Crowdfunding using Blockchain for Startup Ventures

S.S. Sambare

Kalyani Khandait

Kshitij Kolage

Tanvi Nimbalkar

Keyur Kolambe

ABSTRACT

Crowdfunding is an open method of raising finances. It allows fundraisers to raise significant sums of money from a crowd using an internet platform. Crowdfunding may be classified into several forms based on the motives and benefits, such as charity, equity, and startup businesses. Blockchain is a new technology that has emerged in recent years. It has several qualities, like decentralization, transparency, and security, that make it easy to use and trustworthy. The fundamental benefit of employing this technology in crowdfunding is decentralization, which eliminates the need for consumers to rely on a platform or a centralized entity.Typically, when dealing with large sums of money, users are concerned about the security of the same; in this case, blockchain provides a greater advantage for security purposes. This also adds transparency to the platform, increasing the trust of investors who invest through it. There are some challenges in the current crowdfunding system related to illegal transactions and misuse of funds that can be eliminated by using Blockchain. Because all the transaction records in a public distributed ledger, each system participant can track every transaction while maintaining the crowdfunding platform's transparency. In this paper a solution has been proposed to use blockchain technology in crowdfunding for startup ventures in this paper. The system will address some of the shortcomings of existing crowdfunding platforms by introducing T220 tokens, which will allow users to use Indian rupees instead of ethers as currency.

Keywords

Blockchain, crowdfunding, smart contract, solidity

1. INTRODUCTION

Increasing resources for a specific project through crowdsourcing as opposed to using pre-established resources like banks or credit providers can be described as crowdfunding. The crowdfunding activity predominantly elaborates mainly the following parties, which are as specified patrons.[1] the crowdfunding platform and its managers. The principal advantage of crowdfunding is that it can collect how much cash is required in a short interval of time. This is due to the fact that many people today use the Internet and online entertainment, which implies that the project holder can connect people through these platforms in general inside a short measure of time.[2] Some well known crowdfunding platforms available globally are kickstarter, Indiegogo and mystartr. These platforms accommodate various forms of crowdsourcing, including reward- and charity-based initiatives.

Fundraising based on donations: In this sort of crowdfunding there is no monetary re-visitation of benefactors and financial backers [13]. This type of crowdfunding is mostly done for the social cause. This incorporates good causes, NGOs, calamity reliefs and clinical help. Ketto and Bitgiving are famous crowdfunding platforms in India.

Rewards-Based Crowdfunding: This type of crowdfunding is based on a reward system as the name suggests. When the participants contribute to the project, they receive a reward in terms of profit sharing or getting a discount on the product or even getting it for free.Wishberry and Impact Guru are leading platforms in India under this category. Equity Based Crowdfunding: This is one type of crowdfunding in which the investors are given the shares of the company they are contributing to. The number of shares and amount to be contributed is decided by the project holder itself. So by doing this, the contributors get the portion of profit that is earned by the project after its implementation.

Notwithstanding, in spite of enjoying many benefits, crowdfunding stages actually numerous blemishes that must be addressed. One of the them is pressing concerns that is being followed in the traditional crowdfunding stage is deceive cases [3], expressed that internet crowdfunding leaves patrons helpless to misrepresentation in light of the fact that conventional legitimate and reputation safety efforts may not work.By carrying out smart contracts in a crowdfunding framework, make an agreement that holds the patron's cash till some random date or goal is achieved.
Via completing smart agreements in a crowdfunding system, we can settle on an understanding that will keep a supporter's money until some arbitrary date or goal is met. As a result, the assets will be purchased by the owner or securely go back to the contributors.[2] Blockchain is characterized as a dispersed data set of records of all transactions that have been executed and distributed among the parties.[4]

The sections included in the paper are as follows: Section II discusses the use of blockchain in solving current issues.Section III includes blockchain applications for the crowdfunding platforms Section IV includes a comparison of the available research papers.Section V describes the generalized crowdfunding process, and Section VI concludes.

2. HOW BLOCKCHAIN SOLVES EXISTING PROBLEMS?

Modern crowdfunding systems are highly centralized. Each investment made during the specific campaign is transferred to the owner's account. None of the investors are aware of the transactions that the owner has made.The sole foundation of any investment made in such a campaign is trust. The investors lack any recognition of the money they contributed or any documentation of all the efforts taken by the owner to accomplish the objective.This raises the possibility of fraudulent conduct on the part of the owner. The money raised might not be used for the intended purpose.Using blockchain all the transactions done by the owner of the campaign are

transparent to all the participants of the campaign. This solves the main concern of current platform of not providing the transparency.The fact that the existing crowdfunding systems rely on other platforms to handle funds might cause delays, high transaction costs, and security issues. Blockchain-based payment systems can make transactions safe, quick, and affordable while doing away with the need for middlemen.

For the enrollment and confirmation of investors in crowdfunded organisations, paper records of investor information serve as a consolidated data medium. These centralised solutions do not address the problem of information security since the hazards of information misuse and information manipulation still remain.A system built on blockchain technology allows the investment records to be used as a better alternative to traditional paper reports. [6]

3. EXISTING ARCHITECTURE MODELS:

A] The creators from Malaysia [2] proposed a crowdfunding framework involving ReactJs and NodeJS technologies. For contracts advancement, Solidity language was utilized. They used infura framework rather than a district node, here it acts as a remote node from the network as shown in figure 1.To Start utilizing the framework,we need to use a crypto-currency wallet known as Metamask. It helps users with the interactions of dApps. It's an extension to the browser. Metamask infused Web3 case on an internet browser; the user will interact with the framework, if the user has Ether in his record; for the same project he has to transfer some Ether to his account.

Then, the campaign can begin making an effort and different clients can add to the mission. Separated from that, supervisors likewise can make solicitations to show how the cash gathered will be utilized. The givers conclude regardless of whether the costs are appropriated, and in the event that it is endorsed by a larger part of the sponsor, then, at that point, just the Ether will be shipped off to the vendors. As mentioned before it's secured with a network with Infura infrastructure. Here the authors used a testnet instead of the main network. They utilize a proof-of-authority blockchain platform called Rinkeby organization to invigorate exchanges executed by clients. By utilizing Rinkeby platform, Ether which is a cryptocurrency for Ethereum can't be mined, all things considered, demand RinkebyTest. The overall discussion is shown in the figure 1 below.
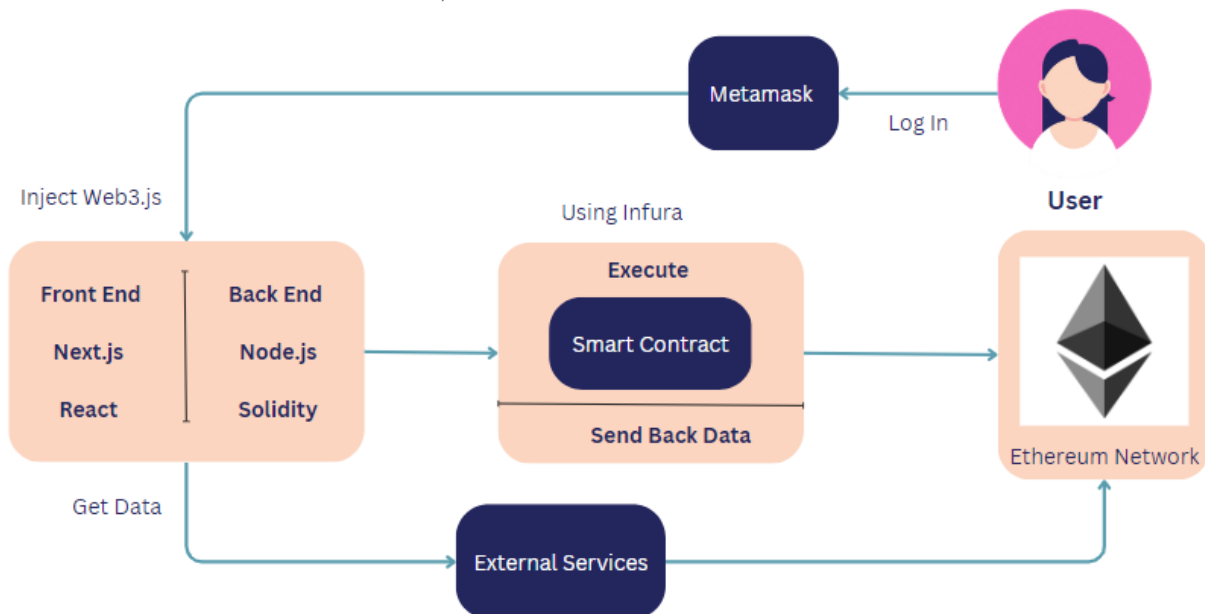

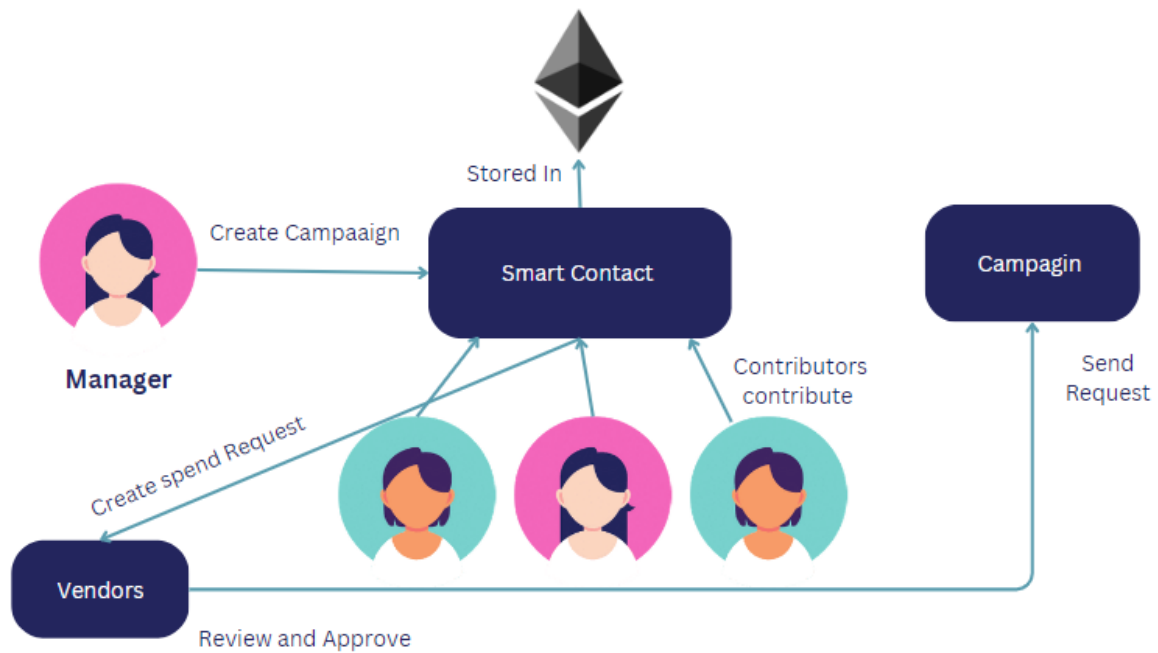**Figure 1. Common Methodology used by existing systems.**

Figure 2. Flow of ether

Figure 2 explains the flow of ether.[2] To start, the campaign manager has to generate and fill campaign specifications. To assure benefactors, he likewise may transfer plans in PDF design.Proposition will be placed in InterPlanetary File System (IPFS), distributed document sharing framework. then in the next step, The campaign then will show up in its page. If in the event the supporters are intrigued with the mission, they might donate in the campaign.Now, the manager makes cost demands, which consists of rundown things expected to run the campaign. In this step Patrons gets notices of new cost demand has been added.Next, the Supporters audit either the modules proposed by the manager is suitable or not, on the off chance that it is proper, then, at that point, patrons can cast a ballot to agree with the modules recorded.Assuming larger part of patrons agree, smart contract will send gathered assets to the individual sellers.At last, the particular seller then sends the module consented to the manager.

B] The system proposed by [5] is based on Ethereum Blockchain which connects the two terms, Cryptocurrency and Crowdfunding in an efficient way. From the ongoing structure, it is seen that the gathering of data is being done to rise the resources by forming an association of experienced people who have the right skills and required task considerations that would help society. We want a safer and straightforward framework in light of the fact that the current framework has concerns like security, impedance of an outsider, and so on.In this proposed system, the money is added to the pool of transactions related to a particular project with the help of a smart contract. When all conditions are met then the money is given to the respective project holder after the approval of bakers. There should be an approval of more than 50% of Bakers to be able to execute the contribution of that entity to the project.
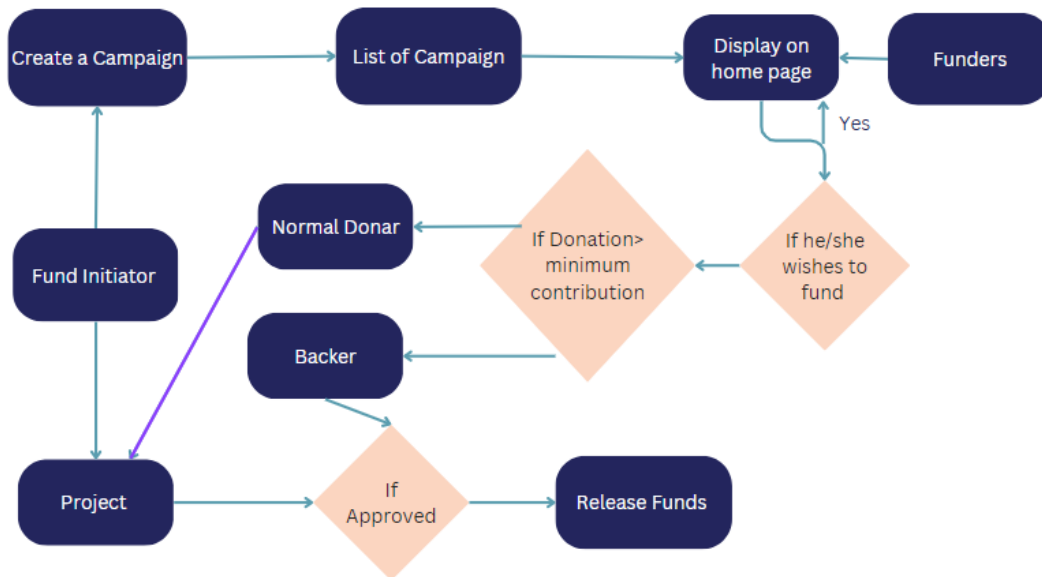
Figure 3.Common Flow Diagram

These are the steps implemented in the existing architecture:
a) The participant will create a project and upload it on the platform.
b) Once everyone has uploaded the projects,they will be displayed on the platform.
c) Then the funders will find the project they want to fund from the available projects.
d) The minimum amount for contribution is decided by the project holder and depending upon the amount, the contributor is decided either a backer or normal donor.
e) The project holder will get the funds only when the backers approve the request.

f) When more than 50% of backers have decided to approve the request, the project holder will get the contributed amount directly without the interference of any third party entity.

This paper proposed the system having a simple and safe GUI to initiate the project without having any problems. They used ether as an option for storing the cryptocurrency in the blockchain. Also this system had a check where if the funds are not raised by the project holder in the given time then the transaction is not executed further. Hence providing the reliability to the investors.

4. COMPARISION TABLE

Table 1. Comparision of some Existing Papers

Sr No	Aricle No & Year	Outcomes	Merits	Limitations
1.	[2] 2019	Blockchain based crowdfunding stage was provided to give straightforward exchanges in decentralized framework	Increased contributor's confidentiality, All clients can see the records of every exchange which should be visible to utilizing Etherscan API	ERC-223 tokens not implemented into smart contracts which can have more benefits
2.	[12] 2018	talk about how blockchain can really and safely handle the connection between pledge drives, stages and the financial backers.	settling the vast majority of the issues related to people regarding the trust.	Figuring out a less expensive approach to addressing the constraints concerning the powerful use and registering assets by the distributed system utilized by the blockchain.
3.	[5] 2020	Presented an optimized solution on different types of crowdfunding like All-or-nothing,keep-it-all,stretched-goals-scheme using smart contracts.	Detailed research on 3 main types of Crowdfunding use cases and its solution with help of blockchain.	Implementation cost is high if the company decides to execute the whole blockchain process by themselves.
4.	[6] 2021	Provided a decentralized approach to the current crowdfunding system by removing any involvement of	Establishes a P2P i.e. peer-to-peer connection between the project holder and the investor	Chances of money laundering and fraud as there is no formal banking system.

		middle man and created an easy to use platform for both parties.		
5.	[8] 2020	A blockchain based application with the user interface to handle the startup fundraisers, making a startup, adding to a startup, making solicitation, supporting a solicitation and settling a solicitation.	Deployed on Metamask successfully with the help of bytecode obtained by compiling the smart contract.	The idea in the starting stages of different legitimate issues should be settled.
6.	[9] 2020	The project venturers provide the idea to the contributors. The contributors contribute to the project and instead have some equity share for themselves in the project.	Highlighted the feasibility of using the blockchain concept of decentralization to solve the current crowdfunding based problems.	Only the concepts were mentioned, no solid architectural models presented.
7.	[11] 2019	An application that provides interactive forms for creating, donating, and requesting approval of campaigns, facilitating the creation and funding of campaigns for both campaign creators and donors.	Bytecode is provided in blockchain where abi is in JSON form and interacts with the frontend.	Request Approval module is used by donors to give complete control over their invested money.
8.	[10] 2021	A multi-user web application that provides a reliable, secure and transparent decentralized solution.The application also creates transparency between funders and start-ups.	If the project is canceled prematurely, the funds will be returned to the backers.	Mainly focused on startups.Startups can track the status of their projects approval and funds raised in real time.

4.1 Comprehensive Analysis

The key challenge in the current study work was addressing the transparency problem. This was accomplished by implementing an ethereum-based payment mechanism that made all records visible to all users. Also, the idea of a spending request is presented. This idea limits the usage of money without the investors' consent.

The applications of existing crowdfunding research are only available for campaigns focused on charities. The money contributed by investors or contributors is frozen in these campaigns.The blockchain allows us to extend the same crowdfunding concept to new business ventures.Lack of capital causes many Indian startup firms to languish unattended. Putting new businesses on a crowdfunding site may increase investment opportunities. The investor's ability to sell his specific proportion of shares or ownership is the only need for the starting business.

Overall, crowdfunding using blockchain has the potential to transform the way startup ventures raise capital. By leveraging the transparency, security, and decentralization of blockchain technology, crowdfunding campaigns can be run more efficiently and effectively than ever before. However, it is important for startups to understand the challenges and limitations of the industry and to take steps to mitigate these risks. So, in our suggested system, we are attempting to expand the startup venture platform as described in the next section.

4.2 Proposed Solution:

Users on the platform can begin by purchasing tokens from the store in exchange for their local currency by using Gpay. A token (Crypto currency) created using the ERC20 standard is critical to the collective platform's overall investment strategy. Developing a platform-exclusive fungible token ensures that the investment medium used to invest in camps is only valid within the platform. Because the token is only purchasable and sellable within the platform, it has no real-world value outside of the platform. If a malicious user manages to steal these tokens and transfer them to another account outside the platform, the tokens will essentially be worthless because tokens only have value within the collective platform.When a new user creates a camp on the platform, he or she must enter the amount of tokens sought as well as the amount of equity offered in exchange for the investment.

When a user creates a new camp, a new Ethereum account is automatically created. When an investor attempts to invest in a camp, the corresponding token is transferred to the Ethereum account associated with the new camp. The valuation of the camp is calculated by taking into account the target and the equity offered by the camp.When a user creates a new camp, a new Ethereum account is automatically created. When an investor attempts to invest in a camp, the corresponding token is transferred to the Ethereum account associated with the new camp. The valuation of the camp is calculated by taking into account the target and the equity offered by the camp.

When a camp's goal is met, the camp is automatically closed using various conditions defined in the smart contract, eliminating the need for an intermediary third party. When the goal is met and the camp is closed, the owner of the camp can withdraw the funds raised. This smart contract-enabled crowdfunding system creates a transparent, trustworthy, and secure platform for the next generation of aspiring investors.

4.3 Limitations of our proposed solution

More inclined towards B2C business model. No scope for B2B as large funding is a bit hectic. Blockchain requires heavy computational power so transactions take time.

5. CONCLUSION

In this paper a survey was successfully executed on the available projects of crowdfunding using the blockchain. All the research is in the initial states. Feasibility of the blockchain is highlighted.This is because many people today use the Internet and online entertainment, which means that the project holder can connect people through these platforms. The use of blockchain technology in crowdfunding agreements could address issues such as abuse, confidentiality, and trust. The technology provides a less expensive, simpler, more secure, and more convenient method of exchanging information and transferring funds. Based on the study of various research papers, a conclusion has been made that blockchain technology has great potential for crowdfunding platforms due to its diverse features. Although currently, the technology can be used to change the role of platforms, in the future, it could be used to execute crowdfunding contracts without requiring institutional platforms.

Finally, the suggested mechanism that accepts ERC20 tokens as payment. Users may directly pay with Indian rupee, reducing their reliance on cryptocurrencies, while all transaction records continue to be updated in the blockchain. The suggested strategy is appropriate for start-up businesses since it also gives investors ownership.

6. REFERENCES

[1] Freedman"The Foundations of Online Crowdfunding", Equity Crowdfunding for Investors (eds D. M. Freedman and M. R. Nutting), 2015, doi:10.1002/9781118864876.ch1.

[2] Saadat, M.N., Halim, S.A., Osman, H., Nassr, R.M. and Zuhairi, M.F., 2019. Blockchain based crowdfunding systems. Indonesian Journal of Electrical Engineering and Computer Science, 15(1), pp.409-413.

[3] GABISON, G., 2019. Understanding crowdfunding and its regulations.

[4] Z. Zheng, S. Xie, H. Dai, X. Chen and H. Wang, "An Overview of Blockchain Technology: Architecture, Consensus, and Future Trends," 2017 IEEE International Congress on Big Data (BigData Congress), Honolulu, HI, USA, 2017, pp. 557-564, doi: 10.1109/BigDataCongress.2017.85.

[5] Ashari, F., Catonsukmoro, T., Bad, W.M. and Sfenranto, W., 2020. Smart contract and blockchain for crowdfunding platform. International Journal of Advanced Trends in Computer Science and Engineering, pp.3036-3041.

[6] Gururaj, H.L., Janhavi, V., Holla, A.M., Kumar, A.A., Bhumika, R. and Goundar, S., 2021. Decentralized application for crowdfunding using blockchain technology. International Journal of Blockchains and Cryptocurrencies, 2(1), pp.68-82.

[7] Zhu, H. and Zhou, Z.Z., 2016. Analysis and outlook of applications of blockchain technology to equity crowdfunding in China. Financial innovation, 2(1), pp.1-11.

[8] Yadav, N. and Sarasvathi, V., 2020, August. Venturing crowdfunding using smart contracts in blockchain. In 2020 Third International Conference on Smart Systems and Inventive Technology (ICSSIT) (pp. 192-197). IEEE.

[9] Baber, H., 2020. Blockchain-based crowdfunding. Blockchain Technology for Industry 4.0: Secure, Decentralized, Distributed and Trusted Industry Environment, pp.117-130.

[10] Patil, V., Gupta, V. and Sarode, R., 2021, November. Blockchain-based crowdfunding application. In 2021 Fifth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC) (pp. 1546-1553). IEEE.

[11] Benila, M.S., Ajay, V., Hrishikesh, K. and Karthick, R., 2019. CrowdFunding using Blockchain. GRD Journals, 4(4), pp.1-6.

[12] Zhao Hongjiang1 Cephas P.K Coffie,"The Applications of Blockchain Technology in Crowdfunding Contract",SSRN Electronic Journal,January 2018,

[13] A Study on Crowd Funding and its Implications in India Paripex, Prinsha K, Indian Journal Of Research, Volume: 5, Issue-1, January 2016.