VIVEKANAND EDUCATION SOCIETY'S INSTITUTE OF TECHNOLOGY
An Autonomous Institute Affiliated to University of Mumbai
Department of Computer Engineering

Project Report on

Innovest: A ML-enabled and Blockchain-based DAO providing Venture Capital services

In partial fulfilment of the Fourth Year, Bachelor of Engineering (B.E.) Degree in Computer

Engineering at the University of Mumbai

Academic Year 2023-24

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(2023-24)

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Certificate

This is to certify that **Om Borate (D17C, 12), Divesh Mangtani (D17C, 34), Sujal Patil (D17C, 44), Tarun Shetty (D17C, 53*)*** of Fourth Year Computer Engineering studying under the University of Mumbai have satisfactorily completed the project on "**Innovest: A ML-enabled and Blockchain-based DAO providing Venture Capital services**" as a part of their coursework of PROJECT-II for Semester-VIII under the guidance of their mentor **Dr. (Mrs.) Nupur Giri** in the year 2023-24.

This project report entitled **Innovest: A ML-enabled and Blockchain-based DAO providing Venture Capital services** by ***Om Borate, Divesh Mangtani, Sujal Patil, Tarun Shetty*** is approved for the degree of **B.E. Computer Engineering.**

Programme Outcomes	Grade
PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12 PSO1, PSO2	

Date:
Project Guide:

Project Report Approval
For
B. E (Computer Engineering)

This project report entitled **Innovest: A ML-enabled and Blockchain-based DAO providing Venture Capital services** by ***Om Borate, Divesh Mangtani, Sujal Patil, Tarun Shetty*** is approved for the degree of **B.E. Computer Engineering.**

Internal Examiner

External Examiner

Head of the Department

Principal

Date:
Place: Mumbai

Declaration

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Date:

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Computer Engineering Department
COURSE OUTCOMES FOR B.E PROJECT

Learners will be to,

Course Outcome	Description of the Course Outcome
CO 1	Able to apply the relevant engineering concepts, knowledge and skills towards the project.
CO2	Able to identify, formulate and interpret the various relevant research papers and to determine the problem.
CO 3	Able to apply the engineering concepts towards designing solutions for the problem.
CO 4	Able to interpret the data and datasets to be utilised.
CO 5	Able to create, select and apply appropriate technologies, techniques, resources and tools for the project.
CO 6	Able to apply ethical, professional policies and principles towards societal, environmental, safety and cultural benefit.
CO 7	Able to function effectively as an individual, and as a member of a team, allocating roles with clear lines of responsibility and accountability.
CO 8	Able to write effective reports, design documents and make effective presentations.
CO 9	Able to apply engineering and management principles to the project as a team member.
CO 10	Able to apply the project domain knowledge to sharpen one's competency.
CO 11	Able to develop a professional, presentational, balanced and structured approach towards project development.
CO 12	Able to adopt skills, languages, environment and platforms for creating innovative solutions for the project.

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Abstract

In this decentralized setup, a diverse community of investors from around the world collaboratively contributes resources and expertise, collectively steering the investment process. Smart contracts facilitate consensus-based decision-making, promoting fairness and efficiency. The elimination of intermediaries fosters a trust less environment, inspiring confidence and attracting a broader spectrum of investors.

The decentralized DAO model offers entrepreneurs unprecedented access to a global network of backers with varied expertise and industry connections. Funding decisions are based on the merit and potential of projects, democratizing the investment landscape and promoting innovation from any corner of the world. Security and transparency are paramount in DAOs. Blockchain technology ensures immutable and auditable records of all transactions, minimizing fraud and enhancing trust among participants. Challenges such as regulatory compliance and smart contract vulnerabilities demand careful consideration, but the benefits of transparency and efficiency outweigh these obstacles.

The decentralized DAO for venture capital presents a unique opportunity for established firms to evolve and embrace a more inclusive and collaborative approach. As the industry pioneers this paradigm shift, there is an opportunity to shape a resilient and adaptive ecosystem that nurtures groundbreaking ideas and drives positive change.

In conclusion, the abstract sheds light on the transformative potential of decentralized DAOs for venture capital firms. As the world embraces this novel approach, the future of investment practices will be defined by transparency, decentralization, and a global community united in their pursuit of innovation and entrepreneurial success.

Chapter 1: Introduction

1.1. Introduction:

The problem traditional venture capital firms face is their limited geographical reach, centralised decision-making, and barriers to entry for investors., need Traditionally, venture capital firms have played a crucial role in fuelling the growth of innovative startups by providing funding, mentorship, and valuable industry connections. However, the traditional model often faces challenges such as geographical limitations, centralized decision-making, and barriers to entry for aspiring investors.

The emergence of blockchain technology and the concept of DAOs presents an exciting opportunity to address these challenges and unlock the untapped potential of the global investment community. A DAO is an organization governed by smart contracts on a blockchain, allowing for decentralized decision-making, transparency, and community-driven governance. In the context of venture capital, a decentralized DAO for a venture capital firm empowers a diverse and distributed group of investors from around the world to participate in funding promising startups. These investors pool their resources and expertise to collectively make investment decisions through a transparent and consensus-based process.

By eliminating intermediaries and introducing a trust less environment, DAOs remove geographical barriers and create a level playing field for investors and entrepreneurs. This open and inclusive approach democratizes the investment landscape, enabling innovative projects from any corner of the world to receive funding based on their merit and potential

1.2. Motivation:

The motivation for this project stems from the desire to address the challenges faced by traditional venture capital firms. These challenges include geographical limitations, centralized decision-making, and barriers to entry for aspiring investors. To overcome these issues, the emergence of blockchain technology and the concept of Decentralized Autonomous Organizations (DAOs) presents an exciting opportunity. DAOs are organizations governed by smart contracts on a blockchain, allowing for decentralized decision-making, transparency, and community-driven governance. In the context of venture capital, a decentralized DAO empowers a diverse and distributed group of investors from around the world to collectively make investment decisions through a transparent and consensus-based process. By eliminating intermediaries and introducing a trust less environment, DAOs remove geographical barriers, creating a level playing field for investors and entrepreneurs. This open and inclusive approach democratizes the investment landscape, enabling innovative projects from any corner of the world to receive funding based on their merit.

1.3. Problem Definition:

The limitations and disadvantages of Web2-based Venture Capital models compared to decentralized Web3 Venture Capital DAOs. Web2 Venture Capital faces challenges including centralized control, limited accessibility, opaque decision-making, long fundraising processes, limited liquidity, inefficient operations, potential conflicts of interest, limited collaboration, and high fees. These drawbacks hinder the transparency, inclusivity, efficiency, and overall effectiveness of traditional VC models. The problem at hand is to address these limitations and transition towards Web3 Venture Capital DAOs, which aim to provide a more decentralized, transparent, accessible, and efficient means of funding startups and projects while reducing the disadvantages associated with Web2-based Venture Capital.

1.4. Existing Systems:

1. OrangeDAO

OrangeDAO is a venture fund of past, present, and future Y Combinator founders who specialize in crypto. In addition to offering pre- and post- Y Combinator funding, Orange DAO also helps startups apply to, and be accepted into Y Combinator, while helping mentor their leadership and recruit talent, and acquire customers.

2. SeedClub

The mission of Seed Club is to assist web3 community builders. They are creating a future in which the value created by online communities is captured by people rather than platforms. Seed Club accomplishes this through its accelerator, studio projects, and expanding network of contributors, collaborators, and members. Seed Club's value is derived from its network of projects and DAO ecosystem of builders.

3. What is Global Coin Research (GCR)

GCR is a research and investment DAO. Holders of $GCR and writers on the platform get access to the best resources the community has to offer, including but not limited to deep insights and research generated by the community, founder-focused events online and offline, learning and user feedback sessions, and direct deal-flow. Collectively, members of GCR source, diligence and commit personal capital into opportunities ranging from seed to late-stage growth.

4. DAO.VC

DAO.vc is a decentralized autonomous entity that acts as a service for a pool governed by shared voting on investment projects chosen using a predefined algorithm. The platform is built around an autonomous voting mode for participants to share various assets based on smart contracts and other governance features. One of the primary features that promise to attract new users to the platform is the ability to enter the ecosystem with very little capital, making the platform accessible to any investor.

1.5. Lacuna of the Existing System:

1. **Limited Inclusivity:** Many of these systems, while designed to democratize venture capital, may still have barriers to entry. They often require participants to hold specific tokens or meet certain criteria, potentially excluding smaller or less experienced investors.

2. **Token Volatility:** The value of tokens associated with these systems can be highly volatile. This volatility can affect the perceived value of investments and complicate decision-making.

3. **Transparency and Governance:** While DAOs are designed for transparency and decentralized governance, challenges related to decision-making processes, transparency, and fairness can still arise. Ensuring that the governance structures are truly democratic and transparent can be difficult.

4. **Integration with Traditional Finance:** Integrating decentralized venture capital systems with traditional financial systems can be complex and may require navigating the divide between the digital and real worlds. This can create operational challenges.

1.6. Relevance of the Project:

The context of modern finance and investment for several reasons:

Addressing Key Challenges: The project's primary motivation is to address the key challenges faced by traditional venture capital firms. These challenges include geographical limitations, centralized decision-making, and barriers to entry for aspiring investors. By tackling these issues, the project aims to make the investment landscape more inclusive, transparent, and accessible.

Leveraging Blockchain Technology: The emergence of blockchain technology and Decentralized Autonomous Organizations (DAOs) is a significant innovation in the financial and investment sectors. The project's relevance lies in harnessing this technology to improve the way investment decisions are made and how funds are allocated.

Democratizing Investment: By eliminating intermediaries and introducing a trust less environment, the project aims to democratize the investment landscape. This is particularly relevant as it empowers a diverse group of investors from around the world to collectively make transparent and consensus-based investment decisions.

Enhancing Transparency: The project addresses the issue of opaque decision-making in traditional venture capital. The relevance of this aspect is seen in the project's efforts to provide more transparency in investment processes, enabling entrepreneurs and investors to gain better insights into the evaluation process.

Efficiency and Lower Costs: The transition towards Web3 Venture Capital DAOs can significantly reduce inefficiencies and lower overhead costs associated with traditional venture capital. This is relevant in making investment more cost-effective and efficient.

Reducing Barriers to Entry: By removing barriers such as high minimum investment requirements, the project's relevance is evident in its aim to make early-stage startup funding more accessible to a broader range of investors.

Chapter 2: Literature Survey

A. Overview of literature survey:

This Web3 Venture Capital DAO project relies on a robust literature survey as its cornerstone. The survey will dissect the documented limitations of traditional VC models, including issues like centralized control, limited investor access, and opaque decision-making. By examining existing research, it will explore how DAOs, with their emphasis on transparency and community-driven governance, offer potential solutions. Next, the survey will delve into Web3 and blockchain technology, dissecting their core functionalities like security and smart contracts, and analyzing their potential impact on the financial landscape. Finally, the focus will shift to the exciting, yet nascent, field of Web3 VC DAOs. Here, recent research on proposed DAO structures, potential challenges like regulations and smart contract vulnerabilities, and any existing examples of these DAOs in action will be examined. This comprehensive analysis will provide the necessary insights to ground the project in existing research, identify opportunities and challenges presented by Web3 technology, and ultimately propose a compelling methodology for the Web3 VC DAO.

2.1. Research Papers:

1. **Blockchain Technology and Smart Contracts: "Mastering Bitcoin: Unlocking Digital Cryptocurrencies" by Andreas M. Antonopoulos: This book provides a comprehensive introduction to blockchain technology**
    a) **Abstract:** "Mastering Bitcoin: Unlocking Digital Cryptocurrencies" by Andreas M. Antonopoulos, as inferred from the title and author's expertise, likely serves as a comprehensive guide to blockchain technology, the backbone of cryptocurrencies like Bitcoin. The book delves into the core concepts that make blockchain function, including its decentralized nature. Unlike traditional systems with central authorities, blockchain distributes a shared ledger across a network of computers, eliminating the need for a single entity to control transactions. Furthermore, the book likely explores the cryptographic security measures employed by blockchain, such as digital signatures and hashing functions. These techniques ensure the authenticity and immutability of data, preventing unauthorized modifications or tampering with transactions. Additionally, the abstract suggests the book sheds light on consensus mechanisms, the methods by which all participants in the network agree on the validity of transactions. Examples like Proof-of-Work and Proof-of-Stake are potential mechanisms explored, each ensuring a secure and reliable network. Finally, the book likely explains the concept of immutability, where transactions are permanently recorded and irreversible. This creates a tamper-proof audit trail for all activity on the network. In essence, "Mastering Bitcoin" equips readers with the fundamental knowledge of blockchain technology, a crucial element for building Web3 Venture Capital DAOs. By understanding these core functionalities, the project can leverage the security, transparency,

and decentralized nature of blockchain to create a robust and trustworthy platform for investment activities within the DAO.

b) **Inference:** "Mastering Bitcoin" dives deep into blockchain, the bedrock of our Web3 VC DAO. By understanding its cryptography (security!), we can safeguard investments. The book's explanation of immutability empowers transparency: all transactions are permanently recorded. Finally, the decentralized nature of blockchain (likely explored in the book) fosters trust by eliminating central authorities. In short, this book equips us to build a secure, transparent, and trustworthy Web3 VC DAO.

2. Decentralized Autonomous Organization (DAO) of DAOs

a) Abstract: A well-governed DAO of DAOs can provide technological and community solutions for the evolution of the DAO ecosystem. Through its technological infrastructure designs, a DAO of DAOs can create, improve and expand well-functioning and well-governed networks of DAOs. That DAO infrastructure, in turn, improves most of the applications and uses of digital assets and decentralized commerce for the greater good of society. This article examines the core features of a possible DAO of DAOs design, its ability to expand the DAO ecosystem, and the design's uses in business and society.

b) **Inference:** The paper likely explores the concept of a DAO (Decentralized Autonomous Organization) composed entirely of other DAOs. This structure, essentially a "DAO of DAOs," would create a new layer of complexity within the already intricate world of DAO governance. The author, affiliated with a law school, suggests the paper might delve into the legal implications and challenges of such a structure. It could analyse how decisions are made, how funds are managed, and potential legal issues surrounding this novel organizational form.

3. DeFi Lending Concepts Part 2: Liquidations

a) **Abstract:** This paper, the second in a three-part series on DeFi lending protocols, explores the concept of liquidations. Liquidations are a critical mechanism that helps ensure the stability of DeFi lending. The paper begins with a review of over-collateralization and how it prevents bad debt in DeFi loans. It then dives into the specifics of liquidations, including liquidation thresholds and how different protocols handle them. The paper analyzes how Compound, Maker, and AAVE V2 implement liquidations using concepts like "Account Liquidity" and "Health Factor." Finally, it discusses the broader implications of liquidations for DeFi lending as a whole.

b) **Inference:** This part of the resource dives into the concept of liquidations within the context of DeFi (Decentralized Finance) lending. Liquidations are a crucial mechanism to ensure the stability of lending protocols. The resource likely explains how DeFi lending works, where borrowers deposit collateral to secure loans, and what happens when the value of that collateral falls below a certain threshold. This situation is called under-collateralization. The inference is that the resource will explore how

the lending protocol handles under-collateralized loans. It will likely explain the process of liquidation, where a third-party (called a liquidator) can repay the borrower's debt at a discount in exchange for seizing the borrower's collateral. This incentivizes borrowers to maintain a healthy loan-to-value ratio and protects the lending protocol from bad debt.

4. Arroyo, Javier & Corea, Francesco & Jimenez-Diaz, Guillermo & Recio-García, Juan. (2019). Assessment of Machine Learning Performance for Decision Support in Venture Capital Investments.

a) **Abstract:** The venture capital (VC) industry offers opportunities for investment in early-stage companies where uncertainty is very high. Unfortunately, the tools investors currently have available are not robust enough to reduce risk and help them managing uncertainty better. Machine learning data-driven approaches can bridge this gap, as they already do in the hedge fund industry. These approaches are now possible because data from thousands of companies over the world is available through platforms such as Crunchbase. Previous academic efforts have focused only on predicting two classes of exits, i.e., being acquired by other company or offering shares to the public, using only one or a few subsets of explanatory variables. These events are typically related to high returns, but also higher risk, making hard for a venture fund to get repeatable and sustainable returns. On the contrary, we will try to predict more possible outcomes including a subsequent funding round or the closure of the company using a large set of signals. In this way, our approach would provide VC investors with more information to set up a portfolio with lower risk that may eventually achieve higher returns than those based on finding unicorns (i.e., companies with a valuation higher than one billion dollars). We will analyze the performance of several machine learning methods in a dataset of over 120,000 early-stage companies in a realistic setting that tries to predict their progress in a 3-year time window. Results show that machine learning can support venture investors in their decision-making processes to find opportunities and better assessing the risk of potential investments.

b) Inference: The study suggests that machine learning can be a valuable tool for venture capitalists in the initial screening of potential investments, especially for companies with no prior data. A multi-class approach that considers multiple outcomes (e.g., moderate success, acquisition) is more informative than a simple good/bad binary system. This allows investors to develop a more nuanced portfolio strategy and potentially achieve higher returns by focusing on a broader range of investments. Further research could improve the accuracy of the machine learning model by incorporating additional data points about the founders and the business sector.

5. **Augustin, N., Eckhardt, A. & de Jong, A.W. Understanding decentralized autonomous organizations from the inside. Electron Markets 33, 38 (2023).**
    a) **Abstract:** Blockchain technology is argued to drastically change the way we operate within an organizational context, with decentralized autonomous organizations (DAOs) representing a first manifestation of this ongoing trend. DAOs are characterized by an online community that builds the organization's backbone by providing knowledge and human resources in a transparent, virtual manner, as well as the use of blockchain technology to coordinate their endeavour. Nevertheless, current research highlights the conceptual ambiguity of this emerging phenomenon, leading to potential issues for practitioners and researchers. To provide further clarity on the phenomenon, we study DAOs through the perspective of their members with a two-staged approach by combining elements of a ethnographic approach and structural topic modelling. Our findings highlight several contextual features surrounding DAOs, such as their members' underlying beliefs and views, helping to embed DAOs in existing research streams.
    b) **Inference:** In this paper, analysis of online discussions offers valuable insights into Decentralized Autonomous Organizations (DAOs) from a user-centric perspective. By examining how DAO members define and discuss these organizations, the study reveals the core elements of DAOs as understood by their communities. Furthermore, the analysis explores governance structures and the beliefs held by DAO members, providing context for how these organizations function. The research also identifies key use cases for DAOs, such as decentralized finance (DeFi) and collective ownership, highlighting their potential applications. However, the analysis doesn't shy away from challenges. It acknowledges open issues like potential recentralization, unclear regulations, scams, and transaction fees, underscoring areas that require attention for DAOs to thrive. For transparency, the study incorporates quotes from the data, allowing readers to see the reasoning behind the conclusions.

6. **Kaushal Shah, Dhruvil Lathiya, Naimish Lukhi, Keyur Parmar, Harshal Sanghvi, A systematic review of decentralized finance protocols, International Journal of Intelligent Networks, Volume4, 2023, Pages 171-181, ISSN2666-6030.**
    a) **Abstract:** Decentralized finance (DeFi) is rapidly transforming financial services by offering an alternative to traditional systems. This growth is driven by factors like eliminating expensive middlemen, reducing fees, and increasing accessibility. As DeFi expands, understanding different DeFi protocols (like lending, exchanges, and asset management) becomes crucial for creating innovative financial products and exploring the full potential of this revolutionary technology.

b) **Inference:** This research on DeFi protocols underlines the critical role of composability, which allows different DeFi protocols to be combined like building blocks. This interchangeable nature is essential for DeFi's functionality. The study reveals that despite offering various services, DeFi protocols share standardized techniques, creating a foundation for this modular approach. This composability fosters an interconnected ecosystem where developers can rapidly design and build innovative financial products. The research highlights that this modularity and open-source nature of DeFi fuel rapid innovation and lead to a more inclusive financial system. However, the study acknowledges the need to address data security and privacy concerns within DeFi. Overall, the research demonstrates that DeFi protocols not only increase the usefulness and accessibility of money globally but also empower individuals by democratizing the financial landscape. By understanding composability, developers can create new DeFi applications and infrastructure, paving the way for a more decentralized and accessible financial future for all.

7. **Naudts, Ellen, The Future of DAOs in Finance - in Need of Legal Status (October, 2023). ECB Occasional Paper No. 2023/331, Available at SSRN: https://ssrn.com/abstract=4605627**
   a) **Abstract:** Despite the crypto-market crash in the spring of 2022 and the collapse of FTX in November 2022, decentralised finance (DeFi) proponents are still predicting that DeFi may soon go mainstream. As well as the increasing involvement of regulated financial institutions in the DeFi area, the incipient presence of regulatory, supervisory and oversight frameworks may lead to more mainstream acceptance of DeFi. Many DeFi projects are structured in the form of a decentralised autonomous organisation (DAO), a virtual organisation built and run on code and blockchain technology. As this new DAO corporate structure has benefits appropriate for the era of digitalisation and decentralisation, the number of DAOs is growing. However, most countries around the globe do not yet have in place a specific legal regime for DAOs. Until now, DAOs have been operating outside of regulatory financial frameworks, even though they may perform functions that are similar to regulated financial institutions or market infrastructures. This paper introduces the DAO structure and how it relates to other methods of organisation in finance. The paper lists use cases and describes the benefits and drawbacks of the DAO structure, taking a closer look at (inter)national regulatory frameworks, guidelines and recommendations in order to discuss whether, how and to what extent DAOs might comply. A policy position on the desirability and conditions under which DAOs could bring efficient, safe and stable innovations to the financial sector depends on the specificities of the individual DAOs, the potential applicable regulatory frameworks and the continuously evolving technical developments, as well as (inter)national guidelines and recommendations. This paper proposes that the establishment of regulatory frameworks on crypto-assets and crypto-asset services, such as the EU Markets in Crypto-Assets (MiCA) Regulation, may force DAOs to rethink their legal status, governance and operational models.

b) **Inference:** DAO technology is outpacing regulations, creating hurdles for their growth in finance. New, collaborative regulations are crucial. Legal structures can benefit DAOs by limiting liability and enabling interaction with traditional finance, while still preserving core DAO principles. Key questions remain on DAO function, asset ownership, and real-time supervision. Regulatory bodies are actively researching these issues, and successful resolution is essential for widespread DAO adoption in finance.

8. **Metelski, D.; Sobieraj, J. Decentralized Finance (DeFi) Projects: A Study of Key Performance Indicators in Terms of DeFi Protocols' Valuations. Int. J. Financial Stud. 2022, 10, 108.**
    a) **Abstract:** Decentralized Finance (DeFi) protocols are emerging as an alternative to traditional financial services, offering solutions like banking, investment, and trading through blockchain technology. These protocols incentivize the development of a new financial market and potentially mitigate portfolio risk, especially in volatile times. Notably, some DeFi protocols employ low-risk "delta-neutral" strategies to generate returns. However, unlike traditional finance with established valuation methods, DeFi protocols lack a similar framework. This research aims to bridge this gap by evaluating how performance metrics like total value locked (TVL) influence the valuation of DeFi protocols. The study analyses 30 protocols across different categories (decentralized exchanges, lending, asset management) to assess these relationships. Interestingly, the study suggests that TVL may not be a reliable predictor of future valuations, but a two-way causal relationship exists between valuation and gross merchandise volume. This highlights the need for further exploration of DeFi valuation metrics to establish a more comprehensive understanding of this evolving financial landscape.
    b) **Inference:** The study also emphasizes the diversity of the DeFi market, with categories like lending and asset management showing different sensitivities to TVL fluctuations. These findings contribute to a more systematic understanding of DeFi valuation, aiding both investors and researchers. The research positions DeFi as a viable alternative to traditional finance, with its own valuation dynamics. The empirical evidence can inform investment decisions and protocol design for DeFi practitioners. However, the limitations of using TVL as the sole metric are identified, suggesting a need for further exploration of DeFi-specific valuation frameworks. The study also sheds light on causal relationships between metrics. While TVL doesn't predict future valuations, a two-way causal link exists between valuation and GMV. By analyzing these complex relationships, we can gain a deeper understanding of how DeFi protocols function.

2.2. Patent Search:

1. **BLOCKCHAIN INSTRUMENT FOR TRANSFERABLE EQUITY**
   (US11875406B1) Inventor: Thomas Marshall Gordon, III, Gregory Frederick Bush
   The Systems and methods for offering and purchasing tokenized securities on a blockchain platform meeting current and future federal, state, and offering and holding entity rules and regulations. Tokenized securities purchased during or after the tokenized securities offering are tradable on a secondary market. The server computer of the tokenized securities provides an automated transfer capability for tokenized securities holders.

2. **DISTRIBUTED LEDGER INVESTMENT GOVERNANCE PLATFORM**
   (US20200311816A1) Inventors: Ross Way Calvin
   A cryptographic system and mechanism for combining the authenticating of industrial activity and processes and placing investments. Embodiments of the present invention can provide a system that allows for transmitting and filtering oil and gas transactions through a comprehensive, interlocking distributed ledger-based supply chain ecosystem and cryptocurrency-enabled capital funding mechanism, so that such transactions can be monetized to reduce costs, execution times, and risk, while elevating information quality.

3. **SYSTEM AND METHOD OF PROVIDING AND RECORDING PERSONALIZED CONTEXT-SPECIFIC ADVICE IN THE FORM OF AN ARTIFICIAL INTELLIGENCE VIEW OF A HIERARCHICAL PORTFOLIO** (**US20220383417A1) Inventors:** Mark Cummings
   In an intelligent system for providing and recording personalized context-specific financial advice, a method may comprise receiving, from a client device, a request for advice regarding a hierarchical portfolio of assets owned by an investor. The method may further comprise generating, based on the output of a neural network machine learning model, artificial intelligence suggestions for changing the hierarchical portfolio, assembling the AI suggestions and suggestion locations into an actionable artificial intelligence view of the hierarchical portfolio, and transmitting the AI view to the client device. The method may further comprise making a cryptocurrency payment related to service fees associated with the AI view via a blockchain network. The method may further comprise submitting placed transactions associated with the AI suggestions to an electronic trading platform, generating a revised hierarchical portfolio, and recording the AI view on a blockchain, thereby establishing or maintaining a portable financial record for the investor.

2.3. Inference Drawn:

- In all the patents that we have seen, there are very few systems that offered both parameters as well as investments.
- We took some inspiration from the project made Binance Launchpad during the making of our project.

2.4. Comparison with the Existing Systems:

Other System	Our System
Focus only on decentralized venture and crypto space	Focuses on web3 venture capital DAOs and aim for more inclusive model.
May have barriers to entry like token owner - Ship requirement	Aims to eliminate these barriers.
It generally deals with the volatility of tokens	It will manage this volatility
Challenges integrating with traditional finance	It aims to facilitate this integration

table 2.1 Comparison with existing system

Chapter 3: Requirement Gathering for the Proposed System

In this chapter we are going to discuss the resources we have used and how we analysed what the user actually needs and what we can provide. We will also discuss the functional and non-functional requirements and finally the software and hardware used.

3.1. Introduction to Requirement Gathering:

The Requirement Gathering is a process of requirements discovery or generating list of requirements or collecting as many requirements as possible by end users. It is also called as requirements elicitation or requirement capture.

3.2. Functional Requirements:

- **Smart Contracts Development**: The system must support the development of smart contracts using Solidity, Rust, and JavaScript for execution.
- **Chainlink Integration**: The system should integrate with Chain-link for accessing external data through oracles to enhance the functionality of smart contracts.
- **Wallet Integration**: It should provide integration with MetaMask to enable users to interact with Ethereum-based applications securely
- In **API and SDK Integration:** The system should support Moralis and Third Web for simplified access to blockchain data and web3 integration.

3.3. Non-Functional Requirements:

- **Security**: The system should prioritize security to protect smart contracts and sensitive data.
- **Usability**: The system's user interface should be user-friendly, allowing developers to easily build and deploy smart contracts.
- **Documentation**: Comprehensive and up-to-date documentation should be provided for developers to understand and use the system effectively

3.4. Hardware, Software, Technology and Tools Utilised:

A. Hardware Requirements: -

a. Minimum 4 GB RAM

b. Core I5 8th Gen processor

c. NVIDIA GPU

d. Disk space of 20GB HDD

B. Software Requirements: -

a. Ubuntu / Mac Os

Techniques: -

- **Hardhat: -** Think of Hardhat as a developer's toolbox for Ethereum projects. It streamlines tasks like local blockchain deployment, smart contract writing, and testing, making the development process faster and more efficient.

- **React + Next.js:** This duo is a powerful combination for building user-friendly interfaces for web3 applications. React provides the building blocks for interactive elements, while Next.js adds features like server-side rendering and static site generation, leading to a smooth and performant user experience.

- **MetaMask (Wallet):** Consider MetaMask your gateway to the world of web3. It functions as a digital wallet where you can store your cryptocurrencies and interact with decentralized applications. MetaMask allows you to sign transactions and approve actions within dApps, giving you control over your digital assets.

Tools: -

- **Vscode: -**Visual Studio Code is a streamlined code editor with support for development operations like debugging, task running, and version control. It aims to provide just the tools a developer needs for a quick code-build-debug cycle and leaves more complex workflows to fuller featured IDEs, such as Visual Studio IDE.
- **Language**: JavaScript, Solidity, Rust.
- **Blockchain**: Ethereum.
- **API and SDK:** Moralis and third web

3.5. Constraints:

- The constraint of working for a Venture Capital DAO is navigating the evolving regulatory landscape while ensuring full compliance.
- The project must allocate resources to legal consultations and adapt to changes in regulations as they emerge.
- This constraint can affect the speed and flexibility of the platform's operations, as it must operate within the confines of the law.
- It may require ongoing legal support and monitoring, which can increase operational costs and potentially slow down certain activities

Chapter 4: Proposed Design

4.1. Block Diagram of the proposed system:

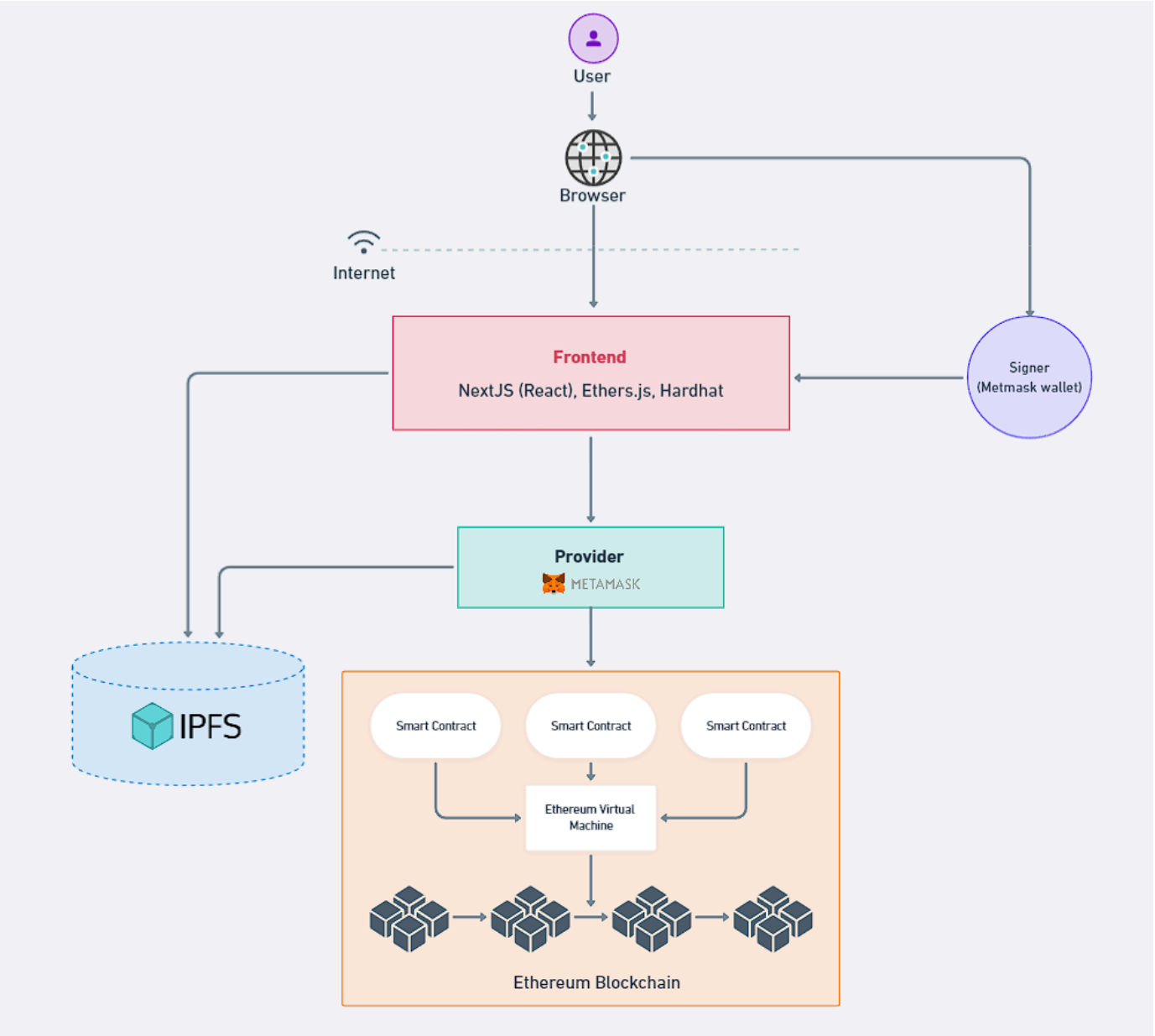


Fig 4.1: Block Diagram of Innovest

4.2. Modular diagram of the system:

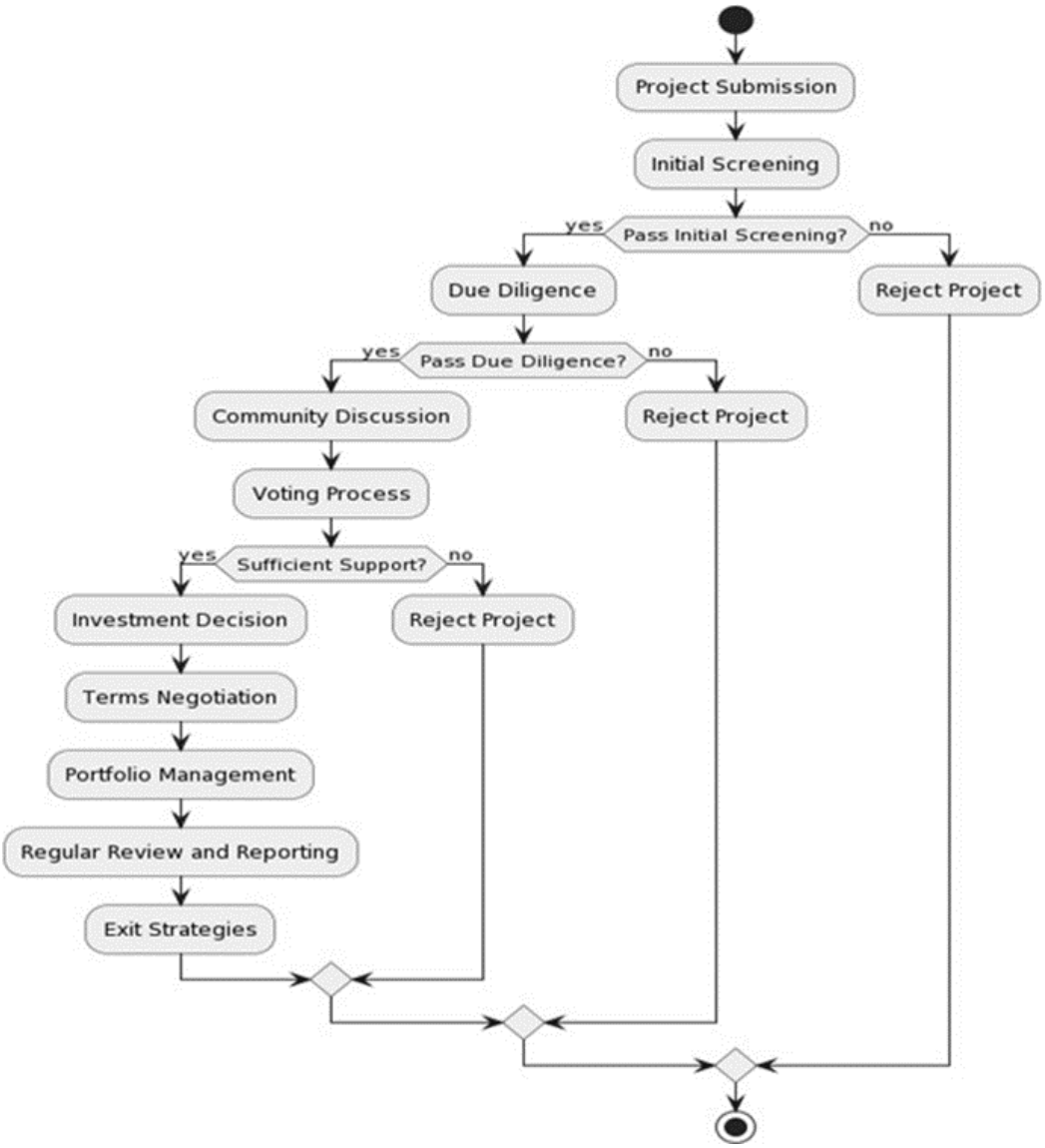


Fig 4.2: Modular Diagram

The application's flow, as depicted in Figure 4.2, is comprehensively elaborated below

- **Project Submission:** Entrepreneurs or project leaders can submit investment proposals through the DAO's platform. Here they share the details of their project
- **Initial Screening**: An initial screening is conducted to filter out proposals that don't meet the DAO's basic criteria. This could involve factors like the type of project, its fit with the DAO's investment thesis, or the completeness of the proposal.
- **Due Diligence**: Proposals that pass the initial screening undergo a more thorough due diligence process. This involves screening by a trained machine learning model which is discussed later in the paper.
- **Community Discussion**: Shortlisted proposals are then opened up for discussion and feedback from the DAO community. This is a comprehension of the voting process where decisions need to be made, given that the participators have staked enough tokens to get rights to decision-making.

- **Voting Process**: Investors then vote on whether to invest in a particular project or not. The voting process is likely to be built into the DAO's smart contract, ensuring transparency and immutability.
- **Investment Decision:** If a proposal receives a sufficient number of votes in favor, the DAO moves forward with the investment.
- **Terms Negotiation:** The DAO and the project team negotiate the terms of the investment, such as the amount of funding, the valuation of the project, and the rights and obligations of each party.

  Portfolio Management: Once an investment is made, the DAO becomes part of the project's investor group and may participate in portfolio management activities. This could involve monitoring the project's progress, providing guidance and support to the team through various communication interfaces, and participating in future funding rounds.

- **Regular Review and Reporting:** The DAO regularly reviews its portfolio companies and reports on its performance to its members. This transparency is a hallmark of DAOs.
- **Exit Strategies:** The DAO also needs to consider exit strategies for its investments. This could involve selling its shares in a project to another investor, participating in an initial coin offering (ICO), or repurchasing its shares from the project founders.

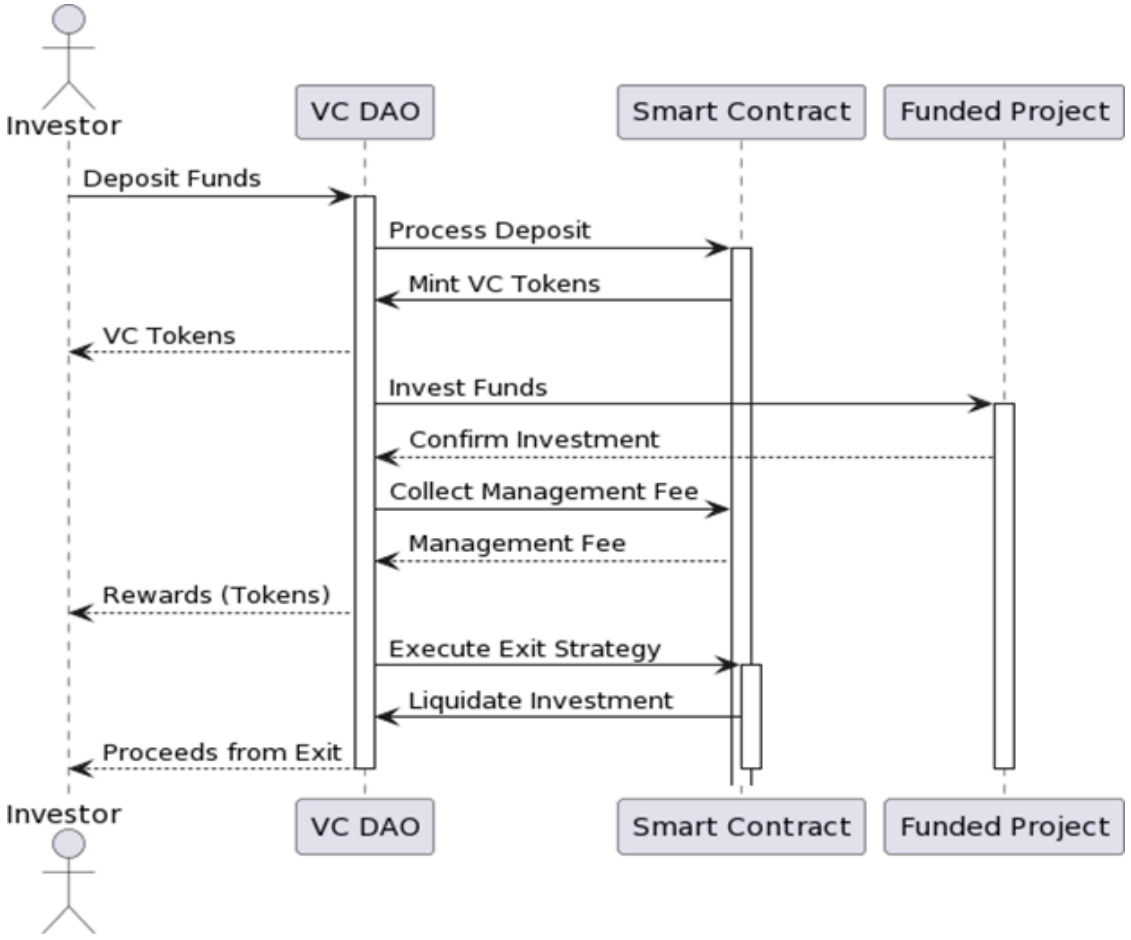


Fig 4.3: Investors Perspective

The investor's perspective in Fig 4.3 suggests the investor experience within our application revolves around contributing funds and receiving VC tokens that grant ownership and potential voting rights. Investors can then let the DAO members do the work of investments and track how their investments are going using the Dashboard. If an investment performs well, the investor may receive token-based rewards. Finally, when an investor decides to exit, they initiate a process to liquidate their holdings and retrieve their original funds through the DAO's platform.

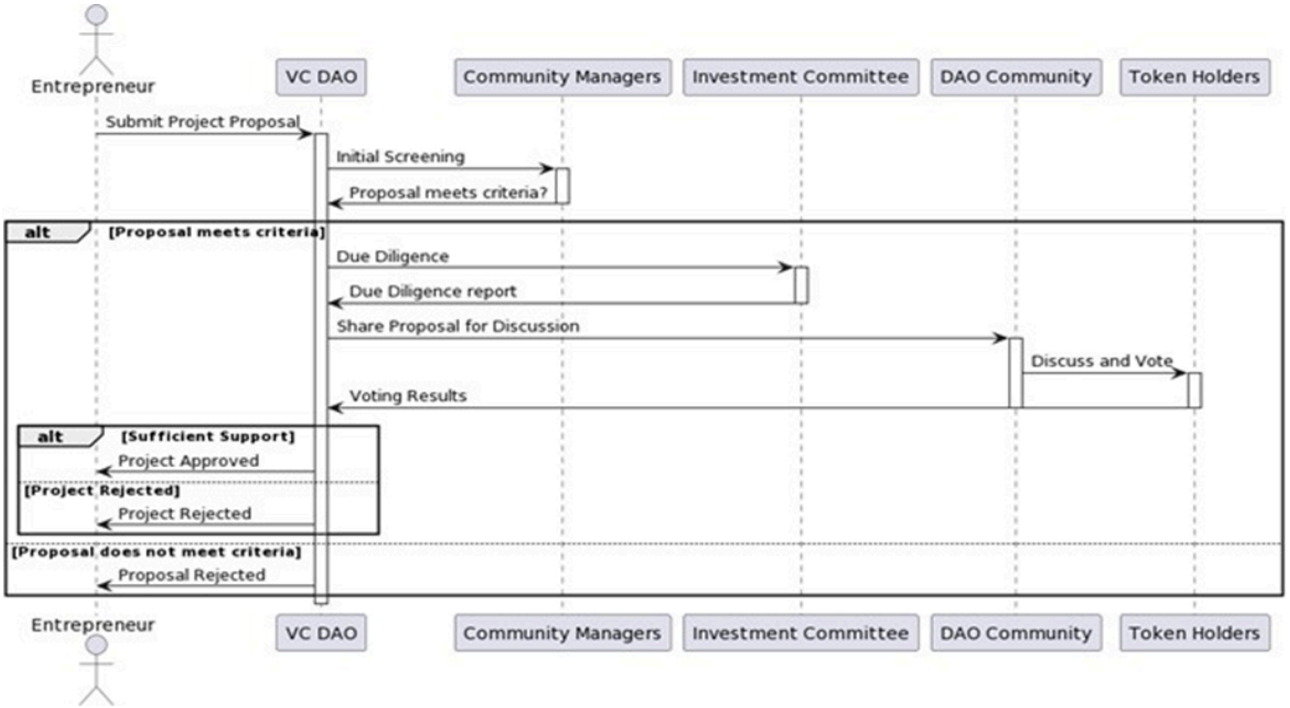


Fig 4.4: Entrepreneur’s Perspective

Fig 4.4 illustrates the entrepreneur’s perspective. The journey begins with crafting a compelling proposal that outlines the project, its goals, its details, and the specific investment amount requested.
This proposal goes through an initial screening by the DAO to ensure it aligns with their investment focus (industry, stage of development, etc.). If it passes this initial hurdle, the entrepreneur prepares for a more rigorous due diligence process. Here, the DAO dives deeper, scrutinizing the ML model to screen out the project ideas based on the project's business model and financial projections, and the overall market opportunity. Proposals that survive due diligence are then presented to the DAO community for a period of open discussion and feedback. The ultimate decision on funding hinges on a vote by DAO members. If the proposal garners enough support, the entrepreneur enters into negotiation with the DAO to finalize the investment terms, including the amount, valuation of the project, and the rights and obligations of both parties. Upon successful negotiation, the entrepreneur receives the funding and becomes part of the DAO's portfolio. However, the relationship doesn't end there. The entrepreneur is expected to keep the DAO community updated on the project's progress, fostering transparency and trust. The DAO itself might also play a role in portfolio management, offering guidance and support to entrepreneurs as they navigate the challenges and opportunities that lie ahead.

4.3. Detailed Design

DFD Level 0:

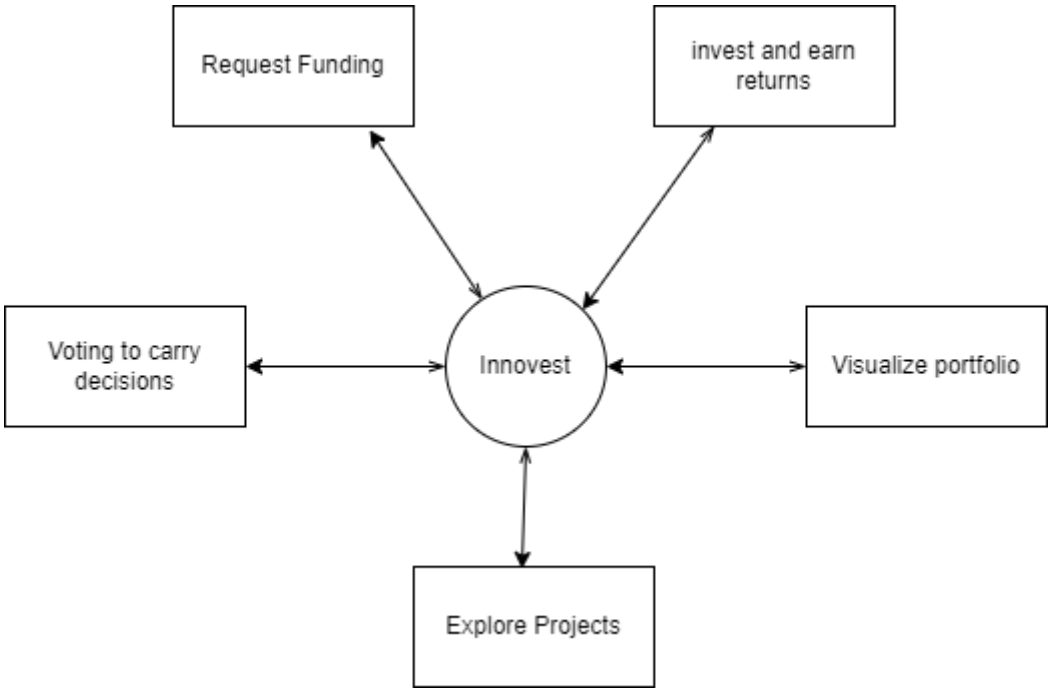


Fig 4.5: DFD

4.4. Project Scheduling & Tracking using Time line / Gantt Chart:

The Gantt chart of our project where we worked for the complete final year to create our project is shown in a timeline pattern. It is the most important part to think and design the planning of your topic and so we planned our work like the gantt chart shown.

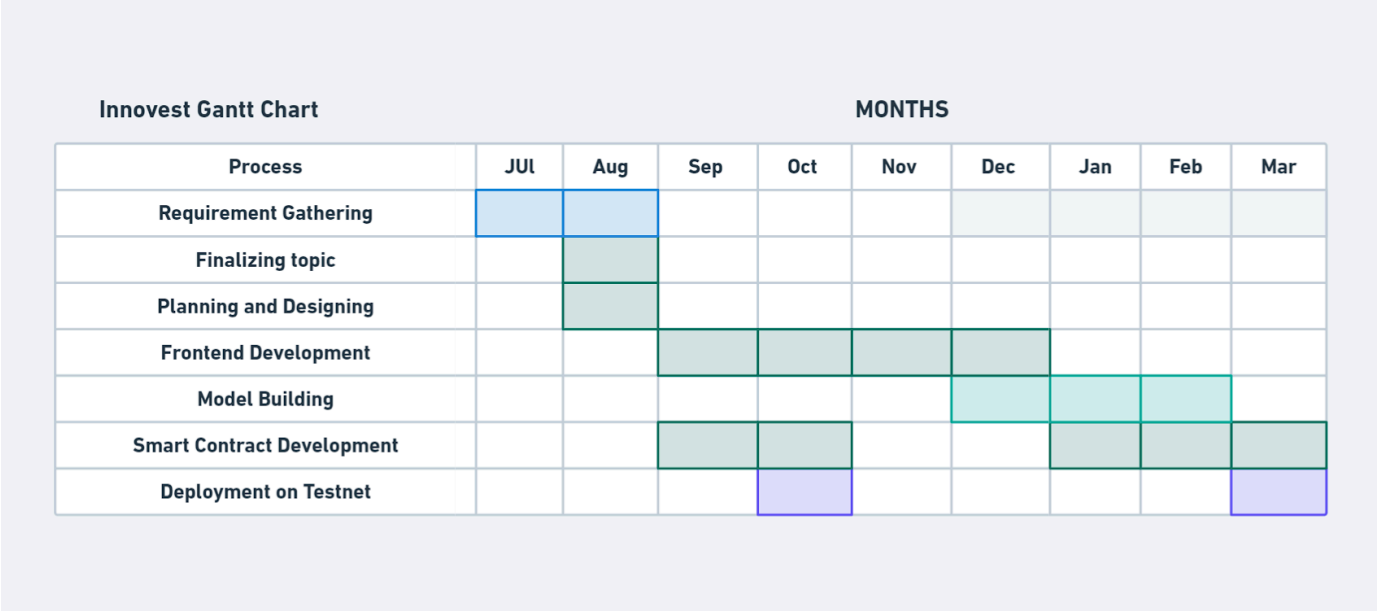


Fig 4.6 : Gantt chart

Chapter 5: Implementation of the Proposed System

5.1. Methodology employed for development:

Our proposed solution contains 3 major actors:

- **Investors:** Individuals investing their capital for a period of time for good returns from the investments.
- **Project owners:** They represent the startup owners who are required to raise capital for the further scaling/development of their project.
- **DAO maintainers:** They are the individuals elected to maintain the DAO and are responsible for the investment process.separately.

The project submission process within the Innovest DAO platform begins with entrepreneurs or project leaders submitting investment proposals, detailing their projects' specifics. Following this submission, an initial screening phase is conducted to filter out proposals that don't align with the DAO's basic criteria, which may include factors such as project type, compatibility with the DAO's investment thesis, or the completeness of the proposal. Proposals that pass this initial screening undergo a more thorough due diligence process. This involves screening by a trained machine learning model, as further discussed later in the paper.

Shortlisted proposals then enter a phase of community discussion and feedback within the DAO community. This stage resembles a comprehensive voting process, where decisions are made based on the participation of members who have staked enough tokens to gain decision-making rights. Subsequently, investors within the DAO vote on whether to invest in a particular project or not, with the voting process likely integrated into the DAO's smart contract to ensure transparency and immutability.
Upon receiving a sufficient number of votes in favor, the DAO proceeds with the investment. At this point, negotiations between the DAO and the project team commence to finalize investment terms, including the funding amount, project valuation, and respective rights and obligations. Once the investment is made, the DAO becomes part of the project's investor group and may engage in portfolio management activities. This includes monitoring the project's progress, providing guidance and support through various communication channels, and potentially participating in future funding rounds.

The DAO ensures transparency by regularly reviewing its portfolio companies and reporting on their performance to its members. Additionally, it considers various exit strategies for its investments, such as selling shares to another investor, participating in an initial coin offering (ICO), or repurchasing shares from the project founders. These exit strategies are essential for managing the DAO's investment portfolio effectively and maximizing returns for its members.

5.2.Algorithms and Flowcharts for the respective modules developed:

Gradient Boosting Algorithm:

The algorithm operates in an iterative fashion, gradually improving the model's performance by minimizing a specified loss function. It begins by initializing the model with a simple constant value or a base prediction, often the mean of the target variable for regression tasks or a class probability for classification tasks. Subsequent iterations focus on correcting the errors made by the previous iterations, effectively reducing the residual errors in the predictions.

During each iteration, Gradient Boosting fits a weak learner, such as a decision tree, to the residuals of the previous predictions. This weak learner is trained to capture the patterns in the residuals, aiming to improve upon the model's predictions. The predictions of the weak learner are then combined with the predictions of the existing model using a learning rate parameter, which controls the contribution of each weak learner to the overall ensemble.

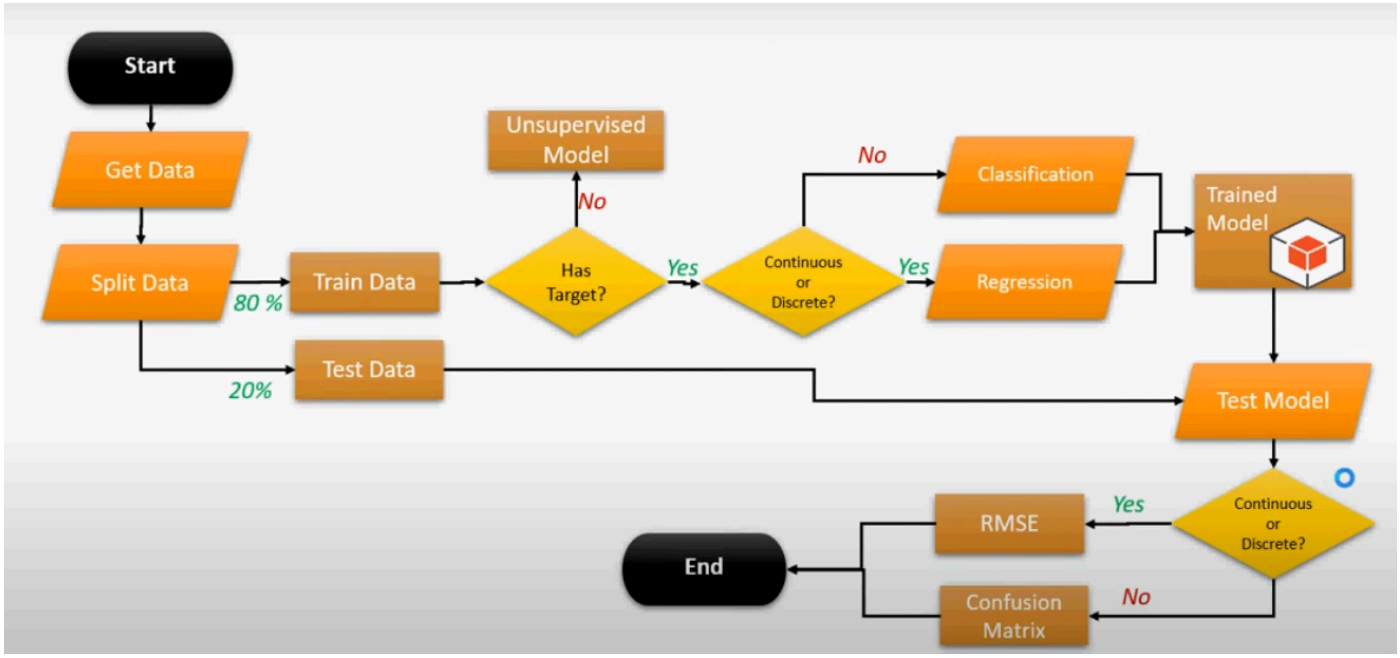


Fig 5.1: Flowchart of Gradient Boosting model

The process continues iteratively, with each new weak learner focusing on the remaining errors in the predictions. By sequentially adding weak learners and updating the model's predictions, Gradient Boosting gradually reduces the error and improves the overall performance of the model. The final prediction is obtained by aggregating the predictions of all weak learners, weighted by their respective contributions determined during training.

One of the key strengths of Gradient Boosting lies in its ability to handle complex, non-linear relationships in the data and effectively capture interactions between features. Additionally, it is relatively robust to overfitting, thanks to its iterative nature and the use of regularization techniques such as shrinkage and tree

pruning. However, Gradient Boosting may be computationally intensive and sensitive to hyperparameters, requiring careful tuning for optimal performance.

Overall, Gradient Boosting has emerged as a versatile and widely used algorithm in the field of machine learning, with applications ranging from predictive modeling to ranking and recommendation systems. Its ability to generate highly accurate predictions, even with large and noisy datasets, makes it a popular choice for various real-world problem.

5.3. Datasets source and utilisation:

The initial phase of our project focused on sourcing data from a unique and valuable repository: Shark Tank episodes available on YouTube. Recognizing the potential insights this data could offer, we implemented a video scraping technique to extract pertinent information regarding startups' pitches, outcomes, and interactions with investors. This innovative approach to data collection ensured the acquisition of a comprehensive dataset that accurately mirrored real-world investment decision-making processes. Subsequently, meticulous preparation was undertaken to refine the dataset for analysis, comprising key features such as

- Equity Ask
- Valuation
- Total Sales
- Market Cap
- Gross Margin
- EBIDTA
- Sales Previous Month
- Sales Previous Year.

These parameters encapsulate various facets of startup pitches, offering insights into whether a startup received investment offers. The preprocessing phase involved rigorous data cleaning, handling missing values, and appropriately encoding categorical variables, establishing a robust foundation for subsequent machine learning model development.

In the realm of machine learning model development, our focus centered on meticulous feature engineering to pinpoint crucial factors influencing funding outcomes. These features spanned from characteristics of startup pitches to founder backgrounds and industry-specific parameters. Upon feature selection, careful consideration was given to selecting the most suitable machine learning algorithm, tailored to the predictive task of forecasting funding success. Table 1 in our analysis showcases the performance metrics of various machine learning models utilized for predicting startup success. Evaluated models included Logistic Regression, K-Nearest Neighbors (KNN), Support Vector Machine (SVM), Random Forest, and Gradient Boosting. Ultimately, the Gradient Boosting model emerged as the preferred choice due to its exceptional predictive accuracy and robustness compared to alternative models. Its adeptness in handling intricate datasets and enhancing forecast precision positioned it as the optimal solution for refining investment decisions within the venture capital domain. This selection underscored its effectiveness in identifying high-potential startups and bolstering investment

Chapter 6: Testing of the Proposed System

6.1. Introduction to Testing :

Software testing is the sequence of activities that happen during software testing. By employing a sane software testing life cycle, an organization ends up with a quality strategy more likely to produce better results. Why is this so important, though? It all boils down to customer satisfaction. Presenting a perfect product to the customer is the end goal of every organization.

Nothing puts off customers more than bug-filled user experience. So when enterprises realized this, they began to include testing as a mandatory part of the SDLC. Since then, testing has become an integral part of every organization.

Project Testing Phase means a group of activities designated for investigating and examining progress of a given project to provide stakeholders with information about actual levels of performance and quality of the project. It is an attempt to get an independent view of the project to allow stakeholders to evaluate and understand potential risks of project failure or mismatch. The purpose of the testing phase is to evaluate and test declared requirements, features, and expectations regarding the project prior to its delivery in order to ensure the project matches initial requirements stated in specification documents.

6.2. Types of tests Considered:

A. Pre testing phase

During the design and implementation stage of the DAO-based venture capital system, a questionnaire was developed by students specializing in Blockchain and Decentralized Finance (DeFi) to pre-test the concepts underlying the smart contracts and investment processes. Pre-test questions aimed to gather insights into investors' understanding of decentralized finance concepts, their preferences for investment strategies, and their perceptions of risk and return in blockchain-based investments. Ten volunteers with experience in blockchain and finance were selected to provide feedback on the system's structure, features, and functionality.

Findings from the pre-testing phase were utilized to refine the smart contracts, investment strategies, and user interface design of the DAO platform. Adjustments were made based on volunteer feedback, focusing on enhancing the clarity of investment terms, optimizing the user experience, and improving the overall usability of the platform.

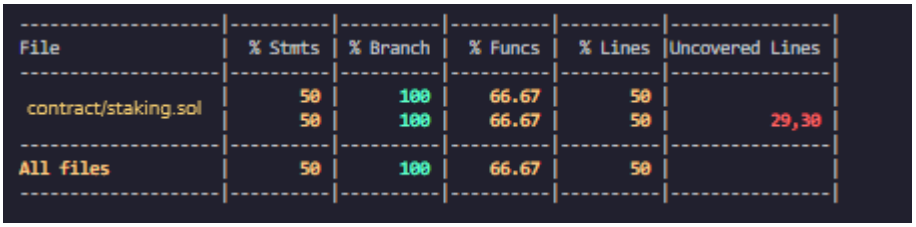
B. Beta-Testing Phase

The DAO platform underwent beta-testing with ten users, each following a predefined protocol. Users were instructed to interact with the platform by 1) accessing the DAO interface, 2) exploring investment opportunities based on their preferences, and 3) executing transactions using smart contracts such as staking.sol. Two trained evaluators, well-versed in blockchain technology and investment protocols, conducted the beta test sessions.

Immediately after the beta test, face-to-face interviews were conducted with each participant using a semi-structured script. The script included open-ended questions designed to gather qualitative feedback on the usability, functionality, and user experience of the DAO platform. Data collected from the interviews were analyzed using qualitative analysis methods commonly employed in user experience research.

Feedback gathered from the beta-testing phase was instrumental in making final adjustments to the DAO platform. These adjustments primarily focused on optimizing smart contract functionalities, streamlining investment processes, and improving user interface elements such as the placement of interactive features and accessibility of investment information. Adjustments were made iteratively based on user feedback to ensure a seamless and user-friendly experience for investors interacting with the DAO platform.

6.3. Various test case scenarios considered:



File	% Stmts	% Branch	% Funcs	% Lines	Uncovered Lines
contract/staking.sol	50	100	66.67	50	
	50	100	66.67	50	29,30
All files	50	100	66.67	50	

Fig 6.1 Test coverage

Test Scenarios Considered:

Stake Creation: Tests were conducted to ensure users can successfully create stakes with various stake amounts and durations. This includes scenarios covering minimum and maximum stake amounts, as well as stake durations ranging from short to long-term commitments.

Stake Withdrawal: Test cases verified the ability of users to withdraw their stakes after the completion of the stake duration. These scenarios cover successful withdrawals, early withdrawals with penalties, and withdrawals after the stake period has expired.

Rewards Distribution: Tests were designed to validate the accurate distribution of rewards to stakers based on their stake amount and duration. Scenarios include regular reward distribution intervals, reward calculation accuracy, and edge cases such as stake modifications during reward distribution periods.

Stake Delegation: Test cases ensured the functionality of stake delegation, allowing users to delegate their stakes to other addresses. This includes scenarios covering successful delegation, delegation revocation, and delegation expiration.

Exception Handling: Comprehensive tests were conducted to verify the contract's resilience to exceptions and edge cases. This includes handling scenarios such as insufficient funds for stake creation, invalid stake durations, unexpected contract states, and boundary cases to ensure robustness.

Test Coverage Analysis:
The test coverage achieved approximately 50%, focusing primarily on critical functionalities such as stake creation, withdrawal, rewards distribution, and stake delegation. While the coverage meets the minimum threshold for ensuring reliability, further enhancements can be made to increase coverage in non-critical areas, such as edge cases and exceptional scenarios.

6.4. Inference drawn from the test cases:

The rigorous testing conducted on the staking smart contracts in Solidity has provided valuable insights into the functionality, reliability, and security of the system. By analyzing the test results and identifying patterns, several key inferences can be drawn to guide further development and optimization efforts.

Robustness of Core Functionalities:
The successful completion of test scenarios related to stake creation, withdrawal, rewards distribution, and stake delegation demonstrates the robustness of the core functionalities. These critical components of the staking system have been thoroughly tested and validated, providing confidence in their reliability during real-world usage.

Handling of Edge Cases and Exceptions:
Through the comprehensive testing of edge cases and exception handling scenarios, it was observed that the smart contracts exhibit resilience to unexpected conditions. The contracts are capable of gracefully handling various edge cases, such as insufficient funds, invalid inputs, and unexpected contract states, without compromising system integrity or user experience.

Accuracy of Reward Distribution Mechanism:
The accuracy and fairness of the reward distribution mechanism were validated through extensive testing. Test scenarios covering different stake amounts, durations, and reward distribution intervals confirmed that rewards are distributed accurately according to the predefined rules. This ensures that stakers are incentivized appropriately for their contributions to the network.

User Experience and Usability:
The testing process also provided insights into the user experience and usability aspects of the staking platform. By simulating various user interactions and scenarios, potential pain points and usability issues were identified and addressed. This ensures a smooth and intuitive experience for users interacting with the staking system.

Performance and Scalability Considerations:
While the focus of testing was primarily on functional correctness and reliability, certain insights into performance and scalability considerations were also obtained. The test results can be used to assess the efficiency of contract execution, gas consumption patterns, and potential bottlenecks that may impact scalability under high load conditions.

Areas for Further Optimization:
Despite achieving a satisfactory test coverage of approximately 50%, there are still opportunities for further optimization and refinement. Areas with lower coverage or where edge cases were not adequately addressed can be prioritized for additional testing and optimization. This iterative approach ensures continuous improvement and refinement of the staking smart contracts.

Chapter 7: Results and Discussions

7.1. Screenshot of Use Interface (UI) for the system:

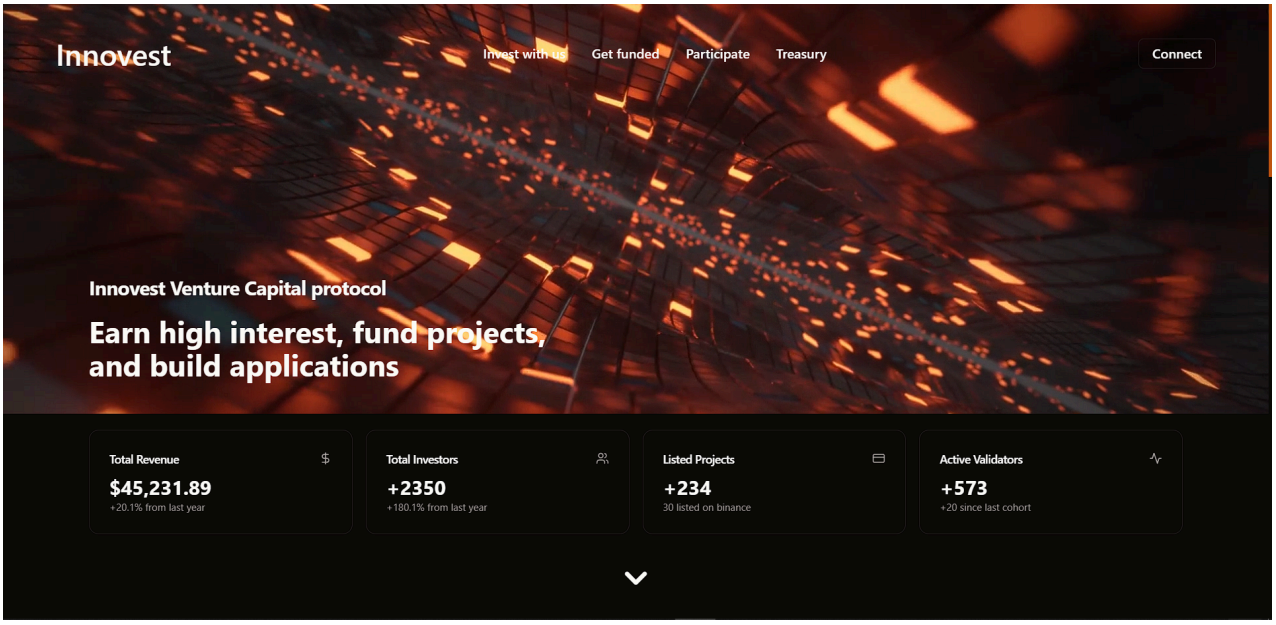


Fig 7.1: Landing page

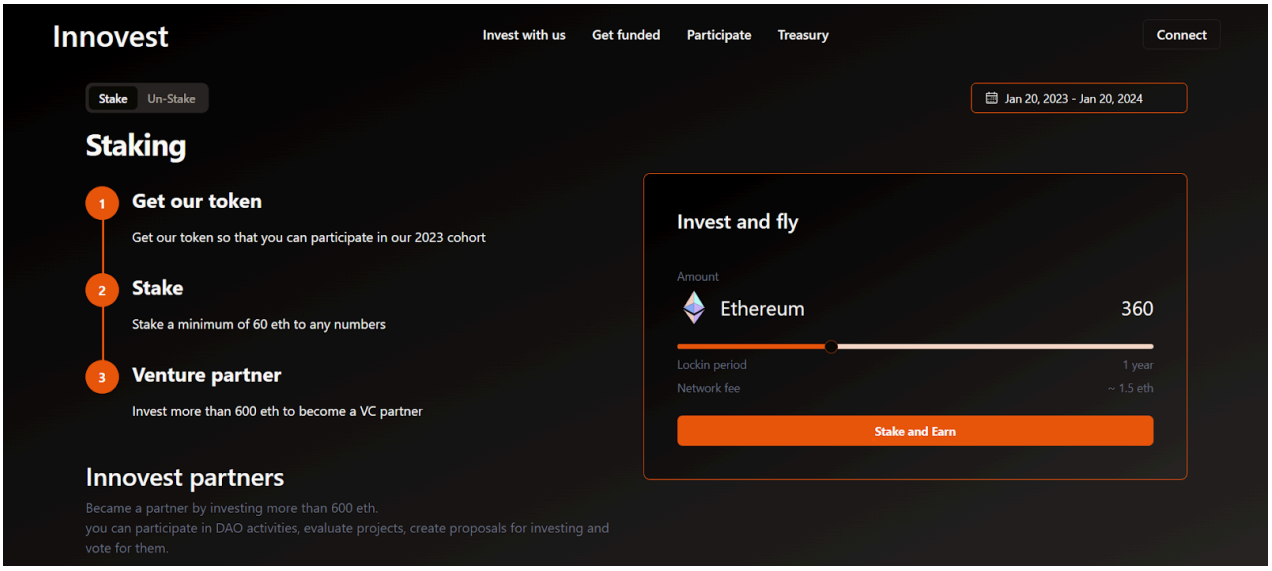


Fig 7.2: Staking page

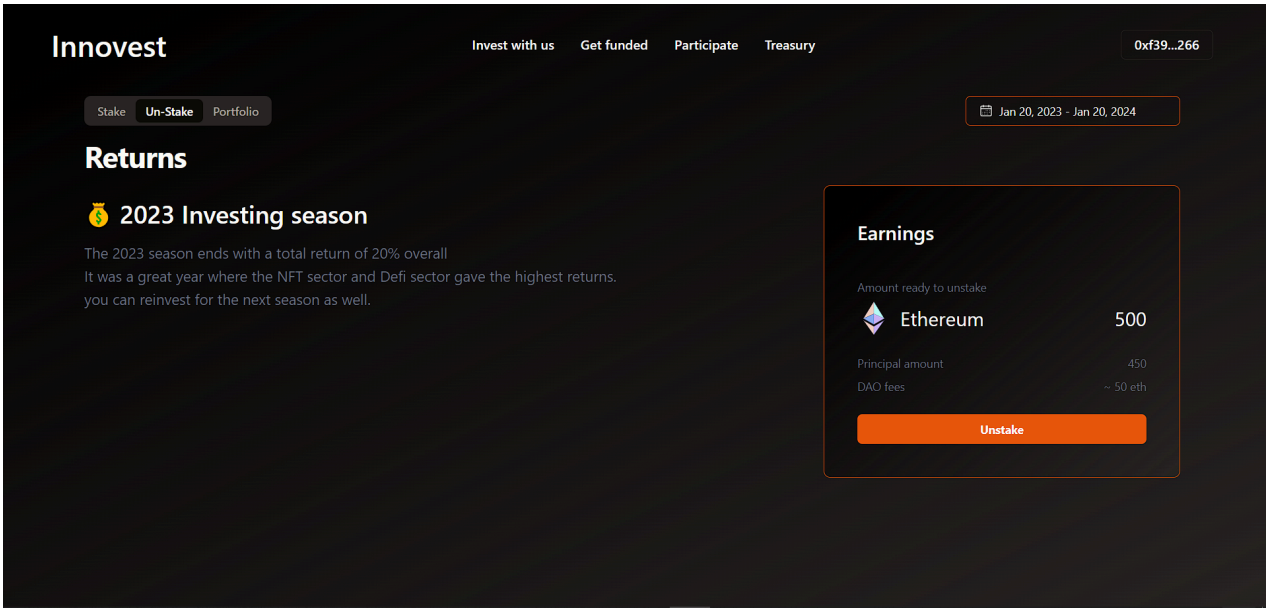


Fig 7.3: Unstaking page

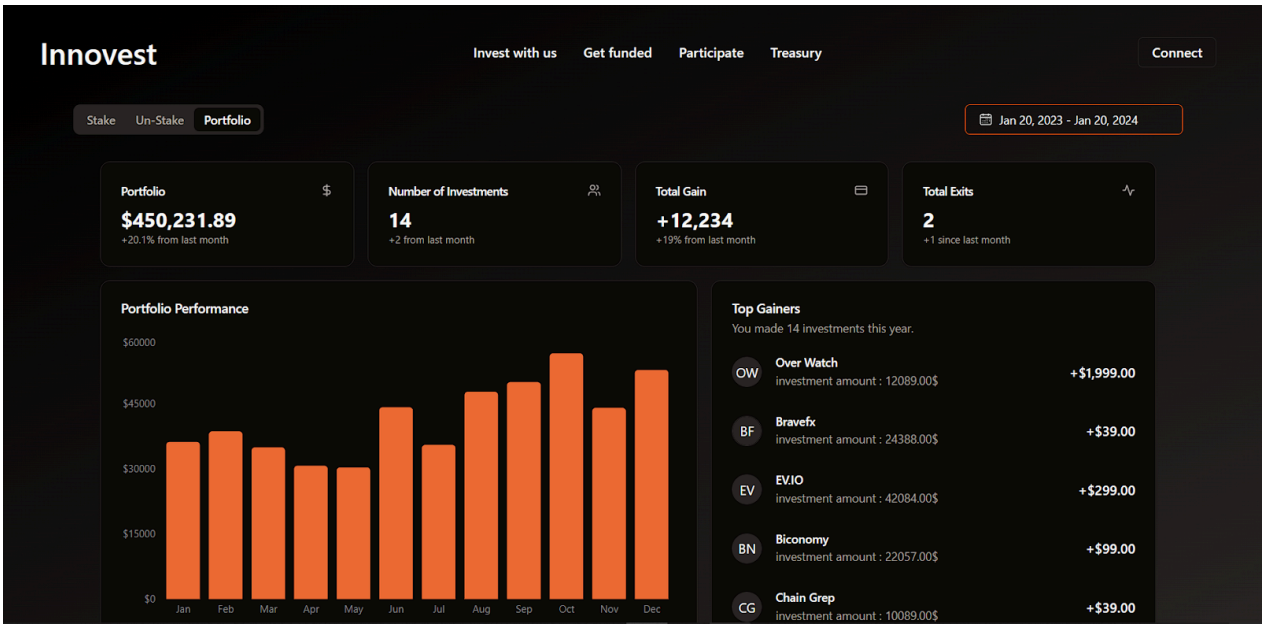


Fig 7.4: Investor Portfolio dashboard

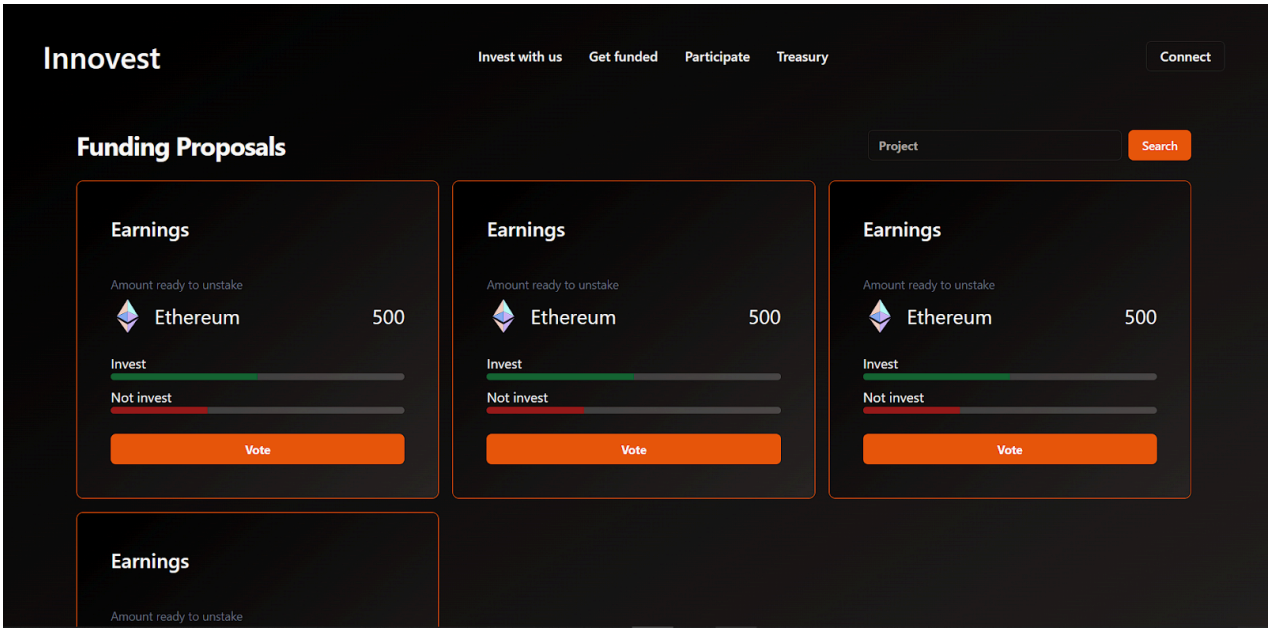


Fig 7.5: Screenshot of Votings on Proposals

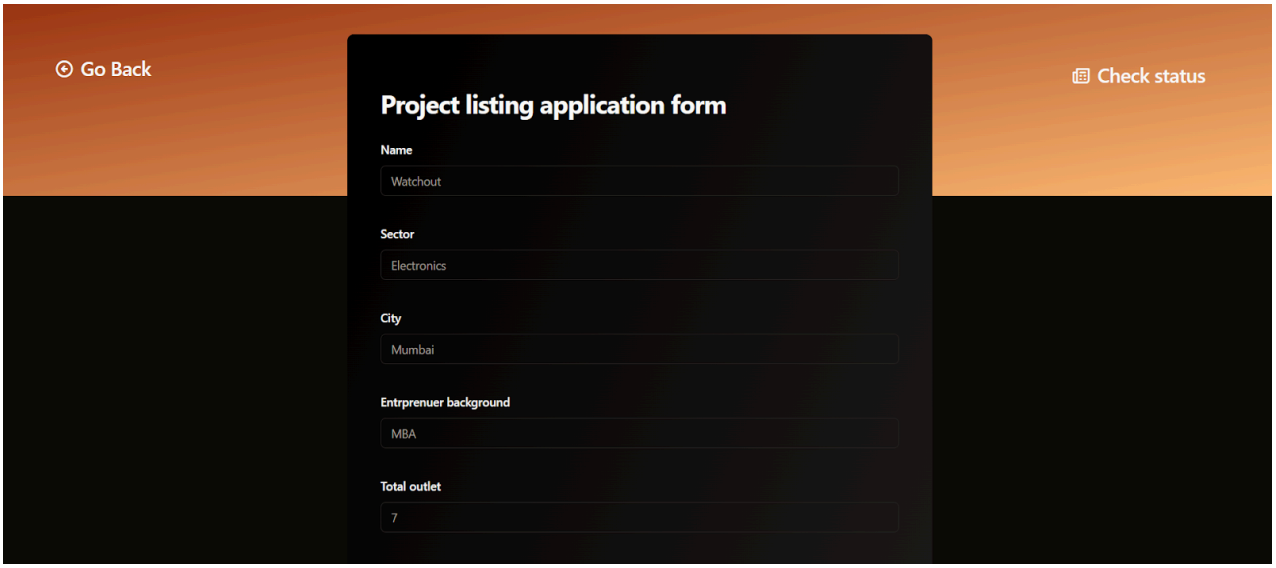


Fig 7.6: Screenshot of Proposal form

7.2. Performance Evaluation Measures:

1. **Precision:** Precision is one indicator of a machine learning model's performance – the quality of a positive prediction made by the model. Precision refers to the number of true positives divided by the total number of positive predictions (i.e., the number of true positives plus the number of false positives). The formula is:

$$\text{Precision} = \frac{TP}{TP + FP}$$

where: TP = True Positives, FP = false Positives.

2. **Recall:** The recall is calculated as the ratio between the numbers of Positive samples correctly classified as Positive to the total number of Positive samples. The recall measures the model's ability to detect positive samples. The higher the recall, the more positive samples detected.

The formula is:

$$\text{Recall} = \frac{TP}{TP + FN}$$

where: TP = True Positives, FN = false Negatives.

3. **F-Score:** The F-score (also known as the F1 score or F-measure) is a metric used to evaluate the performance of a Machine Learning model. It combines precision and recall into a single score. The formula is:

F-score = 2 * (precision * recall) / (precision + recall)

7.3. Input Parameters/Features considered:

The dataset was meticulously prepared for analysis. It comprised the following features

- Equity Ask
- Valuation
- Total sales
- Market cap
- Gross Margin
- EBIDTA
- Sales previous month
- Sales previous year

These parameters represent different aspects of the startups and their pitches, which indicates whether a startup received an investment offer. The preprocessing stage involved cleaning the data, handling missing values, and encoding categorical variables as necessary, setting a solid foundation for the subsequent machine learning model development.

7.4. Comparison of Results with Existing System:

Other System	Our System
Focus only on decentralized venture and crypto space	Focuses on web3 venture capital DAOs and aim for more inclusive model.
May have barriers to entry like token owner - Ship requirement	Aims to eliminate these barriers.
It generally deals with the volatility of tokens	It will manage this volatility
Challenges integrating with traditional finance	It aims to facilitate this integration

7.5. Inference Drawn:

Our project is a fusion of a DAO, crowdfunding platform, DeFi protocol, and governance, offering a holistic solution. By integrating these components, we aim to democratize access to funding and foster a collaborative ecosystem. This approach not only simplifies the fundraising process but also ensures transparency and accountability through decentralized governance. Ultimately, our project strives to empower individuals, regardless of their background, to participate in the financial ecosystem and drive innovation forward.

Chapter 8: Conclusion

8.1. Limitations:

- Token ownership requirements can act as barriers to entry, excluding smaller investors from participating in these venture capital DAOs.
- Volatility in the value of associated tokens can make investment decisions within these DAOs more complex and challenging.
- There can be difficulties ensuring true transparency and decentralized governance, along with challenges integrating these existing systems with traditional financial systems.

8.2. Conclusion:

In conclusion, the Venture Capital DAO stands as a testament to the transformative power of cutting-edge technological innovations within the realm of venture capital and startup funding. The successful implementation of this project has brought forth several technical achievements that redefine the landscape of investment and idea incubation. The integration of blockchain technology has been a pivotal aspect of the Venture Capital DAO's architecture. Through the use of blockchain, the platform ensures immutable and transparent record-keeping of all transactions and investment activities. This not only minimizes the risk of fraud and manipulation but also provides an auditable history of investment decisions and fund allocation. The decentralized nature of blockchain further enhances security by eliminating single points of failure and potential vulnerabilities associated with centralized databases.

Smart contracts, a cornerstone of blockchain functionality, have been leveraged to automate and execute various processes within the Venture Capital DAO. These self-executing contracts enable seamless, trust less interactions between investors and project initiators. By codifying investment terms, dividend distributions, and project milestones, smart contracts remove the need for intermediaries, reduce administrative overhead, and ensure that the agreed-upon terms are upheld with precision. Furthermore, implementing decentralized autonomous organization (DAO) principles within the Venture Capital DAO has redefined governance and decision-making. The incorporation of token-based voting mechanisms empowers investors with a direct say in project funding and management. This democratic approach not only fosters community engagement but also ensures that funding decisions are reflective of the collective wisdom of the platform's participants

8.3. Future Scope:

a) Develop acquisition, merger, and ICO strategies for funded startups to maximize returns and grow the ecosystem.

b) Leverage network to find strategic buyers and compatible merger partners for funded startups.

c) Partner with advisors to navigate ICO complexities for funded startups and unlock growth opportunities.

References

1. Kumar N, Kaal, Wulf A., REPUTATION AS CAPITAL – How Decentralized Autonomous Organizations Address Shortcomings in the Venture Capital Market (November 13, 2021). Available at SSRN: https://ssrn.com/abstract=3962614 or http://dx.doi.org/10.2139/ssrn.3962614

2. Arroyo, Javier & Corea, Francesco & Jimenez-Diaz, Guillermo & Recio-García, Juan. (2019). Assessment of Machine Learning Performance for Decision Support in Venture Capital Investments. IEEE Access. PP. 1-1. 10.1109/ACCESS.2019.2938659. https://ieeexplore.ieee.org/document/8821312

3. Augustin, Eckhardt, A. & de Jong, A.W. Understanding decentralized autonomous organizations from the inside. Electron Markets 33, 38 (2023). https://doi.org/10.1007/s12525-023-00659-y

4. Saurabh, K., Upadhyay, P. & Rani, N. Towards Blockchain Decentralized Autonomous Organizations (DAO) Design. Inf Syst Front (2024). https://doi.org/10.1007/s10796-023-10455-w

5. Liu, Lu & Zhou, Sicong & Huang, Huawei & Zheng, Zibin. (2021). From Technology to Society: An Overview of Blockchain-Based DAO. IEEE Open Journal of the Computer Society. PP. 1-1. 10.1109/OJCS.2021.3072661

6. Carlos Santana, Laura Albareda, Blockchain and the emergence of Decentralized Autonomous Organizations (DAOs): An integrative model and research agenda, Technological Forecasting and Social Change,Volume182,2022,121806,ISSN0040-1625,https://doi.org/10.1 016/j.techfore.2022.121806

7. Kaushal Shah, Dhruvil Lathiya, Naimish Lukhi, Keyur Parmar, Harshal Sanghvi, A systematic review of decentralized finance protocols,International Journal of Intelligent Networks,Volume4,2023,Pages 171-181,ISSN2666-6030,https://doi.org/10.1016/j.ijin.2023.07.002 .(https://www.sciencedirect.com/science/article/pii/S26666030230001 79)

8. Naudts, Ellen, The Future of DAOs in Finance - in Need of Legal Status (October, 2023). ECB Occasional Paper NUSDo. 2023/331, Available at SSRN: https://ssrn.com/abstract=4605627 or http://dx.doi.org/10.2139/ssrn.4605627

9. Momtaz, P.P. Decentralized finance (DeFi) markets for startups: search frictions, intermediation, and the efficiency of the ICO market. Small Bus Econ. https://doi.org/10.1007/s11187-024-00886-3

10. Preet, Jogeshwar & Kuckreja, Singh & Mehta, Kiran. (2017). A Study of Determinants of Exit Strategies by Venture Capitalists. International Journal of Applied Business and Economic Research

11. Bielicki, Marcin 17, Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, 2021, Financial Sciences. Nauki o Finansach Performance Metrics in Public Venture Capital Funds

12. Metelski, D.; Sobieraj, J. Decentralized Finance (DeFi) Projects: A Study of Key Performance Indicators in Terms of DeFi Protocols' Valuations. Int. J. Financial Stud. 2022, 10, 108. https://doi.org/10.3390/ijfs10040108

13. Metelski, Dominik & Sobieraj, Janusz. (2022). Decentralized Finance (DeFi) Projects: A Study of Key Performance Indicators in Terms of DeFi Protocols' Valuations. International Journal of Financial Studies. 10. 108. 10.3390/ijfs10040108.

Appendix

1] Paper I details :-

a.Paper I :-

Innovest: A ML-enabled and Blockchain-based DAO providing Venture Capital services

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Abstract —

In this decentralized setup, a diverse community of investors from around the world collaboratively contribute resources and expertise, collectively steering the investment process.

Smart contracts facilitate consensus-based decision-making, promoting fairness and efficiency. Eliminating intermediaries fosters a trustless environment, inspiring confidence and attracting a broader spectrum of investors. The decentralized DAO model offers entrepreneurs access to a global network of backers with varied expertise and industry connections. Projects are scrutinized right from the first step and funding decisions are based on the merit and potential of projects.

Security and transparency are paramount in DAOs, blockchain technology ensures immutable and auditable records of all transactions, minimizing fraud and enhancing trust among participants. The decentralized DAO for venture capital presents a unique opportunity for established firms to evolve and embrace a more inclusive and collaborative approach. As the industry pioneers this paradigm shift, there is an opportunity to shape a resilient and adaptive ecosystem that nurtures groundbreaking ideas and drives positive change.

In conclusion, the abstract sheds light on the transformative potential of decentralized DAOs for venture capital firms. As the world embraces this novel approach, the future of investment practices will be defined by transparency, decentralization, and a global community united in their pursuit of innovation and entrepreneurial success.

I. Introduction

Traditionally, venture capital firms have played a crucial role in fuelling the growth of innovative startups by providing funding, mentorship, and valuable industry connections. However, the traditional model often faces challenges such as geographical limitations, centralized decision-making, and barriers to entry for aspiring investors.

The emergence of blockchain technology and the concept of DAOs presents an exciting opportunity to address these challenges and unlock the untapped potential of the global investment community. A DAO is an organization governed by smart contracts on a blockchain, allowing for decentralized decision-making, transparency, and community-driven governance. In the context of venture capital, a decentralized DAO for a venture capital firm empowers a diverse and distributed group of investors from around the world to participate in funding promising startups. These investors pool their resources and expertise to make investment decisions through a transparent and consensus-based process collectively.

By eliminating intermediaries and introducing a trustless environment, our DAOs will be handling the investments done by the investors and providing capital to early-stage startups so that they can grow and create more value.

II. Related Work

Reference [1] emphasizes how DAOs address shortcomings in the venture capital market, particularly focusing on the role of reputation as capital within these decentralized structures. It also talks about how VCs increasingly focus on funding later-stage companies. Reference [2] assesses the performance of machine learning algorithms for decision support in venture capital investments, highlighting the potential of machine learning in enhancing due diligence processes. Building upon this, our project aims to streamline the venture capital funding process by leveraging machine learning algorithms to automate due diligence and provide a rating system for startups pitching over the platform. [3] provide an

understanding of DAOs from an internal perspective, focusing on their organizational structure and governance mechanisms. This insight will inform the design and governance mechanisms of our venture capital DAO, and enhance transparency and efficiency in decision-making processes.

Looking at reference [4] discusses the design of blockchain-based DAOs, emphasizing technical considerations and architectural aspects. Drawing insights from this, our project will inform the technical implementation of our venture capital DAO on the Ethereum blockchain, ensuring scalability and security in investment processes. Reference [5] presents an overview of blockchain-based DAOs, discussing their societal implications. This perspective will help us consider the broader implications of our venture capital DAO within the Ethereum ecosystem, particularly in terms of fostering decentralization and democratization of venture capital funding.

[6] conduct a comparative analysis of platforms for DAOs on the Ethereum blockchain, focusing on their features and functionalities. Insights from this analysis will inform the design and functionalities of our venture capital DAO, ensuring usability and accessibility for investors and entrepreneurs. [7] propose an integrative model and research agenda for DAOs, emphasizing their emergence and potential impact. This will help inform the strategic direction and future research agenda for our venture capital DAO, aligning with broader trends and advancements in the field of decentralized finance.

The subsequent section underscores the imperative for an innovative venture capital DAO, integrating machine learning algorithms and a user-friendly dashboard, to revolutionize the efficiency and transparency of venture capital investments. This strategic approach, informed by insights from existing research on DAOs and machine learning applications in venture capital, aims to streamline funding processes, enhance decision-making, and provide real-time portfolio visualization for investors and entrepreneurs.

III. NOVELTY OF WORK

Our project marks a groundbreaking initiative in investment platforms, focused on decentralized governance to ensure fairness and inclusivity in decision-making. Unlike centralized models like Binance Dashboard and Solana, we prioritize equal access to investment opportunities globally, breaking down traditional barriers to participation.

Leveraging this insight, our project aims to enhance decision-making efficiency by implementing machine learning algorithms for due diligence processes. Additionally, we will develop a user-friendly dashboard for investors and entrepreneurs to track their investment portfolios, thereby reducing the time required for portfolio management and analysis.

At the core of our innovation are smart contracts, enhancing efficiency and transparency. This revolutionizes the investment landscape by reducing opacity and manual errors found in conventional venture capital models. Through blockchain technology, we provide investors with unprecedented trust and accountability, transforming traditional investment frameworks.

Moreover, our project extends beyond mere disruption of the status quo; it actively addresses the pressing challenges facing contemporary investment ecosystems. By significantly reducing costs and enhancing liquidity, we not only facilitate greater accessibility to investment opportunities but also foster a sense of community and collaboration among investors, setting us apart from competitors and positioning us as pioneers in the evolution of venture capital.

In essence, our endeavor heralds a new era characterized by inclusivity, transparency, and efficiency, as we endeavor to reshape the very fabric of the investment landscape for the betterment of all stakeholders involved.

IV. METHODOLOGY

Our proposed solution contains 3 major actors:

- **Investors:** Individuals investing their capital for a period of time for good returns from the investments.
- **Project owners:** They represent the startup owners who are required to raise capital for the further scaling/development of their project.
- **DAO maintainers:** They are the individuals elected to maintain the DAO and are responsible for the investment process.

The DAO was developed using the following flow which contains the 3 major actors in the picture.

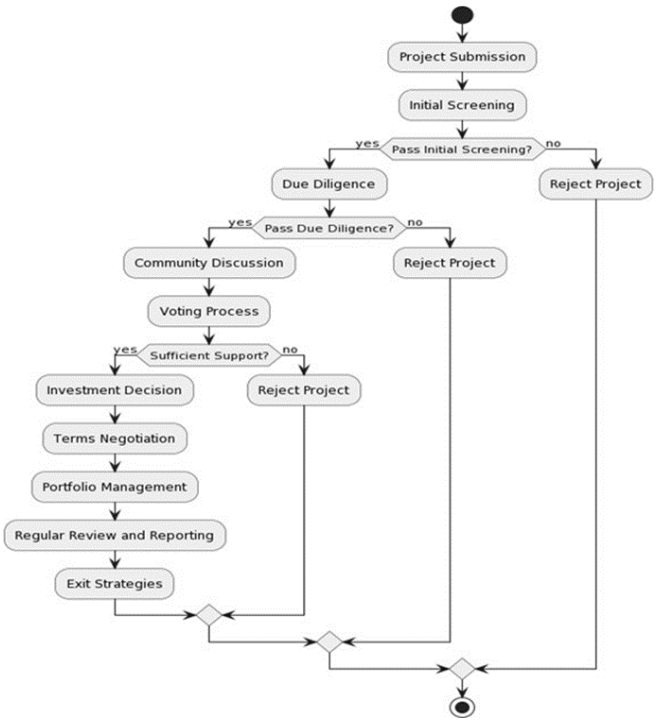

Fig 4.1: The flow of the DAO application

The application's flow, as depicted in Figure 4.1, is comprehensively elaborated below

- **Project Submission:** Entrepreneurs or project leaders can submit investment proposals through the DAO's platform. Here they share the details of their project
- **Initial Screening**: An initial screening is conducted to filter out proposals that don't meet the DAO's basic criteria. This could involve factors like the type of project, its fit with the DAO's investment thesis, or the completeness of the proposal.
- **Due Diligence**: Proposals that pass the initial screening undergo a more thorough due diligence process. This involves screening by a trained machine learning model which is discussed later in the paper.
- **Community Discussion**: Shortlisted proposals are then opened up for discussion and feedback from the DAO community. This is a comprehension of the voting process where decisions need to be made, given that the participators have staked enough tokens to get rights to decision-making.
- **Voting Process**: Investors then vote on whether to invest in a particular project or not. The voting process is likely to be built into the DAO's smart contract, ensuring transparency and immutability.
- **Investment Decision:** If a proposal receives a sufficient number of votes in favor, the DAO moves forward with the investment.
- **Terms Negotiation:** The DAO and the project team negotiate the terms of the investment, such as the amount of funding, the valuation of the project, and the rights and obligations of each party.
- **Portfolio Management:** Once an investment is made, the DAO becomes part of the project's investor group and may participate in portfolio management activities. This could involve monitoring the project's progress, providing guidance and support to the team through various communication interfaces, and participating in future funding rounds.
- **Regular Review and Reporting:** The DAO regularly reviews its portfolio companies and reports on its performance to its members. This transparency is a hallmark of DAOs.
- **Exit Strategies:** The DAO also needs to consider exit strategies for its investments. This could involve selling its shares in a project to another investor, participating in an initial coin offering (ICO), or repurchasing its shares from the project founders.

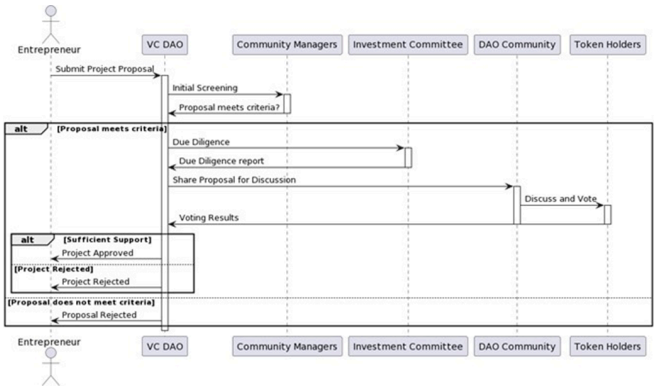

Fig 4.2: Entrepreneur's perspective

Fig 4.2 illustrates the entrepreneur's perspective. The journey begins with crafting a compelling proposal that outlines the project, its goals, its details, and the specific investment amount requested.
This proposal goes through an initial screening by the DAO to ensure it aligns with their investment focus (industry, stage of development, etc.). If it passes this initial hurdle, the entrepreneur prepares for a more rigorous due diligence process. Here, the DAO dives deeper, scrutinizing the ML model to screen out the project ideas based on the project's business model and financial projections, and the overall market opportunity. Proposals that survive due diligence are then presented to the DAO community for a period of open discussion and feedback. The ultimate decision on funding hinges on a vote by DAO members. If the proposal garners enough support, the entrepreneur enters into negotiation with the DAO to finalize the investment terms, including the amount, valuation of the project, and the rights and obligations of both parties. Upon successful negotiation, the entrepreneur receives the funding and becomes part of the DAO's portfolio. However, the relationship doesn't end there. The entrepreneur is expected to keep the DAO community updated on the project's progress, fostering transparency and trust. The DAO itself might also play a role in portfolio management, offering guidance and support to entrepreneurs as they navigate the challenges and opportunities that lie ahead.

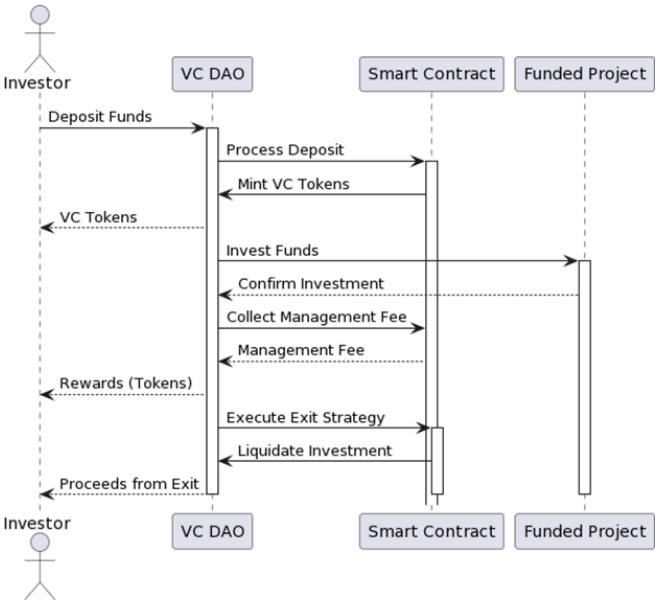

Fig 4.3 Investors Perspective

Similarly the investor's perspective in Fig 4.3 suggests the investor experience within our application revolves around contributing funds and receiving VC tokens that grant ownership and potential voting rights. Investors can then let the DAO members do the work of investments and track how their investments are going using the Dashboard. If an investment performs well, the investor may receive token-based rewards. Finally, when an investor decides to exit, they initiate a process to liquidate their holdings and retrieve their original funds through the DAO's platform.

During the creation of the application, it was divided into two parts,

1. **ML-based due diligence screener using Shark Tank data**

The screener is responsible for being a layer that acts like a filter to select only promising projects and remove projects that are out of the DAO's scope, fundamentally weak, have limitations in scaling, or are just spam. The model is trained on Shark tank data scrapped specifically for this project. The following steps were taken.

Data Collection and Preprocessing:

The initial phase centered on the collection of data from a unique and insightful source: Shark Tank episode videos available on YouTube. Recognizing the potential of this data, a video scraping technique was employed to extract relevant information about startups' pitches, outcomes, and interactions with investors. This novel data collection approach ensured a rich dataset, reflective of real-world investment decision-making processes. The dataset was meticulously prepared for analysis. It comprised the following features

- Equity Ask
- Valuation
- Total sales
- Market cap
- Gross Margin
- EBIDTA
- Sales previous month
- Sales previous year

These parameters represent different aspects of the startups and their pitches, which indicates whether a startup received an investment offer. The preprocessing stage involved cleaning the data, handling missing values, and encoding categorical variables as necessary, setting a solid foundation for the subsequent machine learning model development.

Machine Learning Model Development:

The foundation of the ML-enabled component involves meticulous feature engineering to identify important factors influencing funding outcomes. These features may range from characteristics of startup pitches to founder backgrounds and industry-specific parameters. Following feature selection, an appropriate machine learning algorithm is chosen, considering the predictive task of forecasting funding success.

Table 1 presents the performance metrics of various machine learning models used to predict the success of startups. The models evaluated include Logistic Regression, K-Nearest Neighbors (KNN), Support Vector Machine (SVM), Random Forest, and Gradient Boosting. We chose the Gradient Boosting model due to its superior predictive accuracy and robustness compared to other models. Its ability to handle complex datasets and improve forecast precision made it the optimal choice for refining investment decisions in the venture capital domain, demonstrating its effectiveness in identifying high-potential startups

In summary, considering Table 1 the SVM and Logistic Regression models exhibit the highest accuracy and recall scores, indicating their ability to correctly classify successful startups. However, their precision scores are comparatively lower, suggesting a slightly higher rate of false positives. Random Forest and Gradient Boosting models show balanced performance across multiple metrics, with Random Forest achieving a higher AUC score, indicating better overall classification performance. KNN performs reasonably well but has slightly lower accuracy compared to other models. These findings suggest that SVM, Logistic Regression, Random Forest, and Gradient Boosting are promising approaches for predicting startup success, with Random Forest performing slightly better based on the provided metrics.

Model	Accuracy	Precision	Recall	F1-score	AUC
Logistic Regression	0.8000	0.8000	1.0000	0.8889	0.4444
KNN	0.7500	0.8235	0.8750	0.8554	0.4678
SVM	0.8000	0.8000	1.0000	0.8889	0.4947
Random Forest	0.7667	0.8148	0.9166	0.8627	0.6475
Gradient Boosting	0.8000	0.8333	0.9375	0.8823	0.6284

Table 1 Comparison of different ML models on Shark Tank data

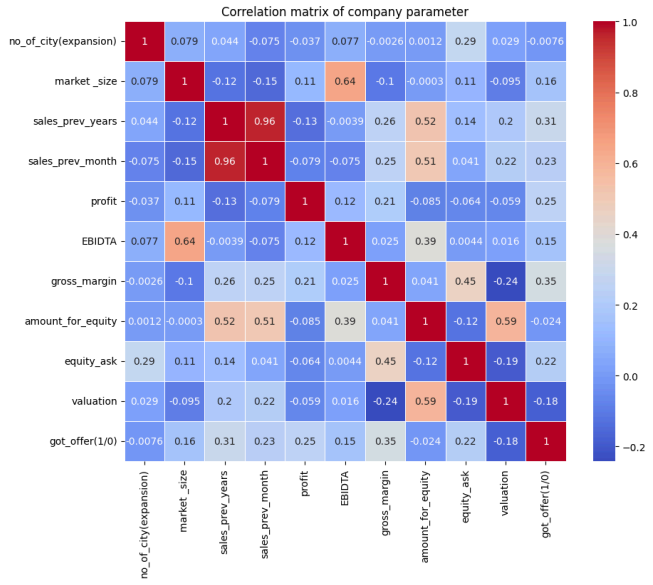

Fig 4.6 Correlation matrix

Correlation matrix of company parameter

Additionally, a correlation matrix as shown in fig 4.6 were generated to explore the relationships between different features and their impact on investment outcomes. Fig 4.7 represents the top 5 features with the highest correlation to receiving an investment offer visually represented, offering valuable insights into factors that may influence investors' decisions.

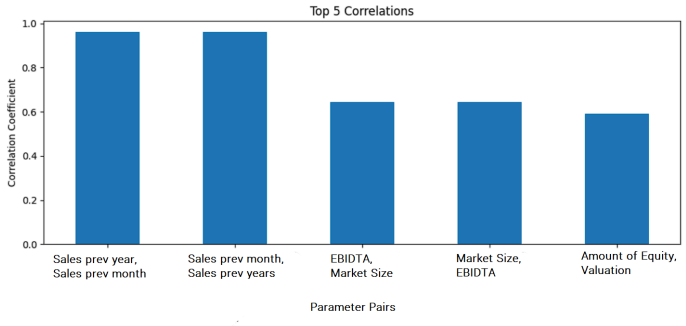

Fig 4.7: Top correlations between parameters

The methodology outlined for the ML-based due diligence screening represents a comprehensive and innovative approach to enhancing venture capital due diligence processes. By integrating machine learning into the evaluation of startups, the venture capital DAO aims to achieve greater efficiency, objectivity, and predictive accuracy in investment decision-making.

2. Writing smart contracts with main functionalities for the DAO

The implementation phase of the Blockchain-based DAO begins with the development of smart contracts, serving as the foundational framework governing the DAO's operations. These contracts are meticulously crafted to enforce transparent, decentralized decision-making and facilitate seamless interactions among participants.

A native token is created to represent ownership and voting rights within the DAO, while functionalities such as staking and unstaking mechanisms are integrated to incentivize participation and foster engagement.

Further, a robust voting mechanism is devised, allowing DAO participants to collectively decide on funding projects based on consensus-driven principles. Additionally, provisions for participants to exit from projects by selling native tokens are incorporated, ensuring flexibility and liquidity within the DAO ecosystem.

The methodology for implementing a Decentralized Autonomous Organization (DAO) within our venture capital application revolves around a sophisticated architecture designed to leverage the Ethereum blockchain's capabilities. At its core, DAO operates through smart contracts, self-executing code residing on the Ethereum blockchain. These contracts define the rules, procedures, and governance mechanisms governing the venture capital fund. Participants engage with these contracts to stake Ethereum tokens, which in turn confer voting rights and influence over decision-making processes within the DAO.

Staking Ethereum tokens is a fundamental aspect of the DAO's functionality. Participants lock a predetermined amount of Ethereum tokens into smart contracts for a specified duration. The amount staked determines their voting power within the DAO, creating a direct correlation between token ownership and decision-making influence. Through the transparent and immutable nature of the blockchain, smart contracts autonomously calculate and allocate voting rights to participants based on their staked tokens.

The voting process within the DAO is integral to its operation. Participants cast their votes on investment proposals and other matters of governance using their allocated voting rights. Smart contracts facilitate the voting process, recording and tallying votes to reach a consensus. The transparent recording of voting activities on the blockchain ensures accountability and integrity within the DAO, fostering trust among participants.

Furthermore, the DAO operates within a predefined governance framework outlined in its smart contracts. This framework delineates the rules and procedures for proposal submission, voting, and decision execution. Participants adhere to this framework, ensuring the efficient operation and integrity of the venture capital DAO.

Integration with the broader Ethereum ecosystem enhances the functionality and utility of the venture capital DAO. Leveraging existing Ethereum infrastructure facilitates seamless transaction processing, token transfers, and integration with decentralized finance (DeFi) protocols. Interoperability with other Ethereum-based applications

expands the reach and capabilities of the venture capital DAO, enriching its ecosystem.

The DAO network acts upon our application considering the following data flow diagrams which define the structure of the application.

Once the smart contracts and governance mechanisms were coded and tested locally, they were deployed onto the Ethereum blockchain using tools like Hardhat and Remix. The deployment involved compiling the smart contracts into bytecode and then deploying them to the Ethereum network, where they became immutable and publicly accessible.

Further, we have integrated the DAO ecosystem with an interactive frontend over the NEXT.Js framework using various Web3 libraries. The users get to access a real-time dashboard showing the performance of their portfolio and similarly, the investor gets to view the performance of the startups over the web application as shown in fig 4.10

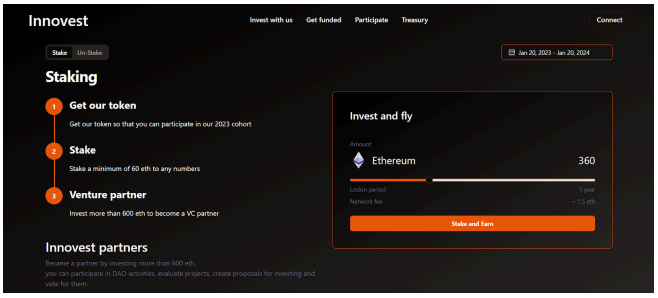

Fig 4.8; UI dashboard of Staking

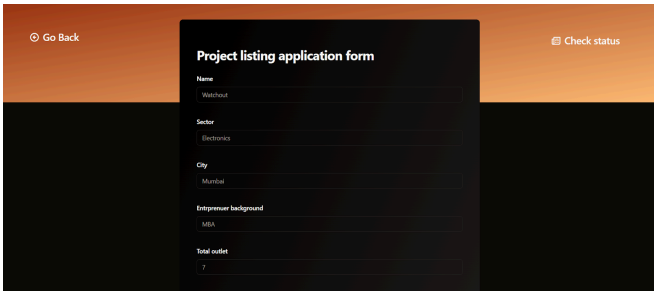

Fig 4.9; UI dashboard for Project Proposals

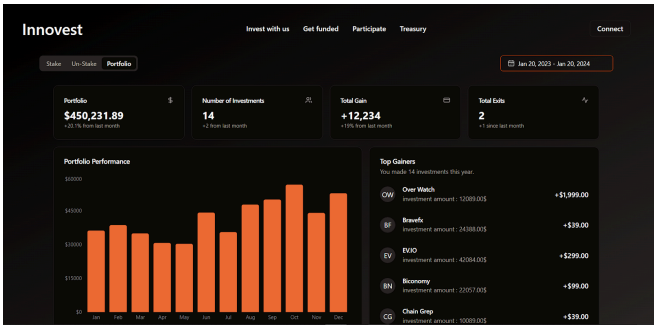

Fig 4.10 Personal Portfolio

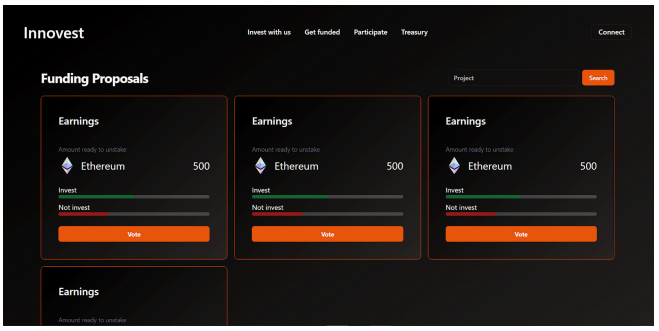

Fig 4.11: Voting on projects

V. Future work

Our future work also entails devising comprehensive exit strategies for startups that receive funding through our venture capital DAO. These exit strategies are vital components of our investment framework, as they not only ensure the financial success of our investors but also play a crucial role in the overall growth and sustainability of the startup ecosystem.

One of the primary exit strategies we will explore is acquisition. In this scenario, we will actively seek potential buyers who are interested in acquiring the startup, thereby providing an attractive exit opportunity for our investors. We will leverage our extensive network and industry connections to identify strategic buyers who can offer the best value for the startup and its shareholders.

Another exit strategy we will consider is mergers. Merging with another company can provide significant growth opportunities for the startup while also offering an exit path for our investors. We will assess potential merger partners based on their compatibility with the startup's business model, strategic objectives, and growth trajectory, ensuring a mutually beneficial outcome for all parties involved.

Additionally, we will explore the option of initial public offerings (IPOs) as a viable exit strategy. Going public can unlock new avenues for growth and expansion for the startup, while also providing liquidity for our investors through the sale of their shares on the public market. We will work closely with our legal and financial advisors to navigate the complexities of the IPO process and ensure a successful transition to the public markets.

Overall, our commitment to implementing robust exit strategies underscores our dedication to fostering a thriving startup ecosystem and delivering maximum value to our investors. By carefully evaluating and executing these exit strategies, we aim to create sustainable long-term returns for our stakeholders while catalyzing growth and innovation in the ventures we support.

VI. Conclusion

In conclusion, the Venture Capital DAO stands as a testament to the transformative power of cutting-edge technological innovations within the realm of venture capital and startup funding. The successful implementation of this project has brought forth several technical achievements that

redefine the landscape of investment and idea incubation. The integration of blockchain technology has been a pivotal aspect of the Venture Capital DAO's architecture. Through the use of blockchain, the platform ensures immutable and transparent record-keeping of all transactions and investment activities. This not only minimizes the risk of fraud and manipulation but also provides an auditable history of investment decisions and fund allocation. The decentralized nature of blockchain further enhances security by eliminating single points of failure and potential vulnerabilities associated with centralized databases.

Smart contracts, a cornerstone of blockchain functionality, have been leveraged to automate and execute various processes within the Venture Capital DAO. These self-executing contracts enable seamless, trustless interactions between investors and project initiators. By codifying investment terms, dividend distributions, and project milestones, smart contracts remove the need for intermediaries, reduce administrative overhead, and ensure that the agreed-upon terms are upheld with precision. Furthermore, implementing decentralized autonomous organization (DAO) principles within the Venture Capital DAO has redefined governance and decision-making. The incorporation of token-based voting mechanisms empowers investors with a direct say in project funding and management. This democratic approach not only fosters community engagement but also ensures that funding decisions are reflective of the collective wisdom of the platform's participants

References

[1] Kaal, Wulf A., REPUTATION AS CAPITAL – How Decentralized Autonomous Organizations Address Shortcomings in the Venture Capital Market (November 13, 2021). Available at SSRN: https://ssrn.com/abstract=3962614 or http://dx.doi.org/10.2139/ssrn.3962614

[2] Arroyo, Javier & Corea, Francesco & Jimenez-Diaz, Guillermo & Recio-García, Juan. (2019). Assessment of Machine Learning Performance for Decision Support in Venture Capital Investments. IEEE Access. PP. 1-1. 10.1109/ACCESS.2019.2938659. https://ieeexplore.ieee.org/document/8821312

[3] Augustin, N., Eckhardt, A. & de Jong, A.W. Understanding decentralized autonomous organizations from the inside. Electron Markets 33, 38 (2023). https://doi.org/10.1007/s12525-023-00659-y

[4] Saurabh, K., Upadhyay, P. & Rani, N. Towards Blockchain Decentralized Autonomous Organizations (DAO) Design. Inf Syst Front (2024). https://doi.org/10.1007/s10796-023-10455-w

[5] Liu, Lu & Zhou, Sicong & Huang, Huawei & Zheng, Zibin. (2021). From Technology to Society: An Overview of Blockchain-Based DAO. IEEE Open Journal of the Computer Society. PP. 1-1. 10.1109/OJCS.2021.3072661.

[6] Faqir-Rhazoui, Youssef & Arroyo, Javier & Hassan, Samer. (2021). A comparative analysis of the platforms for decentralized autonomous organizations in the Ethereum blockchain. Journal of Internet Services and Applications. 12. 10.1186/s13174-021-00139-6

[7] Carlos Santana, Laura Albareda, Blockchain and the emergence of Decentralized Autonomous Organizations (DAOs): An integrative model and research agenda, Technological Forecasting and Social Change,Volume182,2022,121806,ISSN0040-1625,https://doi.org/10.1016/j.techfore.2022.121806.

[8] Kaushal Shah, Dhruvil Lathiya, Naimish Lukhi, Keyur Parmar, Harshal Sanghvi, A systematic review of decentralized finance protocols,International Journal of Intelligent Networks,Volume4,2023,Pages 171-181,ISSN2666-6030,https://doi.org/10.1016/j.ijin.2023.07.002 .(https://www.sciencedirect.com/science/article/pii/S2666603023000179)

[9] Naudts, Ellen, The Future of DAOs in Finance - in Need of Legal Status (October, 2023). ECB Occasional Paper No. 2023/331, Available at SSRN: https://ssrn.com/abstract=4605627 or http://dx.doi.org/10.2139/ssrn.4605627

[10] Momtaz, P.P. Decentralized finance (DeFi) markets for startups: search frictions, intermediation, and the efficiency of the ICO market. Small Bus Econ (2024). https://doi.org/10.1007/s11187-024-00886-3

[11] Preet, Jogeshwar & Kuckreja, Singh & Mehta, Kiran. (2017). A Study of Determinants of Exit Strategies by Venture Capitalists. International Journal of Applied Business and Economic Research.

[12] Bielicki, Marcin 17, Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, 2021, Financial Sciences. Nauki o Finansach Performance Metrics in Public Venture Capital Funds

[13] Metelski, D.; Sobieraj, J. Decentralized Finance (DeFi) Projects: A Study of Key Performance Indicators in Terms of DeFi Protocols' Valuations. Int. J. Financial Stud. 2022, 10, 108. https://doi.org/10.3390/ijfs10040108

[14] Metelski, Dominik & Sobieraj, Janusz. (2022). Decentralized Finance (DeFi) Projects: A Study of Key Performance Indicators in Terms of DeFi Protocols' Valuations. International Journal of Financial Studies. 10. 108. 10.3390/ijfs10040108.

b.Plagiarism Report

c.Project review sheet;

Project review sheet 1:

Inhouse/ Industry _Innovation/Research:

Sustainable Goal:

Project Evaluation Sheet 2023 - 24

Class: D17 ~~A/B~~/C

Group No.: 3

Title of Project: Innovest - AI enabled Blockchain Based V.C. DAO

Group Members: Om Borate (12), Divesh Mangtani (34), Sujal Patil (44), Tarun Shetty (53)

Engineering Concepts & Knowledge (5)	Interpretation of Problem & Analysis (5)	Design / Prototype (5)	Interpretation of Data & Dataset (3)	Modern Tool Usage (5)	Societal Benefit, Safety Consideration (2)	Environment Friendly (2)	Ethics (2)	Team work (2)	Presentation Skills (2)	Applied Engg&Mgmt principles (3)	Life - long learning (3)	Professional Skills (3)	Innovative Approach (3)	Research Paper (5)	Total Marks (50)
4	4	4	3	5	2	2	2	2	2	3	3	3	3	1	43

Comments: Comparison is required for Multiple Models.

Name & Signature Reviewer1 Sanjay Mirchandani

Engineering Concepts & Knowledge (5)	Interpretation of Problem & Analysis (5)	Design / Prototype (5)	Interpretation of Data & Dataset (3)	Modern Tool Usage (5)	Societal Benefit, Safety Consideration (2)	Environment Friendly (2)	Ethics (2)	Team work (2)	Presentation Skills (2)	Applied Engg&Mgmt principles (3)	Life - long learning (3)	Professional Skills (3)	Innovative Approach (3)	Research Paper (5)	Total Marks (50)
5	5	4	3	5	2	2	2	2	2	3	3	3	3	1	45

Comments: Dynamic Exit Strategy required.

Date: 10th february, 2024

Name & Signature Reviewer 2 Dr. Nupur Giri

Project review sheet 2

Inhouse/ Industry

Innovation/Resear

Project Evaluation Sheet 2023 - 24

Class: D17 A/B/C

Group No.: 03

Title of Project: INNOVEST

Group Members: OM BORATE (12), DIVESH MANGTANI (34), SUJAL PATIL (44), TARUN SHETTY (53)

Engineering Concepts & Knowledge (5)	Interpretation of Problem & Analysis (5)	Design / Prototype (5)	Interpretation of Data & Dataset (3)	Modern Tool Usage (5)	Societal Benefit, Safety Consideration (2)	Environment Friendly (2)	Ethics (2)	Team work (2)	Presentation Skills (2)	Applied Engg&Mgmt principles (3)	Life - long learning (3)	Professional Skills (3)	Innovative Approach (3)	Research Paper (5)	Total Marks (50)
4	4	4	2	5	2	2	2	2	2	3	3	3	3	4	45

Comments: Integration carried out properly.

Name & Signature Reviewer1 Sanjay M.

Engineering Concepts & Knowledge (5)	Interpretation of Problem & Analysis (5)	Design / Prototype (5)	Interpretation of Data & Dataset (3)	Modern Tool Usage (5)	Societal Benefit, Safety Consideration (2)	Environment Friendly (2)	Ethics (2)	Team work (2)	Presentation Skills (2)	Applied Engg&Mgmt principles (3)	Life - long learning (3)	Professional Skills (3)	Innovative Approach (3)	Research Paper (5)	Total Marks (50)
4	4	4	2	5	2	2	2	2	2	3	3	3	3	4	45

Comments: Research paper refining needed.

Date: 9th March, 2024

Name & Signature Reviewer 2 Dr. Nupur Giri