured API layer to handle all operations such as authentication, project management, and purchases. Data like user details, project information, and sessions are stored in a JSON-based database, while uploaded files are saved securely in file storage. Each action from the frontend is processed through APIs and backend logic to ensure proper flow and data handling. Overall, the system is designed to be simple, efficient, and easy to understand, while maintaining a clear separation between frontend, backend, and storage components.

V. METHODOLOGY

The development of Project Triangle follows a layered approach in which each part of the system is responsible for a specific task. The overall structure is divided into four main layers: frontend, API handling, authentication, and data storage. These layers are connected in a systematic way to maintain clarity, improve scalability, and ensure smooth communication throughout the system. The frontend is built using React and provides a simple and interactive interface for users. It includes main sections such as Explore, Sell, and Project, allowing users to browse, upload, and view projects easily. On the backend, different functionalities like user authentication, project management, and transaction handling are managed through structured APIs, ensuring that each operation is handled efficiently without affecting other parts of the system.

An authentication layer is used to verify users before allowing access to any feature, which helps in maintaining security across the platform. For storage, user data and project details are managed in an organized manner, while uploaded project files are stored separately for better handling. This separation improves system performance and keeps the overall platform well-structured and reliable.

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VI. SYSTEM ARCHITECTURE

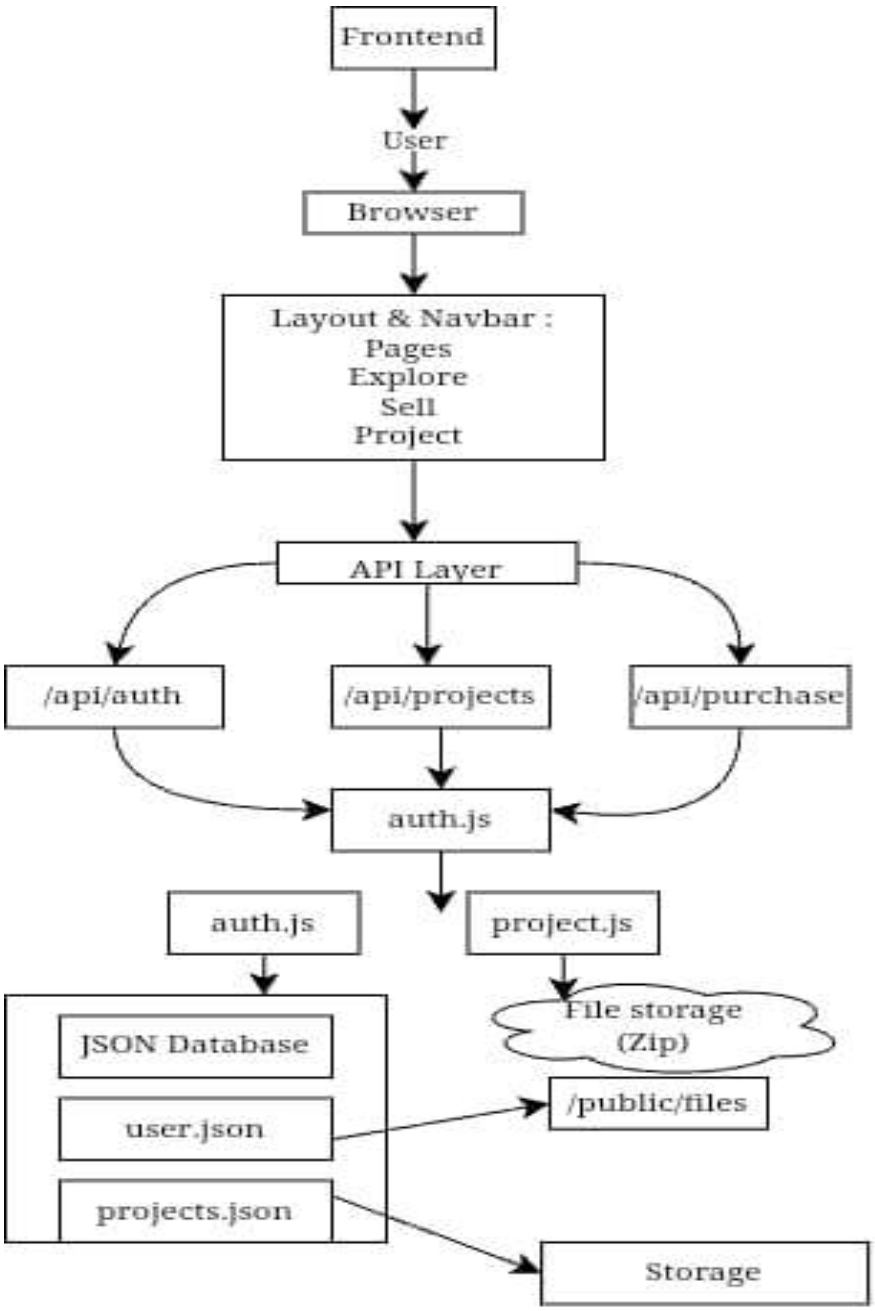


Fig. 6.1 System Architecture of the Project Triangle

The diagram represents a simple, hand-drawn system architecture of your project marketplace application, designed to show the flow in an easy and understandable way. At the top, the user interacts with the system through the browser, which connects to the frontend section. This frontend includes the layout and navbar, along with main pages like Explore, Sell, Project, and Login/Register. These pages act as the entry point where users perform actions such as browsing projects or uploading their own work. From here, every user action is passed down to the API layer, which works like a bridge between the frontend and backend, ensuring that requests are properly handled that, the backend processes these requests using different API routes such as authentication, project management, and purchases. These routes connect to logic files like auth.js and projects.js, where the actual processing happens, such as verifying users or handling project uploads. After processing, the data is stored in a JSON database, which keeps records like users and projects, while the uploaded files (like ZIP projects) are stored separately in file storage.

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VII. FUTURE WORK

Although the proposed system provides a strong foundation, several improvements can be implemented in the future to enhance its functionality and performance.One possible enhancement is the integration of Artificial Intelligence (AI) for personalized project recommendations. This would help users find relevant projects based on their interests and previous activity.

Another improvement could be the addition of automated plagiarism detection tools, which can further ensure the originality of uploaded projects and maintain platform credibility.

The platform can also be expanded by introducing a mobile application, making it more accessible and convenient for users.

Additionally, implementing advanced analytics can help track user behavior, popular project categories, and overall platform performance.Integration with cloud storage and version control systems can also improve project management and allow users to maintain updated versions of their work.In the future, the system can be scaled to include international users, creating a global academic project-sharing ecosystem.

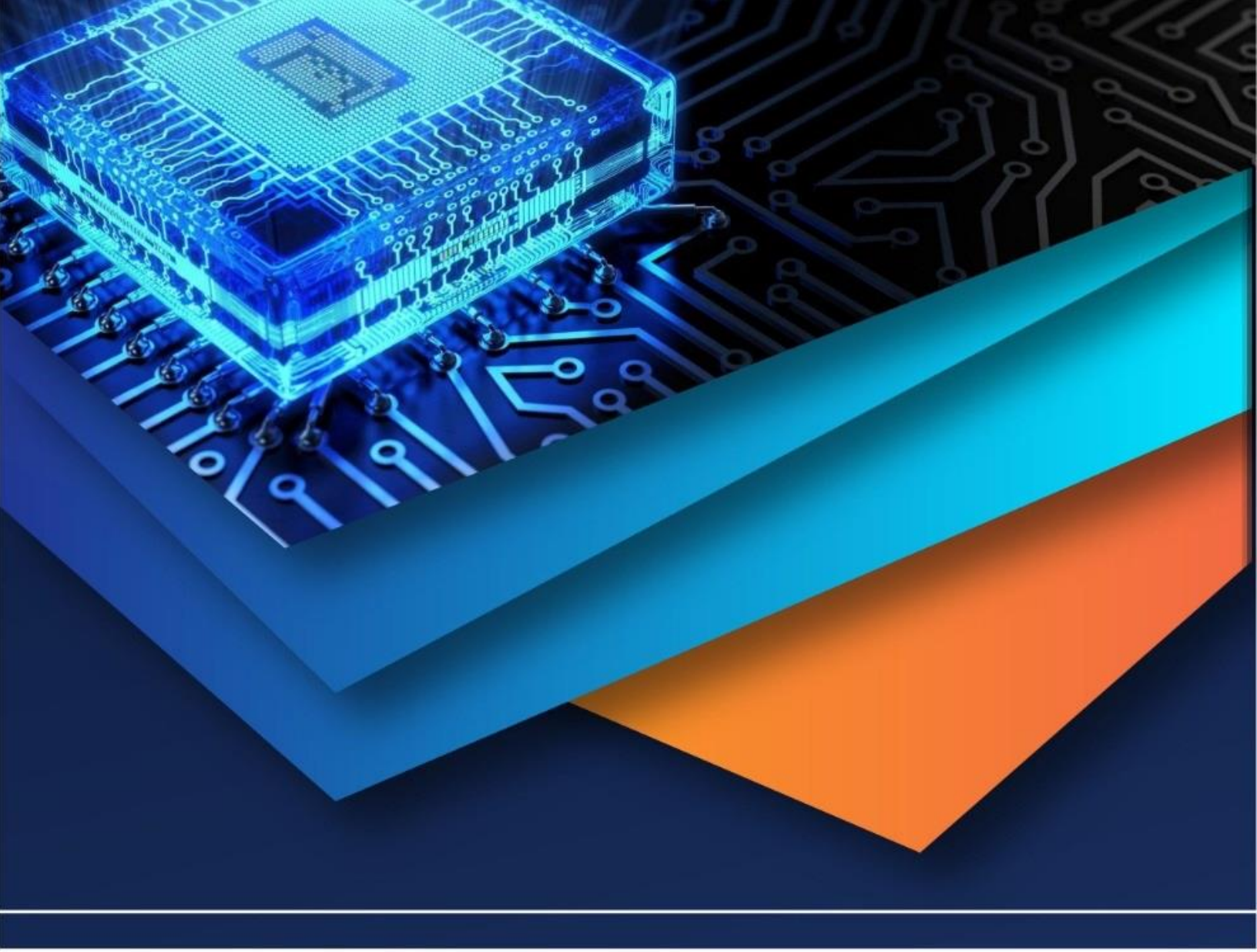
VIII. CONCLUSION

This research presents Project Triangle, a web-based platform designed to address the limitations of current academic project management systems. The study highlights the lack of centralized access, limited knowledge sharing, and underutilization of student efforts in existing systems.The proposed solution provides a structured marketplace where students can upload, share, and monetize their academic projects. By connecting students, institutions, and users, the platform promotes collaboration, improves accessibility, and enhances practical learning.The system also introduces features such as credit points as reward, user feedback mechanisms, which contribute to its reliability and effectiveness.Overall, Project Triangle has the potential to transform how academic projects are utilized by turning them into valuable learning resources and opportunities for skill development. It not only supports students in their academic journey but also helps bridge the gap between education and real-world application.

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