Crowd Impact: A Blockchain-based Crowdfunding Platform for Impact Token

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Abstract- ***The practice of crowdfunding, a type of collective fund raising whereby small contributions or investments are made by groups of individuals in exchange for free goods or other accolades, has gained popularity. A class of tokens known as impact tokens uses blockchain technology to symbolize the beneficial social and economic effects of particular actions. CrowdImpact streamlines the impact token investment process by fusing Ethereum's smart contracts, blockchain technology, and a user-friendly React.js UI. This strategy tackles a crucial issue in the broad sector, where there are few excellent investment possibilities and large levels of market risk.***

Indexed Terms- ***Crowdfunding, Impact tokens, Blockchain, Sustainable Development Goals (SDG), Impact investing.***

I. INTRODUCTION

Crowdfunding has grown in popularity as a kind of communal fundraising in which tiny donations or investments made by groups of people promote the creation of new ventures in exchange for free items or other forms of recognition. Impact tokens, a group of tokens represent positive social and economic impacts of specific activities using blockchain technology.

This diverse industry is facing a major challenge with the limited number of high-quality investment opportunities. The proposed solution leverages robust blockchain technology, integrating a React.js application with the blockchain and wallet functionalities. Crowd Impact, a Web3.0 equity-crowdfunding platform[1], is at the core of this initiative. It is built on the Ethereum blockchain and utilises Solidity smart contracts to facilitate the underlying business logic.

This innovative platform empowers investors to identify and support high-quality projects that not only hold legitimacy but also contribute to the achievement of Sustainable Development Goals (SDGs). By combining the power of blockchain technology, Ethereum's smart contracts, and a user-friendly interface through React.js, CrowdImpact simplifies the process of investing in impact token projects. This approach addresses a critical challenge in the diverse industry, where high-quality investment opportunities are limited, and markets are marked by significant risk. With CrowdImpact, investors can confidently navigate this landscape, aligning their investments with their values while promoting positive social and economic impacts.

CrowdImpact's core features are centered on democratizing access to impact token investments while guaranteeing their legitimacy. Investors on the platform can explore a diverse array of campaigns that not only offer financial returns but also contribute positively to society and the environment, aligning with the overarching SDGs. One of its key advantages lies in its utilization of blockchain technology, which provides a transparent and immutable ledger, bolstering trust and accountability.

Through the implementation of smart contracts and decentralized infrastructure, CrowdImpact ensures secure transactions and the authenticity of impact tokens tied to their respective projects. Furthermore, its user-friendly interface caters to both novice and experienced investors, offering comprehensive campaign information, including specific social and economic impacts, projected returns, and associated risks. This commitment to transparency empowers investors to make well-informed decisions while mitigating potential risks.

II RELATED WORKS

Crowdfunding is a mechanism of raising capital for funding from investors for new business ventures. To facilitate crowdfunding, different crowdfunding platforms are available, such as Kickstarter and Indiegogo. Crowdfunding platforms provide a convenient way of raising funds for startups from investors. The major downside of the conventional crowdfunding platforms is that they require users to pay few percentages of the fundraised to the crowdfunding platforms as platform fees (e.g., Kickstarter charges 5% of the total fundraised as platform fee). In addition to platform fee, users are required to pay transaction fees to the payment processors. In this paper, we propose a secure and decentralized crowdfunding mechanism based on blockchain technology. The proposed crowdfunding mechanism eliminates the need of conventional crowdfunding platforms that charge entrepreneurs a sum of money as platform fees. The proposed mechanism allows entrepreneurs to make use of the total fundraised from investors and provides an immutable ledger of transactions between investors and entrepreneurs.[2]

The proposed blockchain-based crowdfunding trust system represents a paradigm shift, leveraging decentralized and transparent auditor committee to overcome fraudulent activities. At its core, a smart contract operates the selection of auditors, making a delicate balance between security and accuracy. This algorithm is based on random selection and capability matching, ensures an impartial auditing process within a distributed network. The auditors play a major role by evaluating crowdfunding campaigns, with the smart contract incentivizing integrity and honesty. The system is resilient against attacks has been rigorously tested through theoretical analyses, making it effective in various threat scenarios.[3] Furthermore, a prototype system is used to thorougly evaluate the scheme and its overhead including the influence of various system parameters. To bolster the system integrity, comprehensive measures have been implemented to guard the security of the smart contracts. Nevertheless, while this proposal is offering a promising solution a real-world application may encounter challenges related to scalability and driving ubiquitous user acceptance. Addressing these difficulties could be integral for the operational deployment and board-reaching triumph of this pioneering trust infrastructure.[4]

This research is based on empirical insights extracted from Kickstarter potrays the dynamics of crowdfunding in the real-world, encompassing 48,526 funding endeavors from 2009 to July 2012, accumulating $237 million in pledges. Noticably, 48.1% of projects, total of 23,719, successfully attained their funding objectives. Elimination of extreme values — 225 goals below $100 and 25 goals over a million dollars ensured data accuracy, while 3931 foreign projects started by US residents were excluded due to potential uniqness. Kickstarter's dominance in crowdfunding is visible, notably impacting the field through its reward-based model and influencing equity crowdfunding legislation.

However, disparities emerged between the research findings and Kickstarter's reported statistics. Kickstarter claimed 26,017 successful and 33,098 failed projects, indicating a 44.7% success rate during the study period, slightly diverging from the research data. Potential data extraction issues might underlie this discrepancy, possibly impacting the dataset's completeness. Nevertheless, while these discrepancies could influence coefficients, the fundamental significance of variables remains robust, offering valuable insights into crowdfunding dynamics and outcomes.[5]

The DeTEcT theory examines how various participants within blockchain-based token economies interact and influence economic dynamics. Time is segmented into different intervals within the blockchain's ledger system, initiating at a starting point (t0) and concluding at a defined end (tm). Individuals who are participating in these token economies are represented within the blockchain as seperate and unique entities, each owning digital assets or tokens enabling transactions. These individuals are grouped into various categories based on their roles and behaviors in the blockchain network. Over time, these roles could evolution or change due to numerous factors within the decentralized system.[6]

These groups of users with comparable jobs or functions are divided within the blockchain network.

To determine the total wealth inside the blockchain ecosystem, the total value of digital assets or tokens held by these categories is computed.

Developing a blockchain-based crowdfunding web application addresses the key concerns of transparency and security, especially important in platforms facilitating crowdfunding. This innovative solution aims to enable financial investment and to assure backers of guaranteed returns. Unlike other applications, this platform emphasizes transparency, ensuring backers are consistently informed about the progress of their invested startups. In cases where a project faces any termination, backers are assured refunds, bolstering their confidence. The application will function as a multi-user interface catering to three distinct user types: Admin, Backers, and Start-ups. Admin holds the authority to approve start-ups for listing, while start-ups gain real-time insights into their project approvals and fundraising status. Backers, on the other hand, access project progress updates and general information about other listed projects.[7]This comprehensive approach aims to foster trust, providing a secure and transparent environment for both backers and startups within the crowdfunding ecosystem.

The traditional centralized method has faced many obstacles in the field of crowdfunding, such as high transaction costs, fraudulent activity resulting from user anonymity, and data vulnerabilities. The implementation of blockchain technology presents itself as a game-changing resolution to these enduring problems. To successfully address these challenges, the report suggests merging blockchain technology with a digital identity management system.

The study demonstrates the core benefits of blockchain technology by using it to crowdfunding, taking advantage of its immutable and decentralized structure to reduce the danger of data breaches. By identifying malevolent individuals, the integration of a digital identity management system provides a tool for swift action against fraudulent activity within crowdfunding platforms.

Utilizing Ethereum as a framework, the research focuses on donation-based crowdfunding and has been empirically tested on the Rinkeby Test Network. The ability to run numerous crowdfunding campaigns at the same time is a noteworthy demonstration of the scalability and application of blockchain in many fundraising scenarios provided by this study.[8]

In addition, the work offers a thorough examination of the Solidity language-based smart contract, clarifying its crucial function in guaranteeing the security and openness of the suggested system. The results highlight the usefulness and efficiency of blockchain-integrated solutions in creating safe, open, and productive crowdfunding settings.

LikeStarter introduced an innovative approach to crowdfunding within a social platform, allows users to promote their creations while interacting in a token-based crowdfunding mechanism. Thanks to the platform's amazing feature, users may show their appreciation by giving likes, which have monetary and engagement values. Every 'like' results in a micro-donation that transforms Ether into Likoins, a system-exclusive ERC20 token. The Likoin serves as the cornerstone of the crowdfunding strategy, enabling a unique crowdsale technique controlled by social network processes in which post visibility is based on popularity.[9]

This innovative solution uses smart contracts to manage crowdfunding on its own without the need for middlemen. Similar to traditional crowdfunding, beneficiaries receive funds through likes on their posts or user pages. Likoin-holding donors receive perks, including the ability to buy artifacts made by recipients and vote in the management of the crowdsourcing campaign.

The ecosystem of the site consists of Likoins and Bucks, which contributors can exchange for Bucks in order to purchase artifacts. Notably, the price of the artifact is set by Likoin holders via a voting mechanism, which creates a participatory environment in which holders vote and recommend prices for the item collectively. This procedure starts an autocatalytic cycle that increases earnings for both donors and beneficiaries in a mutually beneficial way.

Because Likoins function as a derivative product, donors can profit directly from the sponsored artist's success. Conversions from Likoin to Bucks make this possible by increasing donors' Likoin holdings. In the

end, the platform functions as a Decentralized Autonomous Organization (DAO), in which beneficiaries and Likoin holders work together to increase the visibility, value, and Likoin worth of the artist.

FarmFund, a blockchain-based crowdfunding platform designed for farmers, represents a paradigm shift in the intersection of technology and agriculture. As highlighted in its whitepaper, this initiative aims to revolutionize the crowdfunding and fintech sectors by leveraging blockchain's capabilities to benefit both investors and farmers alike.

The absence of incentives for investors is one of the main problems with the current crowdfunding systems. By suggesting a mechanism in which investors receive a portion of their investment based on the profits produced by the farmer, FarmFund aims to rectify this mismatch. This guarantees a more just and advantageous agreement, bringing the interests of all parties into line.

Additionally, the platform tackles the long-standing issue of farmers not being able to effectively access capital. FarmFund hopes to expedite the procedure by utilizing blockchain technology, guaranteeing that farmers can easily obtain the funds they need when they need it. Additionally, the addition of a Credit Score system further strengthens the platform's dependability, boosting confidence among users and investors.[10]

The whitepaper highlights the use of a distributed ledger framework based on Plasma, demonstrating gasless transactions that add to the system's affordability. These features highlight the platform's dedication to effectiveness, openness, and usability for all parties involved in the crowdfunding ecosystem and the farming community.

High-quality content creation costs a lot of money. Content makers can raise money by using crowdfunding platforms. Because users have little control over the money they have invested, there is some danger associated with crowdfunding done the traditional way.

The integration of blockchain technology into the crowd-funding system is expected to mitigate fraudulent activities, remove intermediaries, and enhance the transparency and security of current crowdfunding platforms.

Smart contracts have been utilized in proposed blockchain-based crowdfunding platform implementations to manage fund expenditure and voting procedures to guarantee donor funds are not misappropriated. Currently, there isn't a blockchain-based platform available for creatives that can guarantee safe and decentralized crowdfunding in addition to offering a market for their funded works.[11]

II. PROPOSED METHODOLOGY

The major components of the suggested methodology are the use of smart contracts, simplification of the investing process, and platform architectural design. This method focuses on combining React.js and Solidity smart contracts to create an Ethereum-based crowdfunding platform that is user-centric. In order to ensure transparency, security, and well-informed investment decisions, it seeks to examine projects that are in line with the Sustainable Development Goals. By using these tactics, the approach hopes to create a reliable and significant crowdfunding environment while democratizing impact token investments.

Platform Architecture Design: Detailing the architecture of CrowdImpact, encompassing its integration with the Ethereum blockchain, Solidity smart contracts, and React.js application for a user-friendly interface.

Market Analysis and Project Vetting: Employing a comprehensive market analysis methodology to identify and vet high-quality projects aligned with SDGs. This involves evaluating social and economic impacts, risk assessment, and legitimacy checks.

Investment Process Simplification: Outlining strategies to streamline the investment process for impact token projects through smart contracts and intuitive user interfaces.

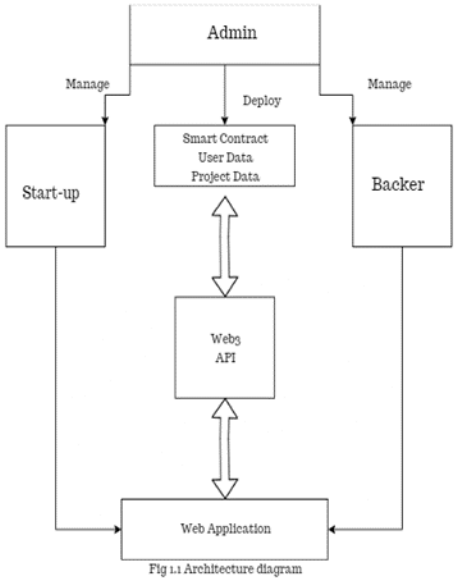

Fig.1.2 System design and architecture

As the proposed methodology was to design an inuitive web3 application Fig.1 was the first step of analyzing the different components of our application. An architectural flowchart of a crowdfunding platform comprises the smooth operation of its fundamental elements with the goal of promoting project development and fundraising initiatives. A smart contract, which uses Web3 ABI (Application Binary Interface) to communicate with the platform's frontend interface, is at the core of this architecture.

The two main parts of the architecture are 'Add Projects' and 'Back Projects.' Startups and project owners can build and list their initiatives on the site by using the 'Add Projects' section. Concurrently, the 'Back initiatives' module allows users—also called backers—to make financial contributions to the initiatives that are displayed. By interacting with the Web3 ABI, these parts create a communication link with the smart contract that is installed on a blockchain network. The logic driving crowdfunding operations is contained in the smart contract, which specifies features like project formation, fundraising acceptance, and fund distribution subject to predetermined guidelines or criteria. As the platform's user-facing interface, the frontend makes it easier for users to interact with its features. Startups can submit project details, and supporters can easily browse, pick, and fund initiatives that best suit their needs.

Smart-contract Architecture: Smart contracts are the cornerstone of blockchain technology; they are self-executing contracts with predefined conditions explicitly written into code. These digital agreements automate and enforce the terms of the agreement, eliminating the need for middlemen. Operating on a decentralized network, smart contracts ensure tamper-proof, transparent, and immutable actions, maximizing efficiency and trust across a variety of businesses. They allow parties to deal directly, securely, and verifiably, ushering in a new era of trustless and decentralized agreements in the field of blockchain technology. Applications ranging from supply chain management to financial transactions are made possible by this.

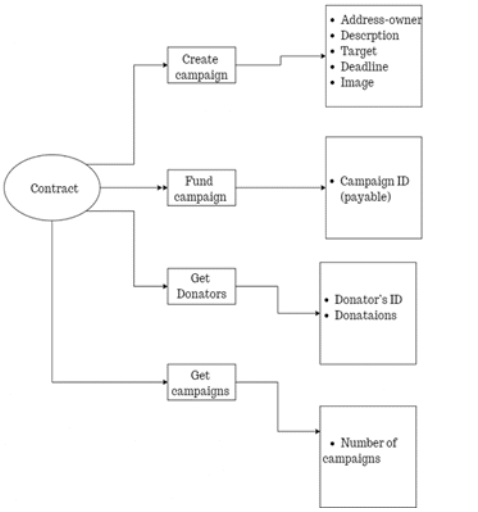

Fig.1.2 SmartContract

A decentralized mechanism for overseeing crowdfunding campaigns is contained in the "CrowdFunding" smart contract. It stores the essential details of every fundraising effort in a struct called "Campaign," including the owner's address, the campaign title, description, funding target, deadline, amount collected, related image, and the addresses and donations of the donors. Users can start a new campaign by specifying its owner, title, description, target, deadline, and image using the "createCampaign" function. In order to guarantee future-dated deadlines, it protects against invalid deadlines set in the past.

The "donateToCampaign" feature, which accepts Ether and logs the donor's address and donation amount, makes donations easier. Money is transmitted

straight to the address of the campaign owner, updating the total amount raised for that particular campaign. Additional features include getting access to all active campaigns kept in the contract and donor data, including addresses and donation amounts. Solidity's mapping and array structures are used in this contract to effectively manage several campaigns. It establishes accountability and transparency in crowdfunding operations, laying the groundwork for safe and decentralized fundraising.

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React – Frontend Development: In this project frontend is mostly based on React, a flexible JavaScript package well-known for its effectiveness in producing dynamic user interfaces. By utilizing React's component-based architecture, developers may create reusable, modular user interface components, improving the maintainability and scalability of their applications. The project makes use of a number of React-related tools and packages, such as React Icons to add a wide variety of icons to the user interface, React Hooks Global State to manage global state via hooks, and React Router Dom to enable smooth movement inside the application. React Moment is also used to integrate Moment.js, which makes it possible for dates and timings to be handled and modified easily within the application. React Toastify improves the user experience by offering a powerful notification system. These React-based libraries and tools enable the project's frontend to guarantee a dynamic, responsive, and user-friendly experience. Together, these components support modern development techniques and user expectations by facilitating improved navigation, state management, and visual enhancements in the application's frontend and facilitating an efficient and interactive user experience.

Blockchain and Backend development: This project's backend and blockchain components are what give it its functionality; they allow server-side operations and facilitate interactions with decentralized networks.
the Ethereum ecosystem which is backed by a variety of specialized tools and libraries—is essential. Fundamentally, the project uses packages relevant to Ethereum, including ethers, to enable easy communication with the Ethereum network. The application can carry out a number of functions with the help of this library, including sending transactions, communicating with smart contracts, and obtaining blockchain data.The project incorporates Hardhat, a potent Ethereum development environment.[12]

Hardhat: To expedite development and testing. Hardhat offers a comprehensive toolkit that streamlines the deployment and testing of smart contracts, including testing frameworks like Waffle. By providing more features and testing options, this environment supports @nomiclabs/hardhat-ethers and @nomiclabs/hardhat-waffle, improving the Ethereum development experience.@openzeppelin/contracts, a well-known library offering safe and tried implementations of several Ethereum smart contracts, facilitates the creation and administration of smart contracts. These contracts encompass a broad range of features, from more intricate decentralized finance (DeFi) components to token standards such as ERC-20.

IPFS – InterPlanetary File System: The project's use of ipfs-http-client to integrate IPFS (InterPlanetary File System) demonstrates distributed and decentralized file storing capabilities. IPFS is a scalable and robust data storage solution that supports decentralized application paradigms by enabling the storage and retrieval of immutable files.The project also makes use of a number of auxiliary technologies, such as Tailwind CSS for effective and responsive styling, Babel for transpiling JavaScript code, and dotenv for handling environment variables.In line with the tenets of blockchain technology and decentralized applications, this extensive backend and blockchain infrastructure offer a strong basis for the application, enabling it to securely communicate with the Ethereum network, effectively manage smart contracts, store data decentralized, and manage intricate decentralized operations.

RPC : Remote Procedure Call: Remote Procedure Call enables a software to ask another program via a network for a service or function. It operates using a client-server architecture, in which the client requests a process from the server and then watches for a response. By using this technique, the intricacies of network connection are abstracted, giving the impression that a local function is being called by the client. RPC facilitates smooth system interaction between disparate hardware and software configurations, hence augmenting the interoperability of distributed applications. It works by encapsulating function calls into a network-transmittable format, calling remote system procedures, and sending the requester's results back.

We have deployed the smart contract on goerli endpoint using RPC.

Metamask - Wallet

MetaMask is a browser extension and mobile app enabling users to interact with the Ethereum blockchain and decentralized applications (dApps). Serving as a crypto wallet, it allows secure storage of Ether and various ERC-20 tokens. MetaMask simplifies access to the decentralized web, providing a user-friendly interface for managing assets, initiating transactions, and interacting with smart contracts.It serves as a link between web browsers and the Ethereum network, allowing users to interact with, investigate, and take part in the growing ecosystem of NFTs, Decentralized Finance (DeFi), and other blockchain-based applications with ease.

Solidity – SmartContract

Solidity smart contracts are code-written, self-executing contracts that operate on the Ethereum blockchain and have predetermined conditions. They are essential to the operation of decentralized apps (dApps) because they enable trustless communication between parties, doing away with the necessity for middlemen.

It includes features that enable the establishment of fundraising campaigns, contributions to these campaigns, and the acquisition of campaign data. Using the 'createCampaign' feature, users can start fundraising campaigns by providing information about the owner, including their address, the campaign title, description, fundraising aim, deadline, and image. Notably, it guarantees that the campaign's deadline will remain in the future in order for it to remain valid. Once a campaign is created, users can donate to it by providing Ether and the campaign's identification number through the 'donateToCampaign' function. It forwards the Ether to the campaign owner while keeping track of the addresses and quantities donated by donors.[13] The contract modifies the total amount collected for that particular campaign if the transaction is successful. Furthermore, the contract offers capabilities for retrieving data regarding donors and their contributions for every campaign (called "getDonators") in addition to a function for retrieving data regarding all active campaigns (called "getCampaigns"). Anyone can access the data of active crowdfunding projects on the platform by using the latter feature.

III. IMPLEMENTATION AND OUTCOMES

The whole system was designed and tested on the Windows 100x64 Operating System. React.js GUI was used as the development environment. As the Dapp is built on Ethereum's Goerli testnet, we have connected our application to etherscan where the transactions can be viewed.

Figures 4-6 illustrated the implementation of the proposed system.

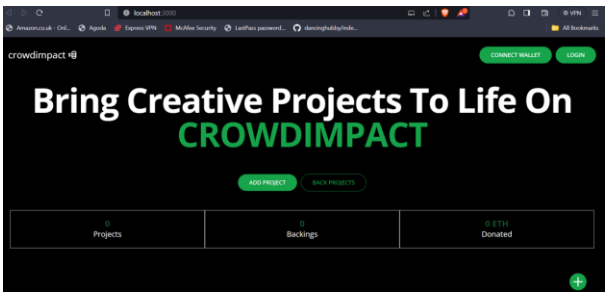

Fig 4. This is the homepage of our Dapp

Fig.5 This is MetaMask wallet connection which is used for the backing and transaction.

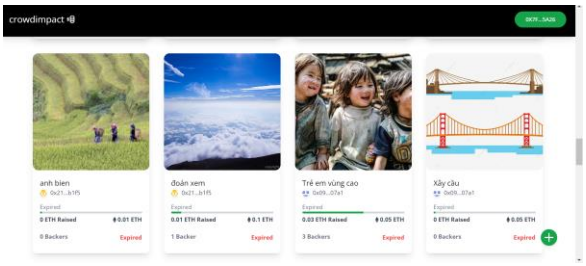

Fig 6 this is the list of all the projects that are deployed into the network. These projects contains all the details required know the project and invest in it.

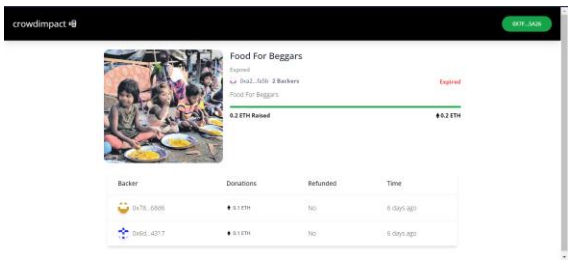

Fig 7 This is the project page – it has all the details of the project which includes the name, list of backers, time and the address, raised amount, expiry date, project description.

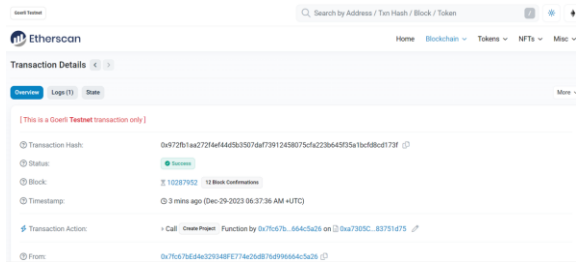

Fig 8 This is the transaction added to the Goerli testnet

Two factor authentication: In the future, we'll be concentrating on strengthening platform security by introducing reliable two-factor authentication for CrowdImpact. Integrating user verification and secure authentication techniques will strengthen account access, guaranteeing a safer atmosphere for investors and project developers and increasing confidence in the dependability and integrity of our platform intermediary.

Multiple wallet access: One of our next priorities will be to make CrowdImpact compatible with numerous wallets. Thanks to this improvement, users will have more control over their holdings and contributions throughout the platform and will be able to manage a wider range of investments and portfolios using different wallets, which will ensure convenience.

CONCLUSION

In line with the Sustainable Development Goals (SDGs)[14], the CrowdImpact project addresses the issue of scarce high-quality investment opportunities by combining crowdsourcing and blockchain technology in a novel way. Impact token investments are made simpler by utilizing React.js UI and Ethereum's smart contracts. The platform is driven by the Solidity smart contract, which facilitates the establishment of campaigns, donations, and transparency. Robust two-factor authentication and multi-wallet access are planned in the future to improve security and user flexibility. These developments are consistent with the goal of enhancing platform dependability and user confidence. The plan for the project places a strong emphasis on user-centric features with the goals of diversified investment management and safe access. The goal of more research into data analytics tools is to provide investors with thorough understandings so they can make wise decisions. CrowdImpact is committed to democratizing impact token investing and building a safe, open, and intuitive ecosystem for projects with lasting effects.

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REFERENCES

[1] M. S. Benila, V. Ajay, K. Hrishikesh, and R. Karthick, "Crowd Funding using Blockchain," *GRD Journals-Global Research and Development Journal for Engineering*, vol. 4, 2019, [Online]. Available: www.grdjournals.com

[2] B. Chen *et al.*, "Blockchain-based Decentralized Co-governance: Innovations and Solutions for Sustainable Crowdfunding," Jun. 2023, [Online]. Available: http://arxiv.org/abs/2306.00869

[3] Y. Xu *et al.*, "A decentralized trust management mechanism for crowdfunding," *Inf Sci (N Y)*, vol. 638, Aug. 2023, doi: 10.1016/j.ins.2023.118969.

[4] V. Patil, V. Gupta, and R. Sarode, "Blockchain-Based Crowdfunding Application," in *Proceedings of the 5th International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud), I-SMAC 2021*, Institute of Electrical and Electronics Engineers Inc., 2021, pp. 1546–1553. doi: 10.1109/I-SMAC52330.2021.9640888.

[5] E. Mollick, "The dynamics of crowdfunding: An exploratory study," *J Bus Ventur*, vol. 29, no. 1, pp. 1–16, Jan. 2014, doi: 10.1016/j.jbusvent.2013.06.005.

[6] H. Liu, J. Li, S. Yuan, W. Cao, and B. Li, "A Smart Contract based Crowdfunding Mechanism for Hierarchical Federated Learning," May 2022, [Online]. Available: http://arxiv.org/abs/2205.06101

[7] "aWEshkar_March_2018".

[8] M. Nazmus Saadat, S. A. Halim, H. Osman, R. M. Nassr, and M. F. Zuhairi, "Blockchain based crowdfunding systems," *Indonesian Journal of Electrical Engineering and Computer Science*, vol. 15, no. 1, pp. 409–413, Jul. 2019, doi: 10.11591/ijeecs.v15.i1.pp409-413.

[9] M. Zichichi, M. Contu, S. Ferretti, and G. D'Angelo, "LikeStarter: A Smart-contract based Social DAO for Crowdfunding," in *INFOCOM 2019 - IEEE Conference on Computer Communications Workshops, INFOCOM WKSHPS 2019*, Institute of Electrical and Electronics Engineers Inc., Apr. 2019, pp. 313–318. doi: 10.1109/INFCOMW.2019.8845133.

[10] D. H. Jhaveri, "CROWDFUNDING AT INDIA A STUDY OF INDIAN ONLINE CROWDFUNDING PLATFORMS." [Online]. Available: www.ketto.org

[11] C. Mohit Bahal, "Role of Crowdfunding in Financing Start-Ups and SME in India," 2017.

[12] V. Buterin, "Ethereum: A Next-Generation Smart Contract and Decentralized Application Platform."

[13] S. Damle, M. H. Moti, P. Chandra, and S. Gujar, "Designing Refund Bonus Schemes for Provision Point Mechanism in Civic Crowdfunding," Oct. 2018, [Online]. Available: http://arxiv.org/abs/1810.11695

[14] "Our work supports Sustainable Development Goal 13 and 14."

[15] R. Prasad, Y. Satyasai, J. Nanda, P. Singh, R. Meng, and H. Lim, "Algorithms for Intelligent Systems Proceedings of the International Conference on Paradigms of Computing, Communication and Data Sciences PCCDS 2022."