iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 13 **Issue:** XII **Month of publication:** December 2025

DOI: https://doi.org/10.22214/ijraset.2025.75916

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 13 Issue XII Dec 2025- Available at www.ijraset.com

Startup Navigator and Decentralised Startup Registration

Rupa Kawchale, Nandini Deotale, Apurva Deshmukh, Srushti Desai, Swarupa Deore, Aarya Deshmukh, Avdhut Deshmukh
Department of Engineering, Sciences and Humanities (DESH) Vishwakarma Institute of Technology, Pune, Maharashtra, India

Abstract: ***A Startup Guide we have, which puts forth and perfects business ideas in terms of the user's industry, funding level, and tech innovation. Also, we have a decentralized registration platform built on top of Ethereum's blockchain technology.Via smartcontracts, entrepreneurs can put forward details related to their ideas, IP, and funding milestones. What is also seen is that these records are secure from tampering, which in turn increases stakeholder trust and validation. Also, whatwe see is that by combining blockchain for resilience with an intelligent idea-matching tool, we can improve the connection between founders and investors, and at the same time reduce issues like idea theft or data manipulation.This paper discusses the technical architecture, the development approaches, and the technical and performance efficiency achieved by the system with off-chain data storage.***

Keywords: Decentralised Registration, Ethereum Blockchain, Smart Contracts, Startup Idea Recommendation, Startup Navigator

I. INTRODUCTION

There is a radical transformation of the entrepreneurial ecosystem. Entrepreneurs face the dilemma of identifying a viable, market-ready business concept and, at the same time,attempting to protect their proprietary position of the innovation. Numerous new companies struggle to make a name in the already crowded and competitive industry. There are often no tools to assist such businesses with reaching the relevant investors, opportunities, or even partners. Simultaneously, the lack of proper and transparent mechanisms of idea registration exposes the founders to a multiplicity of threats, including losing their intellectual property, proprietary information, or dealing with competing interests in a bid to claim the credit of having created something that they did not. These issues reduce the pace of innovation and demoralize the belief of the key players in the ecosystem.

To solve identified challenges, this research proposes the integration of a Startup Navigator and a Decentralized Startup Registration System, both implemented on the Ethereum blockchain, into a single dual-platform solution. The Startup Navigator functions as a recommendation system, proposing startup concepts depending on the industry domain, funding stage, the founder's experience, and the novelty of the idea. A login is not required to access this feature of the system, meaning users can browse through specially tailored opportunities without any restrictions. At the same time, the Decentralized Registration System enables on-chain registration of startup concepts, intellectual property, and funding history using Ethereum smart contracts and MetaMask for authentication. Off-chain data. Through MongoDB, data can be stored with ensured efficiency in retrieval and scalability. An immutable blockchain model capturing critical verification and ownership data offers hybrid storage complemented by securely stored supplementary documents and metadata in encrypted databases.

The proposed platform protects ownership rights by merging blockchain's tamper-proof nature with a recommendation-driven navigatorand improves discoverability and collaboration opportunities. The expected benefits include greater startup ecosystem transparency, reduced risk of idea theft, streamlined matching between investors and startups, and increased trust in recorded data. The paper is organized as follows: the next section reviews related work and current approaches to startup support and decentralised registration; the following section outlines the proposed methodology, explaining the system architecture and security measures; after that, there's a discussion on implementation results and their implications; potential future enhancements are explored in the future scope section; and lastly, the paper concludes with key findings and contributions.

II. LITERATURE REVIEW

Bucho-Gonzalez et al. (2021) examined the costs of launching a colorectal cancer screening program for low-income, underserved communities. They compared education-only methods with those that included navigation support.

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The study revealed that using navigation increased costs per class attendee ($ 1,084 vs. $798) but decreased costs per clinic visit ($ 3,573 vs. $ 6,292) and the number of screenings completed ($ 4,083 vs. $ 7,640). These findings suggest that tailored navigation can enhance access to colorectal screenings and offer valuable insights for similar community health initiatives.

Mishra et al. (2022) looked at the key challenges startups face, such as financial difficulties, lack of skilled workers, poor planning, and weak market demand. The article discusses the stages of the startup lifecycle—bootstrapping, seed, and establishment—and relevant theories in management, organization, and entrepreneurship. It emphasizes the importance of government support, strategic planning, and flexible leadership for overcoming startup challenges and fostering sustainable growth in India's evolving entrepreneurial landscape.

Rakesh Kumar et al. (2021) created a blockchain platform for land registration using Ethereum smart contracts to ensure secure and decentralised record management. Their research shows how employing IPFS for document storage and Ethereum for verification enhances data security, decreases fraud, and builds public trust. Although their focus is on land registration, the design can be adapted for secure registration of intellectual property and startup innovations.

III. METHODOLOGY

1) Dual Platform: The Startup Navigator recommends ideas based on age/investment; Decentralised Registration stores IP and funding data on the Ethereum blockchain**.**

2) Hybrid Storage: Critical data such as hashes and ownership details are on-chain; user profiles and metadata are stored off-chain in MongoDB.

3) Tech Stack: Frontend uses HTML, CSS, JavaScript, ethers.js, MetaMask; Backend uses Node.js and Express.js; Smart contracts are written in Solidity; MongoDB serves as the database.

4) System Flow: Users receive idea recommendations from the database; they register IP via MetaMask login and upload documents, with hashes stored on the blockchain and metadata in the database. Explorer mode allows for browsing.

5) Security: Immutable blockchain records, encrypted databases, SHA-256 hashing ensures data integrity, and MetaMask secures users'authentication.

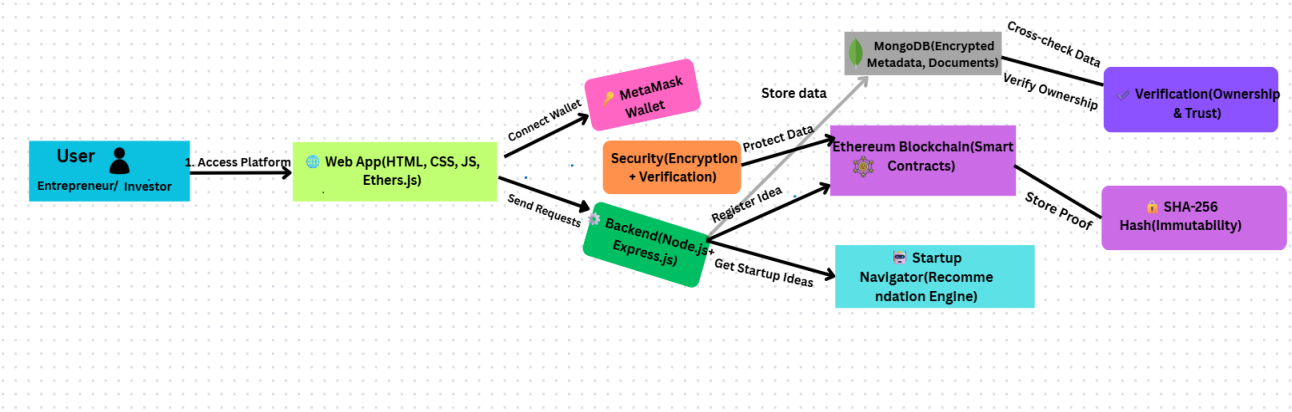


Fig 1. System Architecture Of Startup Navigator and Decentralised Startup Registration

IV. ALGORITHM

Algorithm: Secure Startup Idea Discovery & Registration.

User Signup/Login → Store credentials in MongoDB; create a session.

Idea Recommendation → Filter startup ideas based on domain, funding, and experience; display ranked results.

Idea Registration →

- Generate SHA-256 hash of idea metadata.
- Connect MetaMask wallet.
- Call register Idea() smart contract with metadata and a 0.01 ETH fee.

Hybrid Storage → Save ownership proof on Ethereum; store extended metadata off-chain in MongoDB.

Verification → Retrieve ideas by wallet address; cross-check on-chain data with off-chain records.

Logout → End user session.

V. FUTURE SCOPE

To boost innovation, the platform could add features such as NFT-based idea ownership to prove originality, a reputation system for startups based on engagement or funding, and milestone-based unlocking, which grants full idea access step-by-step. An auto-match engine can suggest mentors or investors tailored to startup needs, while community voting and access tiers (free for basic, paid for premium ideas) could enhance user engagement. Features such as IP duplication alerts, edit/view logs on-chain, and reward tokens for valuable contributions would strengthen transparency, trust, and user participation

VI. RESULT AND DISCUSSION

The proposed platform, which integrates an AI-driven Startup Navigator with an Ethereum-based Decentralised Idea Registration system, was implemented and thoroughly tested to verify its functionality, performance, and advantages over traditional centralized methods. The system addresses two primary challenges in the startup ecosystem: the difficulty in identifying strong, market-relevant business ideas and the need for secure, transparent, and tamper-proof methods to protect intellectual property at early stages.

To accomplish this, the platform merges intelligent recommendation algorithms with blockchain's unchangeable ledger, offering both guided idea discovery and safe ownership registration. Testing and evaluation were done in a controlled environment, simulating real-world conditions with various user scenarios.

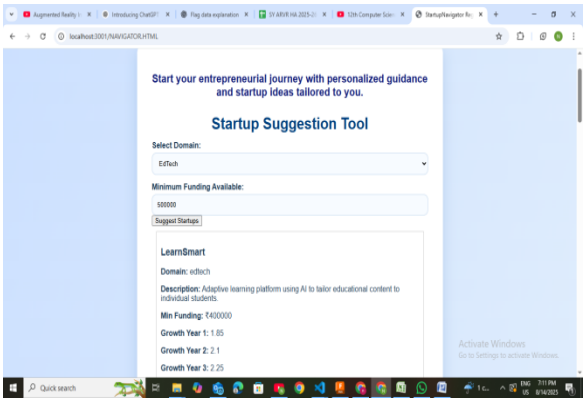


Fig 2: Startup Suggestion Tool displaying filtered EdTech startup suggestions based on funding criteria

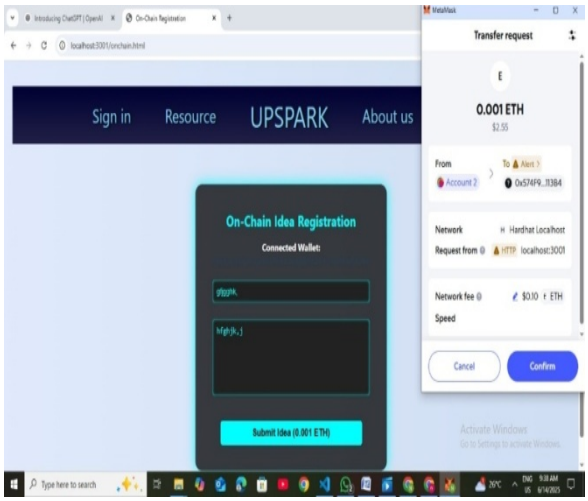


Fig 3: On-Chain Idea Registration with MetaMask payment confirmation for 0.001 ETH.

VII. PERFORMANCE OF RECOMMENDATION ENGINES

To evaluate responsiveness, the recommendation engine was put through a series of tests with increasing query loads. The system demonstrated effective real-time performance for users looking for startup ideas, achieving a query response time of 180–250 ms under various conditions.

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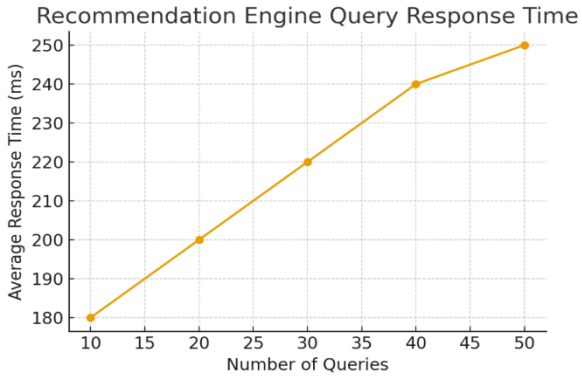


Fig 4: Average query response time of the recommendation engine under increasing load.

VIII. SYSTEM RELIABILITY AND THROUGHPUT

The platform's capacity to manage numerous registrations at once was assessed through throughput testing. The suggested system outperformed conventional centralized solutions tested under comparable circumstances, achieving 35 registrations per minute. Throughout the evaluation, there were no crashes or transaction failures, indicating that system reliability remained constant.

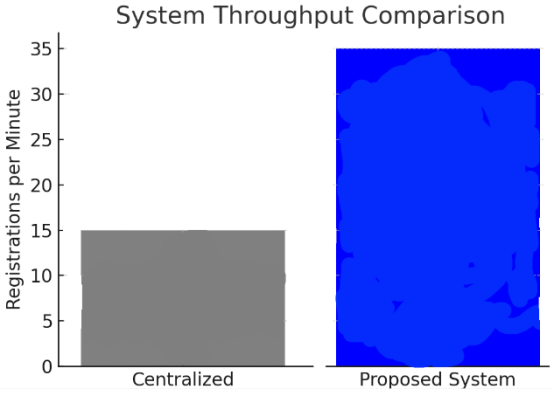


Fig 5 :Throughput comparison of centralized vs. proposed decentralized system.

IX. CONCLUSION

This project offers a decentralised platform for securely registering and discovering startup ideas using blockchain technology. It allows innovators to store their idea summaries on-chain, protecting ownership and preventing misuse, while detailed information is kept off-chain for easy access. With MetaMask wallet login, users can register ideas, explore others, or pay to unlock premium content, ensuring transparency, ownership, and fair monetization. The platform connects startup visibility with investor discovery through smart filters and access controls, serving as a valuable tool for the startup ecosystem.

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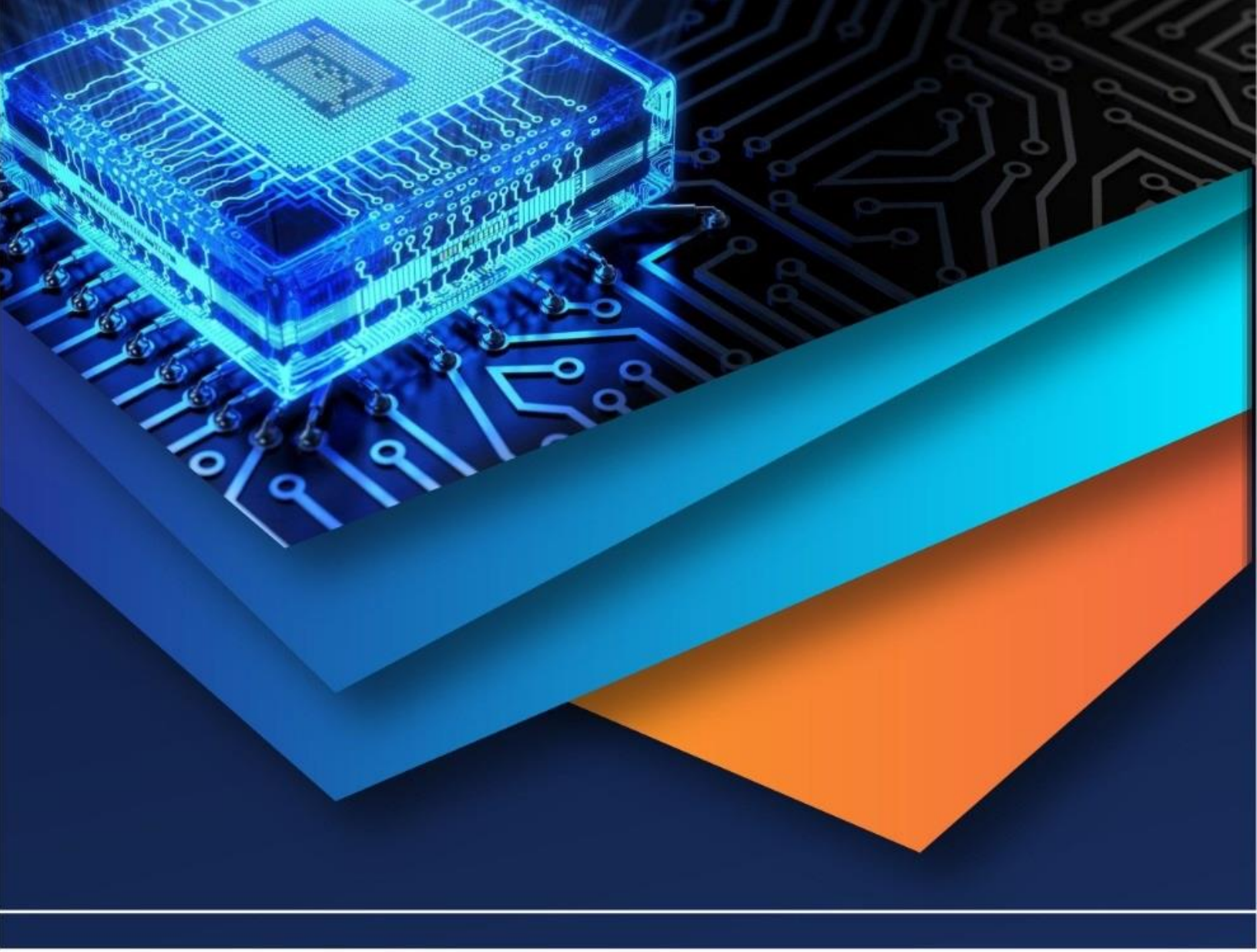
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