



Transformative Wealth Management With Blockchain And Machine Learning

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Citation: Rajbharath.R, et al (2024), Transformative Wealth Management With Blockchain And Machine Learning, Educational Administration: Theory and Practice, 30(5), 2095-2104
Doi: 10.53555/kuey.v30i5.3242

ARTICLE INFO

ABSTRACT

This ground-breaking paper presents a cutting-edge web platform intended to meet the financial requirements of three different groups: students, orphans, and venture capital. Through the platform's seamless integration of various sectors, it hopes to change traditional fundraising and investment procedures by utilizing blockchain technology's revolutionary power. First and foremost, the site serves aspiring business owners who frequently find it difficult to obtain the capital needed to realize their ideas. These business owners can use the platform to highlight their initiatives and draw in possible financiers who are looking to fund creative endeavors. Blockchain technology provides financial transactions with immutability and transparency, which gives investors and entrepreneurs trust. Second, the platform offers assistance to orphanages that require critical funding. The website streamlines the flow of funding to support vital services and programs for orphaned children by giving these organizations a platform to engage with donors and benefactors. Because blockchain transactions are transparent, donations are safely recorded and distributed to the intended recipients, promoting accountability and trust in the community. Thirdly, the platform tackles the financial obstacles encountered by students who find it difficult to pay for their education. Students can use the platform to approach donors who are willing to make educational investments for financial help. Smart funding, leveraging blockchain technology, aims to improve fundraising by automating processes through smart contracts and tokenization. Smart contracts execute actions based on predefined criteria, reducing errors and the need for intermediaries. Tokenization allows assets to be represented digitally, enabling fractional ownership and increased liquidity. This approach democratizes access to finance globally. Despite benefits, challenges remain, such as regulatory uncertainty, which is being addressed to create a more secure fundraising ecosystem.

Keywords: Distributed Ledger Technology, Security Token Offering, Initial Exchange Offering, Decentralized Autonomous Organization, Know Your Customer

Introduction:

Blockchain technology utilizes a distributed, decentralized ledger to securely store data and record transactions across a network of computers. Each data block is connected to the previous one, forming an immutable chain that cannot be altered or removed without network consensus. This inherent security makes blockchain ideal for various applications. Its decentralized nature ensures there's no central point of control or exploitable weakness. Additionally, the blockchain is replicated on every node in the network, making it challenging for hackers to manipulate data. Furthermore, once a block is added to the chain, it cannot be

changed, ensuring the accuracy and legitimacy of stored data. The transparency of blockchain allows all participants to monitor and validate transactions, enhancing trust. This technology has found applications in supply chain management, identity verification, and secure data storage.

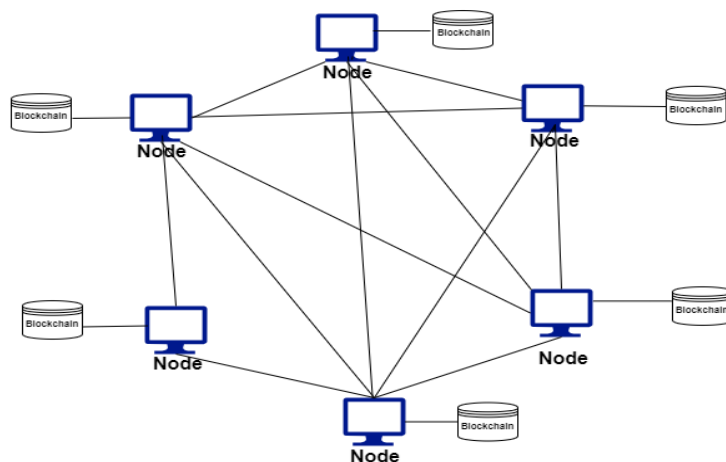


Figure:1 Blockchain network

Blockchain technology lowers the risk of fraud and data breaches in these applications by offering a transparent and safe means of transferring and storing Blockchain technology is being creatively applied to cybersecurity with the proposed method of using it for zero-day detection and prevention. This method offers a more efficient and safe means of identifying and averting zero-day attacks by establishing a cooperative and decentralized network of nodes, through the use of blockchain technology. This method guarantees the integrity and validity of the vulnerability and patch information recorded on the blockchain due to its tamper-proof and unchangeable nature.

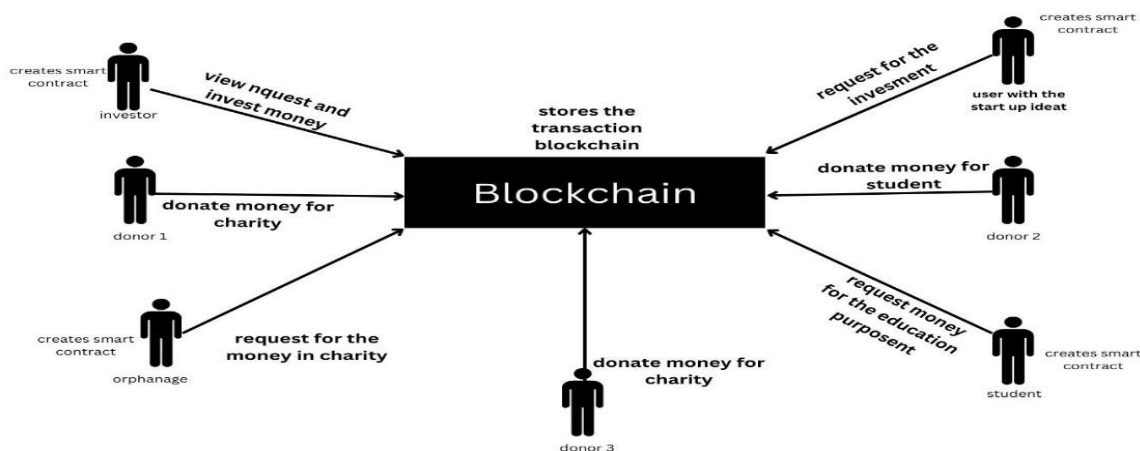


Figure:2 Visual representation of funding platforms

Background And Motivation:

The "Transformative Wealth Management with Blockchain and Machine Learning" project was created to address the shortcomings of conventional wealth management systems. Traditional methods often lack accessibility, and transparency, and are prone to manipulation or error, making them ill-suited for the rapidly evolving financial landscape. The project combines blockchain's transparency, immutability, and decentralization with machine learning's analytical capabilities to revolutionize wealth management. Blockchain technology ensures transparent and secure management of investors' financial data, providing real-time access to assets and activities. Machine learning algorithms analyze vast amounts of financial data to identify patterns and trends, offering customized investment options based on individual risk tolerance and financial goals. This approach enhances decision-making through portfolio optimization and predictive analytics, potentially increasing returns and reducing risks. The project aims to democratize sophisticated wealth management tools, making them accessible to a wider range of investors. By leveraging blockchain and machine intelligence, the initiative seeks to improve trust and confidence in financial markets, fostering openness, efficiency, and inclusivity in wealth management. Ultimately, this effort could contribute to global financial stability and prosperity.

Related Works:

In wealth management, several unique initiatives have investigated the convergence of blockchain technology and machine learning, opening the door for creative solutions and game-changing applications in the industry. The creation of decentralized finance (DeFi) platforms, which use blockchain technology to facilitate peer-to-peer lending, automated asset management, and decentralized exchanges, is one noteworthy example. In comparison to traditional financial intermediaries, these platforms provide users with improved security, lower transaction costs, and more control over their assets.

Decentralized Finance (DeFi) Platforms

Several decentralized finance projects have surfaced, utilizing blockchain technology to transform conventional financial services. Decentralized exchanges for exchanging digital assets, automated asset management via smart contracts, and decentralized lending and borrowing are just a few of the many services provided by DeFi systems. Compound, MakerDAO, and Aave are a few examples of platforms that allow consumers to obtain financial services without the assistance of conventional middlemen, which lowers costs, improves accessibility, and increases transparency in the financial ecosystem.

Machine Learning-Driven Investment Strategies

Advancements in machine learning-oriented investment approaches have produced complex algorithms that can scan through enormous volumes of financial data and spot patterns, trends, and abnormalities in the behavior of the market. Machine learning algorithms are used by hedge funds and quantitative trading organizations for algorithmic trading, high-frequency trading, and risk management. These algorithms produce alpha for investors by constantly adjusting to shifting market conditions and optimizing portfolio allocations.

Blockchain-Based Asset Tokenization

The idea behind asset tokenization is to use digital tokens on a blockchain to represent physical assets like real estate, artwork, and commodities. By allowing investors to buy and sell fractions of high-value assets, this approach fractionalizes ownership, democratizing access to investment possibilities and boosting liquidity in markets that have historically been illiquid. Real estate assets can be tokenized through projects like RealT and Harbor, and digital art and collectibles can be tokenized and traded through sites like OpenSea and Rarible.

Decentralized Identity Management

Blockchain technology is used by decentralized identity management systems to provide users with more control over their digital identities and personal information. By providing safe and dependable identification methods, these systems lower the possibility of fraud, identity theft, and data breaches. Users can establish self-sovereign identities on a blockchain through projects like uPort, Sovrin, and Civic, enabling safe and easy authentication across a range of online platforms and services.

Smart Contract-Based Wealth Management Solutions

The implementation of self-executing contracts, or smart contracts, has made it possible to automate many wealth management procedures like trade executions, dividend payouts, and portfolio rebalancing. Smart contracts are used by wealth management systems developed on blockchain networks, such as Ethereum, to carry out predetermined investment strategies autonomously, lowering operating expenses, doing away with middlemen, and guaranteeing transparent and impenetrable transaction execution.

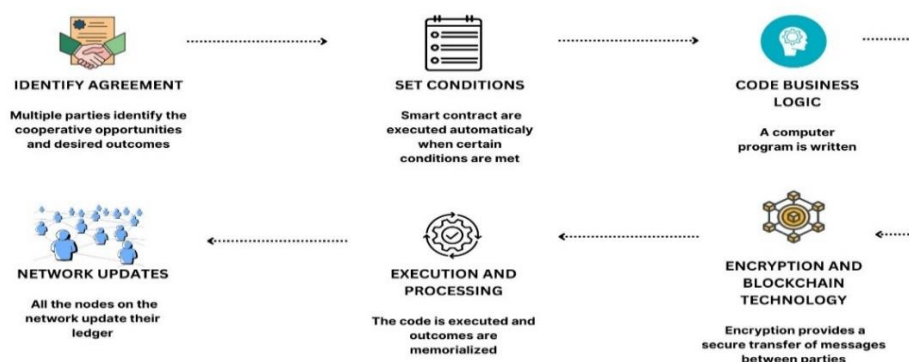


Figure: 3 Working of smart contracts

Regulatory Compliance Solutions

A critical component of wealth management is regulatory compliance, especially in highly regulated markets. Blockchain-based solutions provide visible and unchangeable transaction records, making it easier to comply with legal requirements like know-your-customer (KYC) and anti-money laundering (AML) laws. Financial institutions can monitor and reduce the risks connected with illegal activity utilizing cryptocurrencies thanks to projects like Chainalysis and Elliptic, which offer blockchain analytics and compliance solutions.

Existing work:

Tobias Guggenberger's book, "Kickstarting Blockchain: Designing Blockchain-Based Tokens for Equity Crowdfunding," explores the challenges faced by early-stage businesses using blockchain for equity crowdfunding. It critiques the current financial infrastructure, noting high friction and opacity. Despite ICOs and STOs, challenges persist for blockchain-based equity tokens in fundraising. The book proposes a design science approach to create, build, and evaluate an equity token prototype, aiming to improve crowdfunding models. It establishes seven design principles for blockchain in equity crowdfunding. The research emphasizes advancing equity token design and shows how blockchain can enhance crowdfunding's effectiveness, transparency, and interoperability. It underscores blockchain's potential to transform early-stage firm finance and equity crowdfunding while addressing regulatory constraints and secondary market trading opportunities. Challenges like regulatory clarity, traditional investor acceptance, and security remain.

Proposed system:

Basic tokenization

The suggested system is a groundbreaking startup idea that leverages blockchain technology to create a decentralized network. Its primary goal is to facilitate quick and secure fundraising, bridging the gap between startup entrepreneurs and potential investors. Users register on the site to access an advanced mechanism powered by smart contracts and a robust proof-of-stake algorithm, ensuring tamper-proof records on the blockchain for transparent transactions. This platform extends its functionality beyond traditional startup funding to address urgent financial needs like medical emergencies and school fees, enabling users to establish smart contracts for quick financial support. Tokenization is integrated into the system, enhancing asset representation and liquidity through fractional ownership. The platform emphasizes security, speed, and openness, serving as a decentralized hub for philanthropic financial aid and creative startup funding, aiming to transform conventional fundraising methods into a safe, decentralized environment.

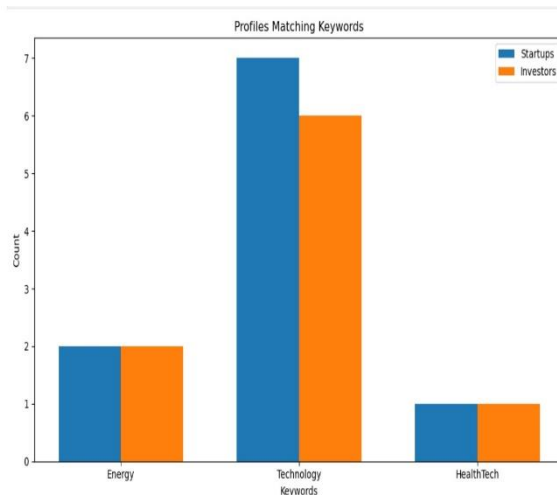


Figure: 4 Profiles matching keywords

Evaluation:

Combining blockchain technology and machine learning offers vast potential for wealth management, but hurdles exist. Blockchain ensures security and transparency but can be challenging to scale, especially with large data sets. Machine learning's computing demands add to scalability issues, requiring careful selection of adaptable platforms and frameworks. Privacy and security are paramount, necessitating strong encryption and privacy methods. Regulatory compliance is complex, with strict guidelines for investor accreditation, KYC, AML, and data security, requiring continuous monitoring and adjustment. User acceptance is critical, requiring intuitive design and incentives for engagement. Effective risk management is vital, considering blockchain's vulnerabilities and machine learning's biases. Success hinges on a platform's ability to navigate these challenges, ensuring compliance, user engagement, and risk mitigation.

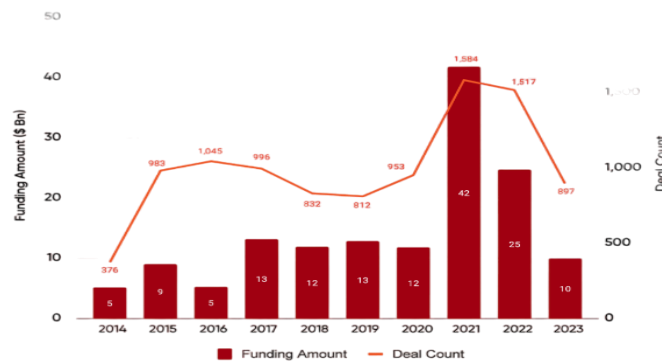


Figure: 5 Impacts new venture creation and startup valuations.

In 2023, startup funding mirrored 2016 levels, with just over \$10 Bn raised, marking a drop to pre-2017 levels. Notably, nearly \$1 Bn of this total came in December alone. Excluding outlier rounds (\$100 Mn and above), the total was \$5.5 Bn, slightly surpassing 2016's entire funding. This decline hints at ripple effects across the ecosystem, impacting new venture creation and startup valuations.

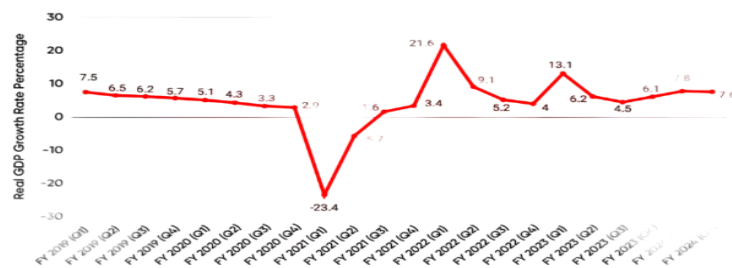


Figure: 6 The average for emerging market economies.

Despite the pandemic-induced shock, India's economy experienced a remarkable V-shaped recovery. After nine quarters of degrowth until Q1 FY21, it rebounded, registering a notable 21.6% growth in the first quarter of FY21, followed by another spike in Q1 FY23. Unlike major global economies facing recessionary signs in 2023, India's economy remained robust, propelled by government stimulus for sectors like manufacturing and a heightened focus on exports. The industrial production index surged, with electronics exports making a significant contribution to this growth. According to the World Bank in October, India was one of the fastest-growing major economies in FY23, with a growth rate of 7.2%, the second highest among G20 countries and nearly double the average for emerging market economies.

Certainly! Here are some general statistics across various domains:

1. Global Population: Approximately 7.9 billion people as of the latest estimates.
2. Global GD: Around \$87.55 trillion USD in 2021.
3. Internet Users: Over 4.9 billion people, representing around 62.5% of the global population.
4. Mobile Phone Users: Over 5.2 billion people, with around 67% of the world's population owning a mobile phone.
5. E-commerce Sales: Over \$4.9 trillion USD in global e-commerce sales in 2021, with online retail sales expected to surpass \$7.4 trillion by 2025.
6. Startups: There are millions of startups worldwide, with around 400,000 new businesses being created each month in the United States alone.
7. Venture Capital Investments: Venture capital investments reached approximately \$682 billion USD globally in 2021.
8. Climate Change: Average global temperatures have risen by about 1.2 degrees Celsius above pre-industrial levels, leading to more frequent and severe weather events.
9. COVID-19: Since its outbreak, there have been over 400 million confirmed cases of COVID-19 worldwide, with over 5.8 million deaths.
10. Renewable Energy: Renewable energy sources accounted for around 29% of global electricity production in 2021, with solar and wind energy experiencing significant growth.

A. Revolutionizing Startup Investment

Investment opportunities are abundant, but trust, transparency, and security are paramount. A platform using blockchain and smart contracts has been developed to revolutionize how investors find, assess, and fund startups. Investors undergo rigorous identification verification to prevent fraud. Blockchain ensures the security and legitimacy of investment data.

Upon verification, investors gain access to a range of investment prospects. The platform's search option uses algorithms and machine learning to match investors with opportunities based on their objectives and risk tolerance. Solidity smart contracts are used for tokenization, streamlining the investment process. These contracts, written for the Ethereum blockchain, manage the investment lifecycle, ensuring transparency and efficiency. Smart contracts also enforce predetermined milestones, incentivizing idea owners and entrepreneurs to fulfill commitments. The platform provides extensive insights for well-informed decisions, with basic information available to all users and more in-depth analysis for a small fee.

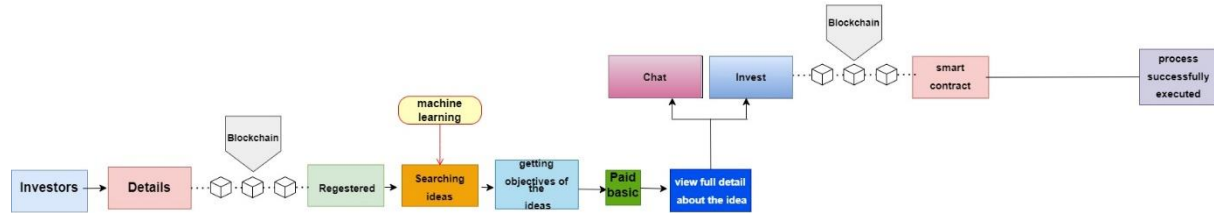


Figure: 7 Revolutionizing startup investment

B. Empowering Transparent Giving

A new platform has been developed to facilitate safe and transparent donations for charitable causes, leveraging blockchain technology and smart contracts. The platform caters to donors interested in supporting initiatives like educating impoverished students or aiding orphanages. Donors begin by providing personal data and undergoing identification verification to ensure the legitimacy of contributions. Once verified, donor data is securely stored on the blockchain. Donors receive a confirmation email upon successful registration. Donors can choose to fund education for disadvantaged children or donate to an orphanage, aligning with their values. They can explore other donation opportunities using the platform's search tool. After selecting a cause, donors can communicate directly with the recipient or organization via a chat interface to learn more about how their donations will be used and build a relationship. The donation process is initiated through a smart contract, ensuring that the donation is handled securely and transparently based on agreed-upon terms. The entire transaction is recorded on the blockchain, providing donors with a visible and auditable trail.

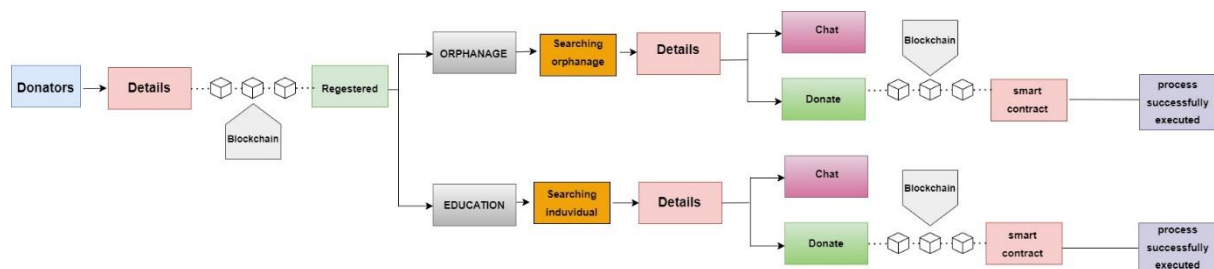


Figure: 8 Empowering transparent giving

C. Fostering Educational Equality

To ensure contribution legitimacy, donors must authenticate their identification before starting the education donation procedure on the platform. After registration, donors can support impoverished students' education. They are directed to the education section, where they can explore ways to help underprivileged pupils, such as finding schools, initiatives, or specific students in need using the search feature. Donors can connect directly through a chat interface with recipients or organizations they wish to support, gaining insight into how their contributions will impact students' lives. The donation process is initiated through a smart contract, ensuring a safe and transparent transfer of funds based on agreed-upon terms. Once executed, the smart contract completes the donation process, recording the transaction on the blockchain for visibility and auditability. In conclusion, the platform provides a safe and straightforward way for donors to support the education of disadvantaged children. Using blockchain and smart contracts, donors can confidently make a positive impact on children's lives.

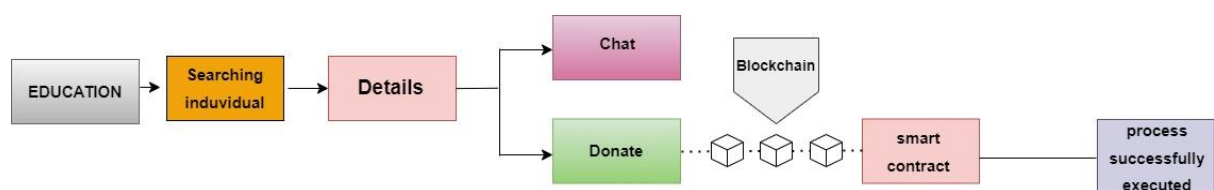


Figure: 9 Fostering educational equality

D. Orphanage Donation Platform

The platform allows donors to donate to orphanages through a secure and transparent process. They enter their details and verify their identity, then choose to donate to an orphanage. They can explore various opportunities, engage in direct communication, and initiate a smart contract to transfer funds to the orphanage. The transaction is recorded on the blockchain, providing a transparent record of the donation. This platform ensures a secure and transparent way for donors to make a meaningful impact on orphaned children's lives.

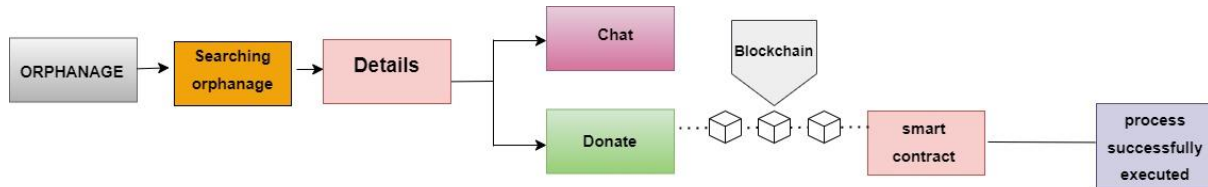


Figure: 10 Orphanage donation platform

Implementation: Contract creation

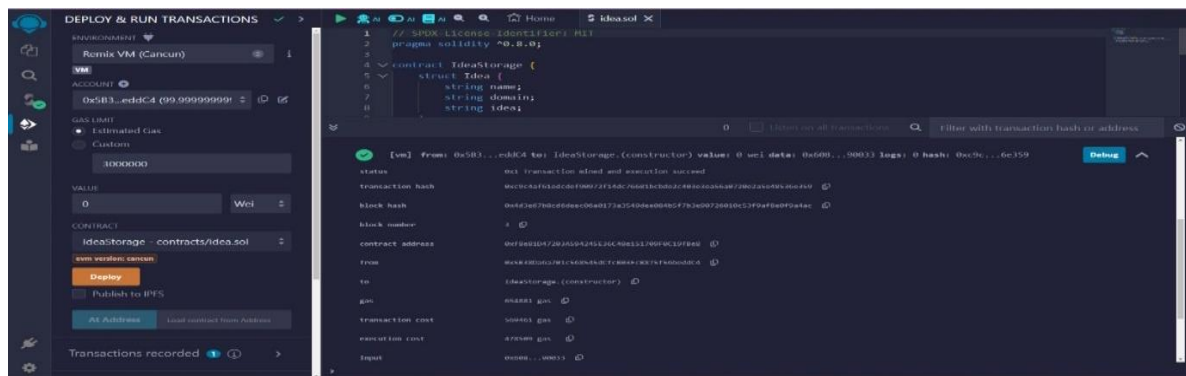


Figure: 11 Contract creation

Startup contract creation using solidity to save and retrieve saved data and the contract successfully deployed.

Saving startup ideas in the contract

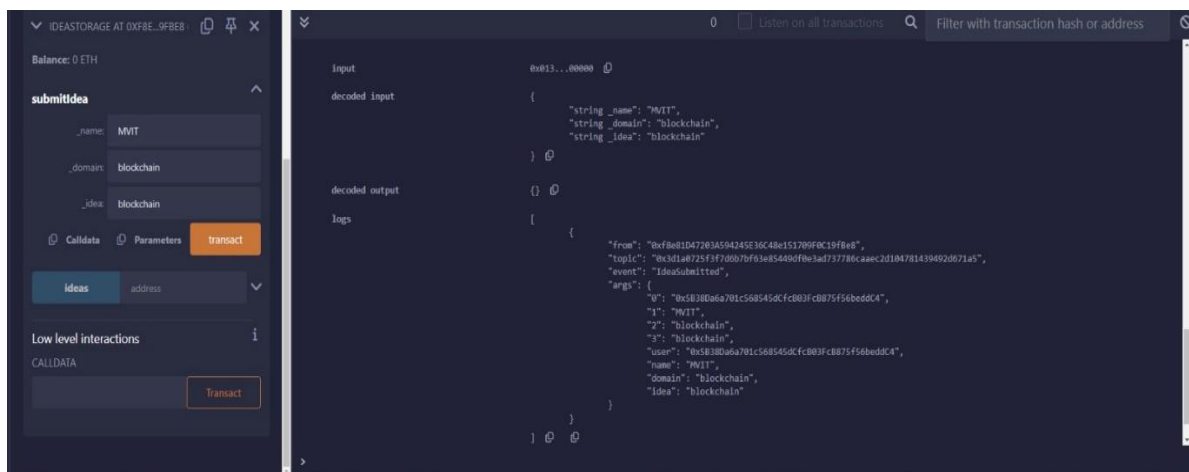


Figure: 12 Saving startup ideas in the contract

Working on the startup, here we are saving startup ideas in the contract.

Algorithm implementation for search in startup

```
# Function to search for profiles based on keywords
def search_profiles(keyword):
    print(f"Searching for profiles matching keyword: {keyword}\n")

    # Search startup profiles
    print("Startup Profiles:")
    for startup in startup_profiles:
        if keyword.lower() in startup['description'].lower():
            print(f"- {startup['name']}")

    print()

    # Search investor profiles
    print("Investor Profiles:")
    for investor in investor_profiles:
        if keyword.lower() in investor['interests'].lower():
            print(f"- {investor['name']}")

# Search for profiles based on specific keywords
search_profiles("HealthTech")
```

Searching for profiles matching keyword: HealthTech

Startup Profiles:
- HealthTech Revolution

Investor Profiles:
- Healthcare Ventures

Figure: 13 Algorithm implementation for search in startup

Retrieved from the ganache

Ganache				
ACCOUNTS	BLOCKS	TRANSACTIONS	CONTRACTS	EVENTS
CURRENT BLOCK 7	GAS PRICE 20000000000	GAS LIMIT 0721975	HARDFORK MuirGLACIER	NETWORK ID 5777
			RPC SERVER HTTP://127.0.0.1:8545	MINING STATUS AUTOMINING
				WORKSPACE SRI
				SWITCH
TX HASH 0x9d65cbc47f7febf20b99fc4c90c1833e11e7eadff7c4b68d6549cbbcdf6e8d2a				CONTRACT CREATION
FROM ADDRESS 0xA500e0CEC9b6Fa52594cb993531c556733A8cb3b		CREATED CONTRACT ADDRESS 0x26ef4DF3a929F5Ead1839B897e8b8a9B288097	GAS USED 665488	VALUE 0
TX HASH 0x3d4eb7cfff0b396329d78c71da0eda0e7796adc978349c13be84363dcd491943				CONTRACT CALL
FROM ADDRESS 0xA500e0CEC9b6Fa52594cb993531c556733A8cb3b		TO CONTRACT ADDRESS 0x32E462FF564c489630C85188D87087D7513e947d	GAS USED 117301	VALUE 0
TX HASH 0xb15ca40765e7667cf6698f0e31e9fe0c621ea1a796e9c7992b039f7cb905b3a7				CONTRACT CREATION
FROM ADDRESS 0xA500e0CEC9b6Fa52594cb993531c556733A8cb3b		CREATED CONTRACT ADDRESS 0x32E462FF564c489630C85188D87087D7513e947d	GAS USED 706098	VALUE 0
TX HASH 0x15b14cb3ff814c8702dfbcea2841be5820cd53088c2cbd612c0b49dd15d8e853				CONTRACT CALL
FROM ADDRESS 0xA500e0CEC9b6Fa52594cb993531c556733A8cb3b		TO CONTRACT ADDRESS 0x685661D92a21931DAf47c7f10e1dFa300aE14b3	GAS USED 117349	VALUE 0
TX HASH 0xe8ef1d9988cc9bc1f3c02937e5d1487bbe067e8030cd30cd1223af47538f46d0				CONTRACT CREATION
FROM ADDRESS 0xA500e0CEC9b6Fa52594cb993531c556733A8cb3b		CREATED CONTRACT ADDRESS 0x32E462FF564c489630C85188D87087D7513e947d	GAS USED 706098	VALUE 0

Figure: 14 Retrieved from the Ganache

The contract creation and retrieved from the ganache

Connecting with Wallet

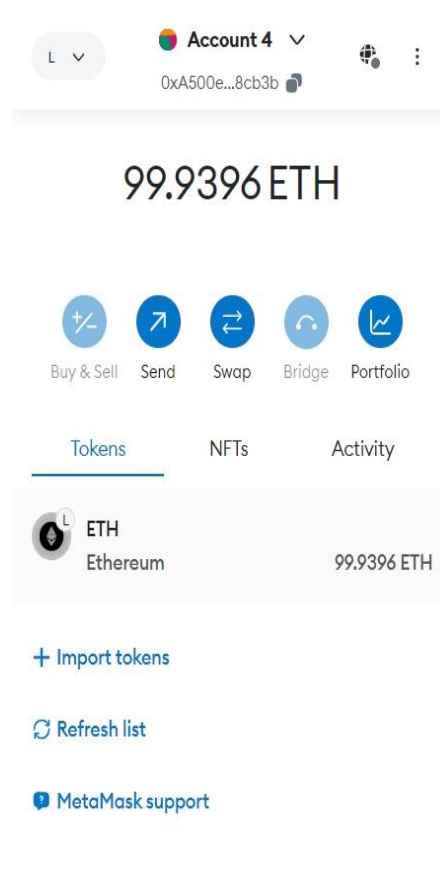


Figure: 15 Connecting with Wallet

The ganache is locally connecting with Wallet which is named a meta mask and from the wallet, it will connect to the react website which helps deploy the contract while deploying the gas fee will be generated using this wallet.

Interface of the website

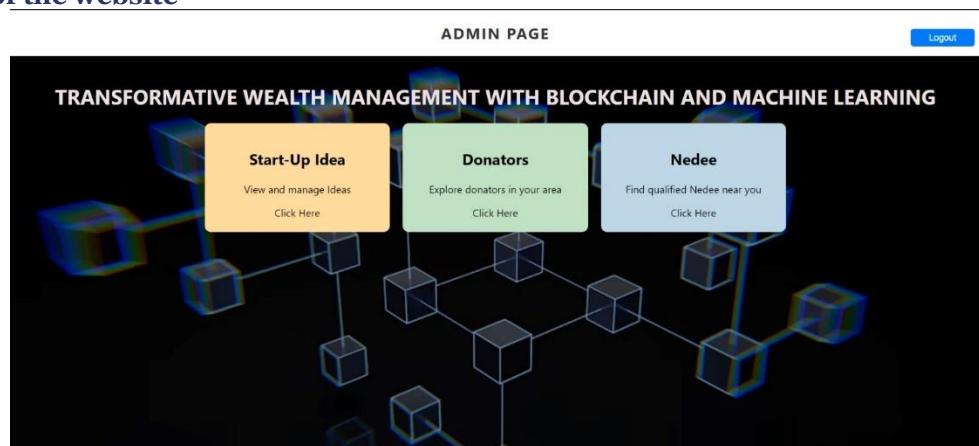


Figure: 16 Interface of the website

The interface of the website is user friendly, the user can use it and save their data in the blockchain

Conclusion:

The proposed smart financing platform is a game-changer in fundraising, leveraging blockchain for decentralization, automation, and transparency. Using smart contracts, it lowers costs, enhances investor access, and ensures transaction security. Fractional ownership makes valuable assets more accessible, aligning with blockchain's principles of inclusivity and fair investment. Regulatory compliance, including KYC and AML processes, enhances trust and transparency. The platform's user-friendly design promotes

accessibility, enabling a wide range of participants. Overall, it promises a future of more open, inclusive, and efficient fundraising through technical innovation, regulatory diligence, and user-centric design.

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