



Crowd funding Using Ethereum

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Abstract: In the digital age, traditional crowdfunding platforms have facilitated the connection between creators and backers, revolutionizing fundraising for various projects. However, inherent limitations such as centralized control, lack of transparency, and high transaction fees persist within these platforms. This abstract introduces a novel solution leveraging Web3 technology to address these shortcomings. The proposed Web3 crowd funding platform employs block chain, smart contracts, and decentralized finance (DeFi) principles to create a transparent, secure, and inclusive ecosystem. By utilizing block chain technology, all transactions and interactions are recorded immutably, ensuring transparency and accountability. Smart contracts automate processes, eliminating the need for intermediaries' and reducing associated costs. Additionally, the integration of decentralized finance enables seamless, peer-to-peer transactions, bypassing traditional banking systems and lowering financial barriers for both creators and backers. Key features of the platform include decentralized governance, enabling community-driven decision-making processes, and tokenization of assets, allowing backers to gain fractional ownership or access to project-specific utilities. Moreover, the platform fosters a vibrant ecosystem by incentivizing participation through token rewards and staking mechanisms. Through the adoption of Web3 principles, this crowd funding platform aims to democratize fundraising, empower creators, and engage a global community of backers. By decentralizing control and leveraging block chain technology, it heralds a new era of transparent, efficient, and equitable crowd funding.

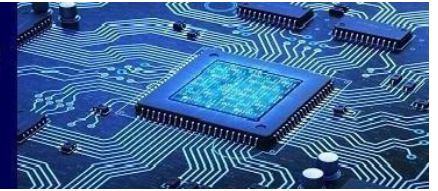
Keywords: Crowdfunding, Blockchain, Web3, Decentralization, Smart Contracts, Ethereum, Testnet, sepolia

1. INTRODUCTION:

Crowdfunding has become a used approach to gather funds, for projects, causes and businesses by gathering small donations from a large group of people. The introduction of technology has transformed this fundraising method providing security, transparency and efficiency for both fundraisers and investors. Through the use of technology crowdfunding platforms can now facilitate transactions without the need for trust, utilize smart contracts and implement decentralized funding systems to streamline and broaden participation in the process.

Cryptocurrencies and blockchain technology are connected yet separate ideas. Blockchain technology serves as the foundation for cryptocurrencies acting as ledger that authenticates and documents transactions, across multiple computers. In contrast cryptocurrencies function as currencies that employ encryption methods to ensure secure transactions and manage the generation of new units.

Blockchain technology provides the foundation for cryptocurrencies by ensuring the transparency, security, and immutability of transactions. It eliminates the need for intermediaries such as banks, as the transactions are directly recorded and verified on the blockchain network [1]. This decentralized nature of blockchain technology enhances the trust and security of cryptocurrencies, as it is difficult to alter or manipulate the transaction history.



Digital currencies, like cryptocurrencies utilize technology to facilitate transactions while prioritizing privacy and security. They allow transactions between individuals without relying on payment methods providing advantages such, as reduced fees, quicker transaction processing and worldwide availability. Cryptocurrencies have become increasingly popular for their potential to promote inclusivity and serve as a means of storing values or conducting transactions.

2. MATERIALS AND METHODS:

Our paper, "**Crowdfunding Using Ethereum**" mainly focuses on the user friendliness it provides to participants. Conventional crowdfunding platforms tend to involve steps for validating transactions, handling finances and allocating rewards. In a light blockchain driven crowdfunding simplifies these processes enabling individuals to donate track progress and access funds, in a straightforward setting. This simplicity not draws in an audience of potential supporters but also promotes continued engagement thereby nurturing a livelier and more engaging crowdfunding community.

The Ethereum blockchain was chosen for this investigation because of its adaptability to a range of use scenarios. For our investigation, we used the concept of smart contracts. Solidity is a popular programming language used to create Ethereum-based smart contracts. A smart contract seeks to eliminate the need for an intermediary by facilitating trade and business between identifiable and anonymous participants. Smart contracts are essentially accounts that are controlled by code instead of human beings. Contract accounts have features like balances that track how much ether is in them. It also has two more fields: storage, which includes the data, and code, which contains the actual machine code for the contract.

The computer language Solidity is used to write smart contracts. Upon building the code in the solidity compiler, the byte code that will be posted to the Ethereum network is contained in the first of two files that the Solidity compiler creates. An Application Binary Interface is an additional crucial file that can communicate with the contracts that have been deployed. In essence, application binary interface helps us create a web application using Ethereum smart contracts. Testing is a crucial stage that comes just after a contract is deployed. Because there will be a number of transactions occurring, testing is necessary. Testing is done to make sure the contract is operating as intended. On a local test network that is operating on a local device, we implement these smart contracts. Next, a local test network is set up for the smart contracts' deployment and testing.

3. ARCHITECTURE:

The architecture of the crowdfunding application begins with a front-end web or mobile application, where users can create campaigns to raise funds for a cause or project. The front-end part of the application is responsible for user authentication and campaign management.

When a user wants to create a new campaign, they would need to provide details such as the name of the project, a description of what the funds will be used for, and the amount of money they want to raise. Once the user creates the campaign, the web or mobile application would generate a unique identifier for the campaign. This identifier would be used as a reference to the campaign data stored on the blockchain.

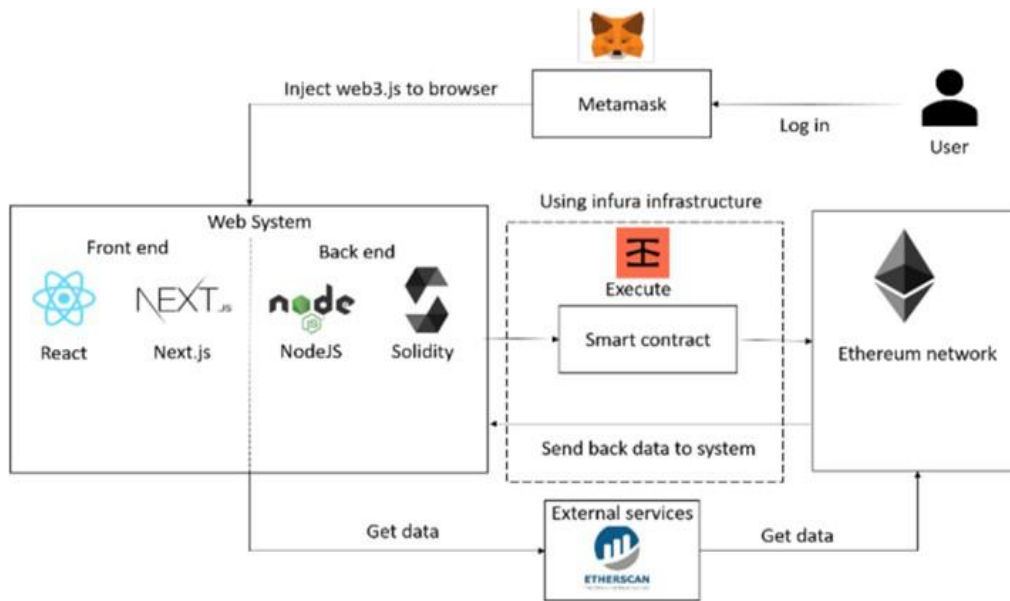
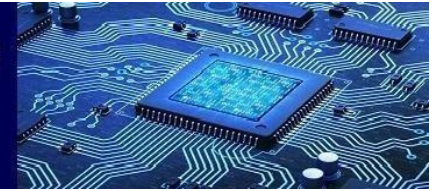


Fig. 1. Architecture diagram for crowdfunding using ethereum

4. FLOWCHART:

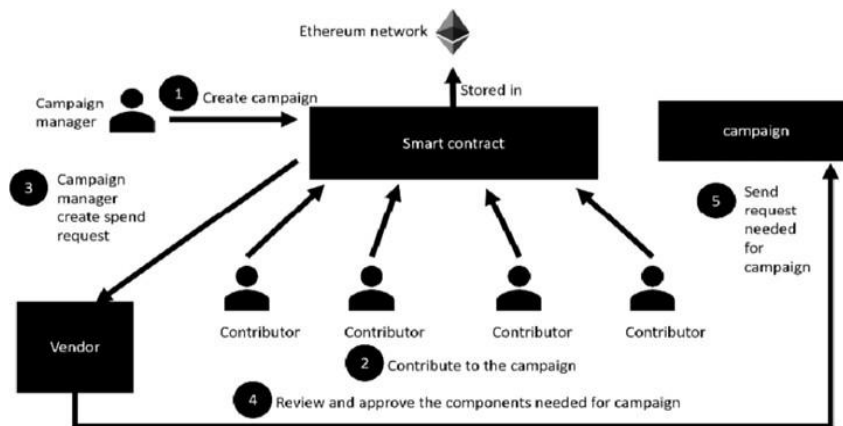
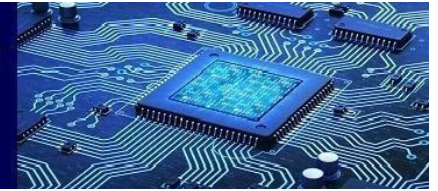


Figure 2: Flow of Ether in blockchain model

Fig. 2. Flowchart diagram for crowdfunding using ethereum

- 1) Firstly ,Users create accounts and manage campaigns via a web or mobile application, providing project details like name, description, and funding goal.
- 2) Then a unique identifier for each campaign is generated, referencing the campaign data stored on the blockchain.
- 3) After that the campaign details are stored in a smart contract, including project information,



- funding goal, and deadline.
- 4) Then, the smart contract is deployed to the Ethereum Sepolia testnet, creating a unique contract address on the blockchain.
 - 5) Supporters contribute via Ether or custom tokens, sending funds directly to the smart contract address.
 - 6) Smart contracts track contributions, validate deadlines, and log donor data and contribution amounts on the blockchain for transparency.
 - 7) Upon the campaign's completion, funds are transferred to the owner's wallet if the goal is met otherwise, contributions are refunded.
 - 8) Supporters browse and contribute through the front-end application, receiving confirmation and details recorded on the blockchain.
 - 9) Campaign owners monitor progress, update details, and communicate with supporters via the front-end application.

5. PICTORIAL REPRESENTATION:

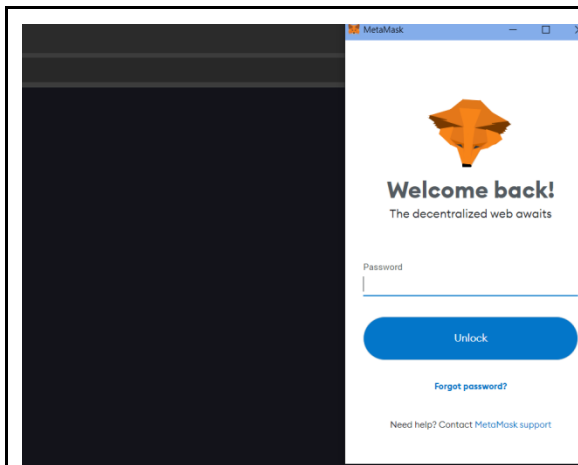


Fig. 3. Metamask wallet login page

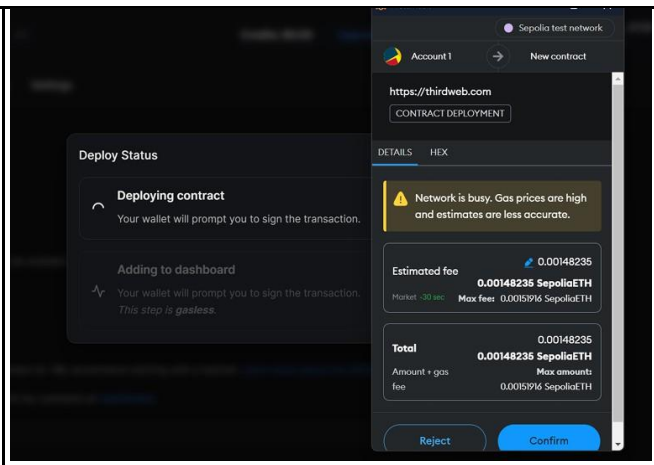


Fig. 4. Contract Deployment

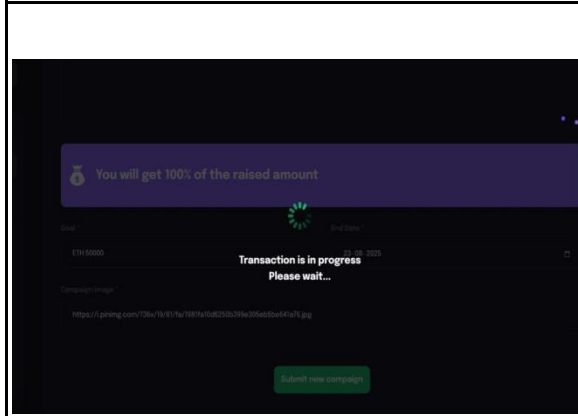


Fig. 5. New campaign hosting

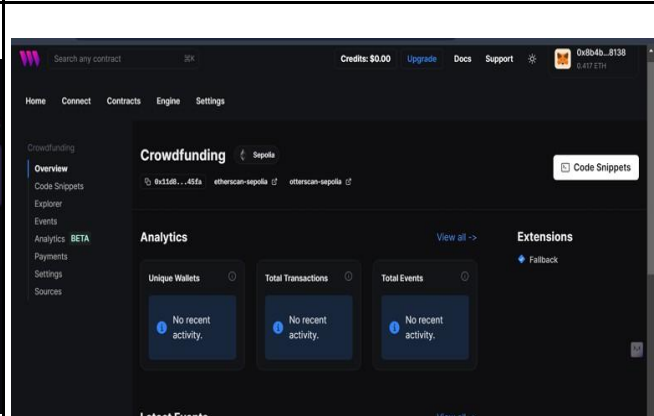


Fig.6. Deployed contracts analytics data



APPLICATIONS OF CROWDFUNDING:

Tokenized System:

While crowdfunding necessitates facilitating the creation of physical goods, blockchain typically depends on asset tokenization to offer investors equity or notional into initial coin offerings, or ICOs. Investors would be able to observe the success, which is actually proportionate to the company's following prosperity. This essentially indicates that it is capable of taking advantage of the different investment opportunities available worldwide. Since funding is a crucial component for new businesses, this might benefit them by reducing the cost of hiring staff and allowing them to receive remuneration commensurate with their ownership stake in the company, turning it into an employee-owned corporation.

In this instance, asset tokens function as independent money, enabling the organizations to hire more professionals.

Extensive Availability:

Any business that uses crowdfunding and blockchain technologies would undoubtedly receive investment. Furthermore, everyone with an internet connection will be able to participate in these kinds of projects. Because investors in crowdfunding using blockchain technology will obtain their ownership or a portion of the business immediately, it is advantageous to them in that "fraud" won't occur in these situations.

Decentralized:

One benefit of this approach is that startups won't need to use any platform's services to raise capital. They are no longer subject to any guidelines or policies set forth by other platforms. Therefore, any initiative that can garner attention has the potential to receive funding and, as a result, can forgo the need to pay platform fees. As a result, crowd fundraising is now inexpensive and accessible to contributors and investors.

Smart Contracts:

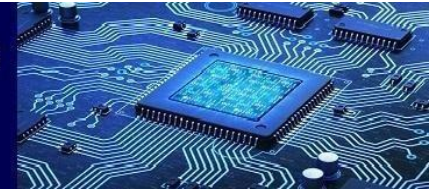
Smart contracts made possible by blockchain technology can increase crowd funding accountability in a number of ways. Above all, the smart contracts would erect barriers that would prevent the money from being delivered for any project or other legal campaign without a deduction.

Consequently, this would stop enormous quantities of money from being embezzled by people who aren't qualified to lead the campaign in the first place or who have bad intentions. It is self-executing, and if all the requirements are satisfied, it automatically transfers the funds for additional development.

Open Source and Community Development:

DAO (Decentralized Autonomous Organization) Funding, communities have the ability to pool funds to jointly administer and fund open source initiatives or decentralized apps (dApps).

Portals are basic arbitrator between organizations and suppliers. The plural is essential in that



which highlights the convenience of data integration. Bots can be used to link all your portals, employees with direct access to the collected data.

ssary information but also distribute them as they reach everyone. It definitely eases the struggle of compliance.

SAMPLE OUTPUT:

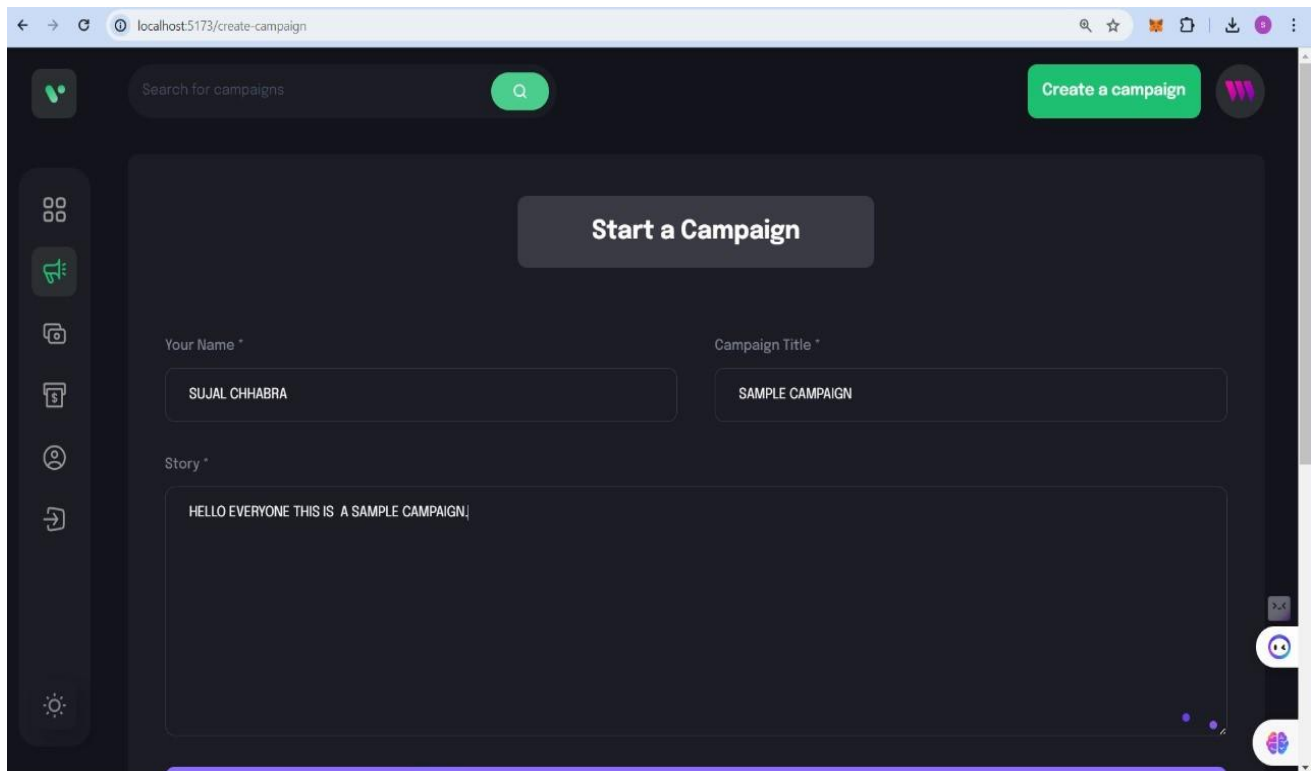


Fig.7.Sample output of creating a campaign

6. CONCLUSION:

The use of blockchain technology in Web3 crowdfunding is revolutionizing the way that projects are funded and supported. Through the use of decentralized platforms, it does away with conventional middlemen, lowers expenses, and improves participant confidence and transparency. The unchangeable record of blockchain technology guarantees financial responsibility and traceability, promoting a fairer and more comprehensive financial system. In addition, the incorporation of smart contracts streamlines funding procedures, guaranteeing that funds are disbursed solely upon the fulfillment of predetermined criteria. This innovation offers a safe, effective, and transparent way to fund initiatives, which empowers both creators and backers while also democratizing access to capital. The future of crowdfunding is bright, with Web3 and blockchain use expected to continue growing. This will present new options and promote a more decentralized and community-driven economy.

7. REFERENCES:

- [1] G.Eason,B.Noble,andI.N.Sneddon,“OncertainintegralsofLipschitz-HankeltypeinvolvingproductsofBessel functions,” Phil. Trans. Roy. Soc. London, vol. A247, pp. 529–551, April 1955. (references)
- [2] J.ClerkMaxwell,A TreatiseonElectricityandMagnetism,3rded.,vol.2.Oxford:Clarendon,1892,pp.68–73.



- [3] I.S.JacobsandC.P.Bean,“Fineparticles,thinfilmsandexchangeanisotropy,”inMagnetism,vol.III,G.T.RadoandH.Suhl,Eds.NewYork:Academic,1963,pp.271–350.
- [4] K.Elissa,“Titleofpaperifknown,”unpublished.
- [5] R.Nicole,“Titleofpaperwithonlyfirstwordcapitalized,”J.NameStand.Abbrev.,inpress.
- [6] Y.Yorozu,M.Hirano,K.Oka,andY.Tagawa,“Electronspectroscopystudiesonmagneto-opticalmediaandplastic substrateinterface,”IEEETransl.J.Magn.Japan,vol.2,pp.740–741,August1987[Digests9thAnnualConf.Magnetics Japan, p. 301, 1982].
- [7] M.Young,TheTechnicalWriter’sHandbook.MillValley,CA:UniversityScience,1989.
- [8] S.W.A.Rizvi,andR.A.Khan,“MaintainabilityEstimationModelforObject-OrientedSoftwareinDesignPhase (MEMOOD),” Journal of Computing, vol.2, no.4, pp.26-32, 2010.
- [9] H.B.Yadav&D.K.Yadav,“EarlySoftwareReliabilityAnalysisusingReliabilityRelevantSoftwareMetrics,” InternationalJournalofSystemAssuranceEngineeringandManagement,pp.1-12,2014
- [10] S.Aljahdali,“DevelopmentofSoftwareReliabilityGrowthModelsforIndustrialApplicationsUsingFuzzyLogic,” Journal of Computer Science, vol.7, no.10, pp.1574-1580, 2011.
- [11] C.WholinandP.Runeson,“DefectContentEstimationsfromReviewData,”In:Proceedingsof20thInternational Conference on Software Engineering, pp.400-409, 1998.
- [12] M.R.Lyu,“HandbookofSoftwareReliabilityEngineering,”IEEEComputerSocietyPressLosAlamitos,California, pp.1-819, 1996.
- [13] Ramosetal,S.(2014).“CrowdfundingandtheRoleofManagersinEnsuringtheSustainabilityofCrowdfunding Platforms (Rep.)”, Publications Office of the European Union. doi:10.2791/76003.
- [14] T.Branzov&N.Maneva,“CrowdfundingBusinessModelsandTheirUseinSoftwareProductDevelopment,”2015.
- [15] Gebertetal.,“ApplicationOfBlockchainTechnologyInCrowdfunding”,2017,NewEuropean.
- [16] A.Angrishetal.,“ACaseStudyforBlockchaininManufacturing:“FabRec”:APrototypeforPeer-to-PeerNetwork of Manufacturing Nodes”, Procedia Manufacturing, vol. 26, pp. 1180-1192, 2018.
- [17] Tsankov,P.,Dan,A.M.,Cohen,D.D.,Gervais,A.,Buenzli,F.,&Vechev,M.T.(2018).Securify:PracticalSecurity Analysis of Smart Contracts. CoRR, abs/1806.01143.