BLOCKCHAIN BASED CROWDFUNDING PLATFORM

A dissertation submitted in partial fulfilment of the requirements for the award of the degree of

MASTER OF COMPUTER APPLICATIONS

Of

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

By

ADITYA S JAIN
1AT22MC002

Under the Guidance of

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Anandnagar, Bangalore-560 024
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CERTIFICATE

This is to certify that Mr. **ADITYA S JAIN** bearing USN **1AT22MC002**, has completed his final semester project work entitled **"BLOCKCHAIN BASED CROWDFUNDING PLATFORM"** as a partial fulfilment for the award of Master of Computer Applications degree, during the academic year 2023-2024 under our supervision.

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This is to certify that Mr. **ADITYA S JAIN** bearing USN **1AT22MC002**, had successfully executed and completed the project entitled **"BLOCKCHAIN BASED CROWDFUNDING PLATFORM"** in the Department.

During this period, he was found to be good and disciplined.

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DECLARATION

I, **ADITYA S JAIN**, Student of 4th MCA, Atria institute of technology, Bengaluru, bearing USN **1AT22MC002** hereby declare that the project entitled **BLOCKCHAIN BASED CROWDFUNDING PLATFORM** has been carried out by me under the supervision of Guide **Dr. GOMATHY PRATHIMA E**, Associate Professor and Co-guide **Dr. GOPAL R**, Assistant Professor and submitted in partial fulfillment of the requirement for the award of the Degree of Master of Computer Applications by the Visvesvaraya Technological University during the academic year 2023-2024. This report has not been submitted to any other Organization/University for any award of degree or certificate.

Aditya

Signature of the Student

Place: Bangalore.

Date: 23/07/2024

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The foundation for any successful venture is laid out not just by the individual accomplishing the task, but also by several other people who believe that the individual can excel and put in their every bit in every endeavor he/she embarks on, at every stage in life. In addition, the success is derived when opportunity meets preparation, also supported by a well-coordinated approach and attitude.

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Abstract:

Blockchain expertise, known for its decentralized, transparent, and secure solutions, has transformed various industries. This paper explores the significant potential of integrating blockchain into crowdfunding, the repetition of raising capital through contributions from friends, family, customers, and investors. We propose a blockchain-based crowdfunding platform designed to enhance accessibility, efficiency, and trust. The platform leverages smart contracts to automate the funding process, ensuring that funds are only released upon meeting predefined conditions, thus reducing fraud and increasing transaction security. Blockchain's inherent characteristics guarantee the immutability and transparency of all transactions, providing a verifiable audit trail. Additionally, the platform incorporates tokenization, allowing contributors to receive digital tokens in exchange for their aids, which can be traded or utilized within the ecosystem.

Keywords: Blockchain, Crowdfunding, Smart Contracts, Decentralization, Tokenization, Transparency, Security, Efficiency, Regulatory Compliance.

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1. INTRODUCTION

Blockchain technology is a ground-breaking breakthrough that has the potential to alter a variety of industries by providing a secure, transparent, and decentralized method of recording and sharing data. At its core, blockchain is a form of digital ledger that stores transactions in a series of blocks. Each block comprises a list of transactions, which are connected together in a chronological chain, hence the term "blockchain." One of the most amazing aspects of blockchain is its decentralization, which implies that no single party owns the entire ledger. Instead, nodes are a network of computers that collaboratively maintain and verify the ledger.

In a classic centralized system, the transaction database is managed by a sole authority, such as per a bank or the government. This central authority has the ability to change or manipulate data, raising concerns about trust and security. Blockchain knowledge solves this problem by sharing the ledger among various nodes in the network. Every participant in the network has a copy of the complete ledger, which is regularly synchronized to assure consistency. This decentralized approach makes it incredibly difficult for anyone to tamper with the data, as changing a single block would necessitate modifying all following blocks on each copy of the ledger, which is nearly impossible.

The implementation of cryptographic algorithms enhances the security of blockchain. Each chunk in the chain includes a unique cryptological hash of the previous one, forming a safe link between them. If any information in a block is changed, the hash changes, breaking the chain and informing the network of the tampering attempt. This immutableness ensures that once a transaction has been recorded on the blockchain, it can’t be modified or deleted, resulting in a reliable and permanent record of all transactions.

Blockchain skill has gained renown for its application in cryptocurrencies as of Bitcoin and Ethereum, where it enables a safe and transparent method of transferring digital assets without the necessity for intermediaries. However, its applications go far beyond cryptocurrency. Blockchain knowledge can be used in supply chain management to monitor the transit of goods from manufacturer to consumer, increasing transparency and lowering the risk of fraud. In healthcare, it can offer a secure and tamper-proof method of storing and sharing patient records. Blockchain technology can protect voting systems from tampering by providing a clear and verifiable record of votes.

The concept of smart contracts is another effective use of blockchain technology. Smart contracts are self-executing contracts in which the terms of the agreement are encoded directly into code. They automatically enforce and execute contract obligations when

predetermined circumstances are satisfied, eliminating the need for middlemen and lowering the chance of conflicts. Smart contracts are very valuable in fields such as finance, real estate, and legal agreements because of their automation and reliability.

Finally, blockchain technology introduces a new paradigm of trust, security, and efficiency by allowing for the decentralization and transparency of information recording and sharing. Its potential uses are many and varied, and as the technology continues to improve, it is anticipated to have dramatic impact many industries, stimulating innovation and improving processes across the board.

1.1 TYPES OF CROWDFUNDING

The type of crowdfunding to be used usually hinge on the kind of business or activity that is being set up. The goals and objectives of the corporate influence the type as well. There are 3 basic types of crowdfunding. They are:

- **Debt form of Crowdfunding:** In this medium, the investors or rather contributors are paid the money back along with interest. It is also known as 'peer to peer' lending and usually does not involve the traditional banking methods.
- **Equity based Crowdfunding:** In this method, the investors become partially the owners of the business project. This stands in a way kind of a gamble because, if the project is successful, the share value will go up, otherwise down.
- **Donations:** In this medium, the investors don't look for any kind of financial returns. They invest in their belief on the project which is usually cause-based. However, perks can be given in directive to show gratitude towards the donators. Examples of these kind of projects are, charities, disaster relief, and other not-for-profit organizations.

The blockchain also keeps a record of every transaction, so everyone can see where the money is going. This builds trust because it's transparent and harder for anyone to cheat or misuse the funds.

Plus, because it uses digital money (cryptocurrency), people from all over the world can support your project easily and quickly. And if your project becomes successful, people who donated might even get special digital tokens that could increase in value over time.

Overall, it's a way for anyone with a great idea to get support from others without the usual

hassles, and it opens up new chances for funding projects globally.

1.2 Problem Statement

Crowdfunding has become a widely used way for raising funds for various projects, causes, or individuals in need. The COVID-19 pandemic has accelerated the growth of crowdfunding activities globally, ranging from small campaigns providing oxygen and medical assistance to large-scale funds like PM Cares.

However, current crowdfunding platforms face several major issues:

- **Security**: As fund sizes increase, ensuring their security becomes critical. Despite the use of stringent measures like symmetric encryption to secure e-payments, vulnerabilities to hacking remain. Blockchain _knowledge, that has not been stayed compromised, offers a higher level of security.
- **Transparency and Anti-Fraud**: Many crowdfunding scams have occurred, with a nonexistence of transparency regarding fund usage. There is no method to track how the funds are spent. Our aim is to brand the entire fund flow transparent at every stage, eliminating the possibility of misuse.
- **Global Contribution**: Many platforms are country-specific, making it tough for people in other countries to contribute to campaigns. Blockchain technology allows anyone worldwide to donate to a campaign quickly and conveniently, regardless of geographic location.

1.3 Objectives of Crowdfunding:

1. **Decentralization**: Utilizing blockchain knowledge allows crowdfunding platforms to operate without mediators such as banks or traditional economic institutions. This decentralized approach enhances transparency, lowers costs, and reduces the risk of censorship or manipulation.
2. **Global Access**: Blockchain-based crowdfunding enables participation from a worldwide audience. Anyone with internet access and cryptocurrency can contribute to projects, regardless of their location or financial status. This broadens the reach of

fundraising campaigns and allows projects to garner support from a diverse group of contributors.

3. **Transparency and Security**: Blockchain technology ensures transparent and immutable transaction records. All fundraising activities, including contributions and disbursements, are documented on the blockchain, providing accountability and transparency. The use of cryptographic methods enhances transaction safety and reduces the risk of fraud or tampering.
4. **Smart Contracts**: Blockchain-based crowdfunding often employs smart agreements, which are self-executing contracts with terms straight written into code. Smart contracts automate the fundraising process, releasing funds to project creators based on predefined conditions or milestones. This minimizes the need of faith between parties and decreases the risk of fund mismanagement or misuse.
5. **Access to Capital**: Blockchain-based crowdfunding offers an alternative capital source for projects that may struggle to obtain traditional financing, such as venture capital or bank loans. Entrepreneurs, startups, and innovators can raise capitals directly from the community, bypassing traditional gatekeepers and regulatory obstacles associated with conventional fundraising methods.

1.4 Scope of Crowdfunding:

1. **Startup Funding**: Blockchain-based crowdfunding platforms offer startups and early-stage companies an alternative means of raising capital. Entrepreneurs can issue tokens or digital properties over initial coin offerings (ICOs) or token sales, allowing them to bypass traditional fundraising methods such as venture capital or bank loans.
2. **Decentralized Finance (DeFi)**: In the decentralized finance (DeFi) ecosystem, crowdfunding is essential. DeFi platforms use blockchain knowledge to create financial products and services without intermediaries. These platforms utilize crowdfunding mechanisms like liquidity pools, lending protocols, and decentralized exchanges (DEXs) to enable peer-to-peer lending, borrowing, and trading of digital assets.
3. **Real Estate Investment**: Blockchain-based crowdfunding facilitates fractional ownership of real estate assets, allowing depositors to buy and trade tokens representing fractional shares of properties. This provides access to real estate markets previously unavailable to individual investors, offering benefits of liquidity and diversification.

4. **Tokenization of Assets**: Crowdfunding platforms can tokenize various assets, including artwork, intellectual property, commodities, and collectibles. By converting real-world assets into digital tokens on a blockchain, these platforms enable fractional ownership, enhance liquidity, and simplify the transfer of ownership.
5. **Social Impact Projects**: Blockchain-based crowdfunding can support social impact projects and charitable initiatives by offering a transparent and accountable fundraising mechanism. Donors can monitor fund allocation in real-time, ensuring their charities are effectively used for social causes and humanitarian efforts.
6. **Reward-Based Crowdfunding**: Blockchain technology can improve traditional reward-based crowdfunding models by adding transparency, security, and automation through smart contracts. Contributors can receive digital tokens or rewards issued on the blockchain in return for their contributions, ensuring fair and transparent distribution of incentives.

2.LITERATURE SURVEY

Santaute et.al [1] had examined the significance of criteria in selecting blockchain-based crowdfunding ventures and the expertise of investors in this domain. Demographic data revealed that the majority of investors were males, typically aged between 25 and 30 years, and held advanced educational qualifications such as bachelor's or master's degrees. Most defendants had previous experience investing in blockchain-based crowdfunding projects, citing familiarity with various platforms, notably Tecra Space as the most recognized. The investigation employed VAS matrices and VASMA-L methodology to judge the importance of criteria sets for investing in blockchain-based crowdfunding ventures.

The study used the VASMA-L methodology, which is a modified weights method that is suitable for large criteria sets. The VASMA-L methodology involves the following steps:

1. Split the initial criteria set into smaller subsets built on the recommended number of criteria in each subset.
2. Determine the importance weights of each subset using a methodology such as SWING, DR, or AHP.
3. Create a separate VAS matrix question for each subset and include them in the same survey.
4. Spread the survey among respondents and record the data collected separately of the matrix questions into separate decision matrices.
5. Calculate non-normalized VASMA weights for individually of the subsets.
6. Calculate global VASMA weights by combining local VASMA weights calculated separately from each decision matrix into a single set of VASMA weights.

The VASMA-L methodology is castoff to analyze and compare the importance of the criteria of large parameter sets.

According to authors Md Nazmus Saadat et.al. [2] the primary advantage of integrating blockchain into crowdfunding platforms is the heightened confidentiality for contributors, enabled by the transparent nature of blockchain transactions, which allows all users to access transaction records. Additionally, the execution of smart contracts negates the necessity for trust from every stakeholder in the campaign, as the contracts execute automatically upon meeting predefined conditions. The suggested approach to thwart fraud and delays in crowdfunding involves the integration of Ethereum smart contracts into the crowdfunding platform, ensuring the automatic completing of contracts. This guarantees timely project delivery within specified durations and mitigates the jeopardy of fraud.

Mithsara W.K.M., Jinasena T.M.K.K [3] had discussed about how blockchain has helped to scale up the business in public and private sectors. proposed platform encompasses risk reduction, bolstered trust via decentralized decision-making and transparent dealings, and the potential to broaden access to funding for expansive business projects.

Identified drawbacks of traditional investment methods, as unearthed in the study through a questionnaire disseminated to entrepreneurs and employers, include diminished interest rates, hurdles in cultivating trust with stakeholders, and supplementary fees. Additional challenges highlighted entail decision-making complexities, profit-sharing dilemmas, and apprehensions regarding co-investment with individuals engaged in illicit activities.

Atluri Divija Choudary [4] explains that reflects on history, traditional practices such as extending small loans to impoverished families and offering microcredits to aspiring small-scale entrepreneurs, who lacked eligibility for bank loans, were prevalent.

Invariably, new technologies and innovations exert profound impacts on individuals and society. The advent of novel technologies inevitably disrupts established ones. This shift is notably evident in crowdfunding, where there has been a notable surge in the number of projects launched through crowdfunding platforms. that blockchain knowledge holds potential for applied applications such as crowdfunding, enabling transparency and authentic disclosure of financial activities related to projects. Given investors' inclination towards prompt outcomes and active engagement, blockchain can furnish the transparency and stakeholder participation needed to monitor organizational performance and offer guidance accordingly. Recognizing the advantages of blockchain technology, it is recommended to allocate more resources to explore its utilization across diverse applications to fully attach its possible.

Aby Varghese, et.al [5] an article published in the International Research Journal of Modernization in Engineering Technology and Science, delves into a proposed methodology for a crowdsourcing and crowdfunding platform leveraging blockchain and collective intelligence. This methodology entails employing a smart agreement to execute, oversee, and document transactions for project creators and investors, alongside a decentralized application on the Ethereum blockchain for storing campaign details, contributions, withdrawal requests, and funds on a transparent and secure blockchain network accessible to all. Furthermore, the article examines the pros and cons of integrating blockchain technology into crowdfunding platforms. It explores the potential advantages of blockchain skill in crowdfunding platforms

and underscores the significance of innovating new solutions to address current shortcomings in existing crowdfunding platforms.

Firmansyah Ashari, Tetuko Catonsukmoro [6] say that blockchain has the potential to enhance trust among donors in the fundraising process by offering a dependable and secure database that instills confidence. The immutable nature of data storage in blockchain ensures that information stored within this framework is highly reliable. Furthermore, blockchain technology securely records all historical transactional data among involved parties, rendering it resistant to alteration. This guarantees donors that their data remains safeguarded and immune to tampering.

Furthermore, the elimination of intermediaries from the fundraising process empowers donors to directly verify data, enhancing trust further. Through the implementation of smart contracts, transactional data becomes unique and resistant to loss or alteration, further bolstering the credibility of the process.

Sheetal Phatangare [7] explains utilizing smart contracts can optimize the crowdfunding process in multiple aspects. Initially, they can guarantee that funds are securely held in escrow until meeting a predetermined goal or deadline, safeguarding investors from fraudulent activities and improper fund utilization. Secondly, smart contracts can enhance the transparency and accountability of crowdfunding campaigns by rendering all transactions public and irreversible, thus thwarting any attempts to manipulate financial records. Thirdly, smart contracts have the likely to eliminate intermediaries like traditional financial institutions or crowdfunding platforms, thereby diminishing transaction costs and associated fees. Lastly, smart contracts can streamline automation and efficiency, facilitating expedited disbursement of funds to developers and beneficiaries.

Furthermore, the document explores the incorporation of blockchain and crowdfunding, highlighting how blockchain technology can augment crowdfunding efforts by enhancing data security, transparency, and mitigating issues with duplicated payment records. Moreover, the aids of employing a decentralized platform for managing donations are discussed.

Ayush Kumar Singh [8] in their survey paper intentions to provide an inclusive summary of research and developments in blockchain-based crowdfunding. It entails reviewing existing literature, highlighting key concepts and mechanisms, discussing benefits

and challenges, and exploring potential future directions in this dynamic field of study. the paper underscores the risk of fraud and project delays stemming from the absence of regulation in the crowdfunding landscape. Additionally, it identifies various technical hurdles that warrant attention, including scalability, performance, and governance issues. Nonetheless, the paper posits that blockchain-based crowdfunding has the latent to tackle many of these obstacles by furnishing a distributed, secure, and transparent fundraising platform that benefits both project creators and contributors.

Traditional crowdfunding and blockchain-based crowdfunding exhibit distinct characteristics. Conventional crowdfunding usually relies on a centralized platform for transaction management, whereas blockchain-based crowdfunding utilizes distributed ledger technology to promote transparency, security, and efficacy. Moreover, blockchain-based crowdfunding provides more direct investor access, minimizing the involvement of intermediaries and expanding its global reach. The addition of smart contracts in blockchain-based crowdfunding streamlines the entire fundraising process, obviating the necessity for intermediaries and centralized entities. In summary, blockchain-based crowdfunding has likely to deliver increased transparency, improved security, and decreased costs relative to traditional crowdfunding approaches.

[9] The paper outlines a methodology for constructing a web-based crowdfunding platform utilizing blockchain technology. This proposed system employs Ethereum smart contracts and the solidity programming language to enhance trust, transparency, fund control, and transaction security. Infura is utilized to establish a dependable connection between the web system and the Ethereum network, ensuring the safe and credible recording of all transactions. The paper also extends gratitude to Dr. Sanjay U. Bokade, Prof. S. P. Khachane, Prof. Dilip Kale, and colleagues and friends for their valuable contributions to the successful completion of the project. Furthermore, the paper cites various sources pertaining to blockchain-based crowdfunding applications, trust-building models, and secure transactions.

Several benefits of crowdfunding encompass supporting innovative thoughts that might not attract backing from conventional channels, the prospect of lowered funding expenses owing to reduced fees, enhanced transparency and accountability, and accessible funding avenues for individuals and startups lacking prior financial support. Nonetheless, drawbacks include the absence of regulatory supervision, susceptibility to fraud and fund misappropriation, and inadequate funding for intricate and costly ventures. Other concerns

entail the possibility of a few dominant platforms, the risk of investor cognitive biases, and limited diversity in funding origins.

Raunak Sulekh and Manas Katiyar [10] says the procedure of initiating, participating in, and withdrawing funds from a campaign utilizing Ethereum blockchain technology. It elucidates the writing of contract code in Solidity, employed for deploying contracts on the blockchain platform, and elucidates the timing of campaigns for fundraising. Furthermore, it delineates the requisite procedures for creators and contributors to undertake before they can input and withdraw funds for a campaign.

Smart contracts play a vital role in the proposed crowdfunding platform leveraging blockchain technology. These contracts automate the crowdfunding process and eliminate intermediaries, thereby enhancing efficiency. Smart contracts are essentially self-executing contracts with terms directly encoded into lines of code.

Smart contracts are employed to confirm that funds are disbursed to startups only if specific predetermined conditions are met. For instance, they can be programmed to release funds to a startup only upon reaching a designated funding goal or meeting certain milestones. This minimizes risk for investors, as they can be guaranteed that their asset will not be misused or mishandled. In essence, smart contracts serve as an automated agreement between campaign creators and contributors. They guarantee that transactions occur as intended, bypassing intermediaries, and enabling all participants to agree upon the transaction rules.

Prof D. L. Falak [11] aim at the research project outlined in the paper is to introduce a crowdfunding platform utilizing blockchain technology, offering a secure, trustworthy, and transparent means of raising funds. The paper endeavors to develop interactive interfaces for initiating campaigns, making donations, and obtaining approval, simplifying the process for both campaign creators and donors to initiate and support campaigns. Donors can monitor the funds they contribute, with all transactions documented and stored as blocks in the blockchain. The primary goal is to mitigate the inherent risks associated with traditional crowdfunding methods by adopting a decentralized approach that integrates peer-to-peer smart contracts for crowdfunding.

Blockchain technology records all transactions and stores them in blocks, enabling a decentralized crowdfunding approach that mitigates risks inherent in conventional

crowdfunding methods. This incorporates peer-to-peer smart contracts for crowdfunding, eliminating the conventional transaction fees and platform charges typically associated with other crowdfunding platforms.

The paper of Ashrit Chattani, Akash Sharma [12] delineates a methodology for scrutinizing and tackling constraints present in prevailing crowdfunding and charity frameworks. This encompasses scrutinizing the necessity for trust and dependability in crowdfunding platforms, the significance of transparency in charitable contributions, and the prospect of blockchain technology to enhance these frameworks. The methodology entails conducting a survey of extant systems, researching regulations concerning charity and crowdfunding, and pinpointing deficiencies and prospects for enhancements within the present frameworks.

The PDF examines the strengths and weaknesses of current crowdfunding and charity systems. Crowdfunding's benefits encompass serving as a popular avenue for startups to garner funds. Conversely, its drawbacks entail the platforms' imposition of steep fees, susceptibility to fraudulent campaigns, and opacity in transactions. As for charity systems, their advantages lie in their potential to address significant societal concerns positively. However, they are hindered by charity organizations limited financial transparency and challenges in ensuring the efficient utilization of donations.

Shrishti Varshneya et.al [13] explained about the MetaMask that serves as a browser extension enabling users to link their Ethereum wallets to the browser interface and engage with decentralized applications on the Ethereum network. This extension functions as a digital wallet, allowing users to store and oversee their Ethereum tokens. MetaMask enhances Ethereum's usability by providing a user-friendly interface for tasks like checking account balances, conducting transactions, endorsing messages, and interacting with blockchain-based smart contracts. When integrated into a crowdfunding web platform, MetaMask enables users to seamlessly connect their wallets and contribute to campaigns with ease.

Crowdfunding platforms based on blockchain technology can provide numerous advantages, including heightened security, enhanced transparency, reduced fraud, streamlined fund management, and automated fund disbursement based on predetermined conditions. Though, there is various risks inherent in blockchain-based crowdfunding, such that considerable volatility of cryptocurrency, regulatory uncertainty, and investment risks.

Additionally, these platforms encounter regulatory hurdles that necessitate robust and transparent regulations to foster the sustained growth and stability of the industry.

The Paper entitled "Crowdfunding using Blockchain Technology," by Saniya Zad et.al [14] from the Academy of Mumbai, explores crowdfunding as an alternative financial mechanism facilitating fundraising for projects or campaigns. It operates through online funding platforms where contributors can endorse ideas and ventures with modest contributions. The authors highlight the proliferation of crowdfunding platforms such as Kickstarter, Indiegogo, and MyStartr, alongside an examination of the advantages and risks related with crowdfunding for both investors and companies. Additionally, the paper delves into the rationale behind crowdfunding, emphasizing its capacity to support startups, small enterprises, and innovative concepts in securing financial backing swiftly and without upfront fees.

Blockchain technology, according to Bogdan Tiganoaia et al. [15], is essential to achieving the Supportable Development Goals. UNESCO has settled Education for Sustainable Development (ESD) as a reply to the urgent problems facing the globe. Donations to nonprofit purposes, like as education, have typically been handled by opaque groups using centralized processes. Donors are frequently unclear about how their gifts will be used. But blockchain technology, particularly on platforms like Ethereum and Polygon, provides a response to the drawbacks of traditional donation methods. In the situation of supportable development, this article proposes a decentralized web3 application that uses blockchain skill to increase the efficiency and transparency of educational donations. The platform guarantees safe and transparent transactions by utilizing smart contracts and decentralized protocols. This gives contributors the ability to have an eye on how their aids are being allocated and confirm that the money is going to the right people. The platform's characteristics and ability to completely transform the way charity donations are made are highlighted in this paper's exploration of the platform's architecture and implementation.

2.2 EXISTING SYSTEM AND PROPOSED SYSTEM

2.2.1 EXISTING SYSTEM

Traditional crowdfunding platforms like Kickstarter, GoFundMe, and Indiegogo rely on centralized systems where a single organization manages all transactions, user data, and platform operations. These platforms have several limitations:

1. **Centralized Control:**

   A platform's centralized control consists of numerous key components. First and foremost, data administration is centralized, with all user information, transaction records, and campaign details kept in central databases. This centralization increases the danger of data breaches, which compromise critical information. Second, transactions are handled through traditional payment gateways, which might result in higher fees and longer processing times than current alternatives. Third, there are transparency difficulties since users must rely on the platform to deliver accurate data on fund utilization and campaign progress, which is typically done without external confirmation. Finally, censorship and control are important problems, as the platform has the right to accept or reject campaigns and end them at any time, frequently without explanation. This concentration of power may erode user trust and restrict the autonomy of campaigners.

2. **Security Concerns:** Centralized platforms raise substantial security problems. Data breaches pose a significant danger because these platforms are popular targets for hackers that could jeopardize user data and finances. The centralized nature of these networks makes them appealing to hackers, who may get access to massive amounts of sensitive data. Additionally, the risk of fraud and frauds has increased. The absence of transparency in how money is used afterward they are raised creates a climate conducive to fraudulent campaigns. Users may struggle to verify the legality of campaigns and follow the actual use of their contributions, raising a risk of fraud and financial loss.
3. **High Fees:** There are _uncountable reasons why costs on centralized platforms are so high. Payment processing fees are a major component, as platforms charge to handle transactions. These fees can be high, especially for international transfers where

currency translation and cross-border transaction expenses pile up. Additionally, platform fees raise the cost for users. These are fees imposed by the platform for hosting and administering campaigns, which cover operational costs and profit margin. Together, these fees can drastically limit the net cash available to campaigners, raising the platform's cost for users.

4. **Limited Accessibility:** Limited accessibility on centralized systems is a thoughtful concern for a variety of motives. Geographic limits are a major barrier, as some platforms are only available in certain countries, prohibiting worldwide users from accessing or engaging in the services. This restriction may limit the platform's reach and capacity to support a varied user base. Additionally, payment method restrictions limit accessibility. Many platforms exclusively accept credit cards or certain payment processors, excluding potential contributors who utilize other payment methods. This lack of payment flexibility may alienate users who prefer or are confined to other modes of payment, lowering the platform's overall participation and efficiency.

2.2.2 PROPOSED SYSTEM

The projected system leverages blockchain technology to make a decentralized crowdfunding platform. This system addresses countless limitations of traditional platforms by providing enhanced security, transparency, and efficiency.

- **Decentralized Control:** Decentralized control on a platform includes several critical aspects that improve security and transparency. Blockchain storage ensures that all transaction records, user contributions, and campaign information are saved on the blockchain. This decentralized technique ensures data integrity and immutability, as information cannot be changed once recorded, preventing tampering and fraud. Furthermore, smart contracts contribute significantly to decentralization by automating the release of cash in response to predetermined criteria. These self-executing contracts eliminate the necessity for a central authority, guaranteeing that funds are exclusively spent for their planned purpose and giving consumers with greater confidence and accountability. Together, blockchain storage and smart contracts enable a safer and more transparent environment, mitigating the dangers associated with centralized control.

- **Enhanced Security:** Several essential elements contribute to increased security in a decentralized platform. Data security is considerably enhanced by the use of decentralized storage and cryptographic mechanisms, which safeguard user data and transaction records from unauthorized access and cyberattacks. This guarantees that complex information is kept safe and secure. Additionally, the concept of immutable records strengthens security. Once data has been logged on the blockchain, it cannot be changed or removed. This immutability significantly minimizes the danger of fraud and tampering, as any attempt to change the records is easily identifiable. These elements work together to certify that user data and transaction records are secure and trustworthy, which improves the platform's overall reliability and integrity.

- **Lower Fees:** Lower fees are a significant benefit of decentralized networks, which derive from two primary sources. Reduced transaction costs are a significant benefit, as blockchain transactions typically incur cheaper fees than traditional payment processors. This is owed to the absence of intermediaries and the efficiency with which blockchain technology processes transactions. There are no platform fees, which further reduces expenditures. The platform's decentralized design eliminates the need for intermediate services, which normally charge for hosting and managing campaigns. As a result, fundraising becomes more affordable for users, allowing a larger part of cash earned to go directly to the intended projects and activities. Together, these reasons make decentralized platforms a more cost-effective option for campaign creators and backers.

- **Increased Transparency:** Increased openness is a significant advantage of decentralized networks, which is caused by two key elements. Public ledger expertise certifies that all communications are recorded on a publicly accessible blockchain, allowing anybody to check a flow of funds and the status of campaigns. This transparency fosters confidence among users by allowing them to independently confirm the integrity and progress of fundraising activities. Using smart contracts also improves auditability. These self-executing contracts establish a clear and verifiable

system for releasing cash only when campaign objectives are accomplished. This implies that both contributors and campaign designers can be confident that the fundraising rules are followed without having to rely on a central authority.

- **Greater Accessibility:** Greater accessibility is a primary advantage of decentralized networks, which is fueled by two major aspects. Global reach is a significant advantage, as the platform can be accessed from anyplace in the world, allowing for a diversified and broad user base with no geographical limits. This global accessibility enables campaign creators to reach a larger audience while allowing backers to support projects from any place. Furthermore, bitcoin support improves accessibility by allowing contributions in many cryptocurrencies. This flexibility gives backers additional options, accommodates varied tastes, and lowers entrance hurdles, particularly in places where traditional financial systems are less developed. Together, these traits ensure that decentralized platforms are inclusive and accessible to a wider spectrum of users, resulting in a more integrated and participatory environment.

COMPARISON TABLE

Table 2.2-Comparison Table

Feature	**Existing System**	**Proposed System**
Control	Centralized	Decentralized
Data Storage	Centralized Databases	Blockchain
Transaction Processing	Traditional Payment Gateways	Smart Contracts
Security	Vulnerable to Breaches	Enhanced Security with Blockchain
Transparency	Limited, Trust-Based	High, Verifiable on Public Ledger
Fees	High Payment and Platform Fees	Lower Transaction Fees, No Platform Fees
Accessibility	Region-Specific, Limited Payment Methods	Global, Multiple Cryptocurrencies
Fraud Risk	Higher, Trust-Based	Lower, Immutable and Transparent
Fund Release	Manual, Centralized Control	Automated, Controlled by Smart Contracts
User Trust	Based on Platform Reputation	Based on Transparent

Feature	Existing System	Proposed System
		Blockchain

2.2 FEASIBILITY STUDY

- **Technical Feasibility:** A variety of elements contribute to the proposed platform's technical feasibility. First, the application will be constructed with ReactJS, a popular and powerful JavaScript toolkit for creating user interfaces. This option assures that the platform is interoperable with any web browser, giving consumers flexibility and accessibility across several devices and operating systems. Second, the platform will require internet access, which is a common requirement for web-based apps to ensure real-time access and updates. Finally, users will require the 'Metamask' browser extension to sign transactions. Metamask is commonly used for communicating with blockchain applications, making it a dependable and safe solution for managing cryptocurrency transactions. Together, these aspects demonstrate that the platform is technically possible and can be implemented with well-established technologies and processes.

- **Social Feasibility:** Crowdfunding over the years has helped people but has also seen heavy frauds in the name of Crowdfunding. With Betterfund we want to bring transparency to the process of crowdfunding and build trust among people to contribute to all the causes.

- **Economic Feasibility**: Several significant variables contribute to the proposed platform's high economic feasibility. The Ethereum Blockchain's inherent powerful security features drastically minimize development expenses. This reduces the need for considerable investment in security infrastructure, as the blockchain's built-in processes assure data integrity and transaction security. As a result, the primary expense will be the server costs associated with deploying and maintaining the application. This cost is relatively modest compared to typical centralized platforms that need major investment in security, database management, and payment processing infrastructure. As a result, using the Ethereum Blockchain improves safety but also makes the platform more economically viable by lowering development and operating costs.

2.3 TOOLS AND TECHNOLOGIES USED

2.3.1 Frontend Technologies:

ReactJS: ReactJS is a leading JavaScript library known for building dynamic and responsive user interfaces. It will play a vital role in the platform by enabling the growth of interactive, single-page applications that facilitate user interactions such as campaign creation and contributions. This ensures a smooth and engaging user experience. Additionally, TailwindCSS will be utilized, a utility-first CSS framework that allows for the rapid creation of custom designs directly in HTML. TailwindCSS will be instrumental in designing a modern, responsive, and consistent user interface with minimal custom CSS, ensuring that the platform is visually appealing and easy to navigate. Together, these technologies will provide a robust and user-friendly environment for the platform's users.

Blockchain Integration

MetaMask and Thirdweb facilitate blockchain integration of platform. MetaMask is a commonly used cryptocurrency wallet that permits users to manage digital assets and securely store private keys. It connects user wallets to the platform, assuring secure transactions and contributions while also enabling smooth interaction with blockchain smart contracts. Thirdweb makes it easier to create and deploy blockchain applications by offering user-friendly SDKs, smart contract management tools, and blockchain activity statistics. MetaMask and Thirdweb work together to guarantee the platform's blockchain features are integrated efficiently, securely, and effectively.

- **MetaMask** is a widely-used cryptocurrency wallet that facilitates interaction with Ethereum-based applications. It features a user-friendly interface for managing digital assets and securely storing private keys. MetaMask is essential for connecting user wallets to the platform, enabling secure transactions and contributions. It also facilitates interaction with blockchain smart contracts, ensuring seamless integration with decentralized applications (DApps).
- **Thirdweb** is a development platform designed to simplify the creation and deployment of blockchain applications. It offers user-friendly SDKs for blockchain integration, tools for deploying and managing smart contracts, and analytics and monitoring capabilities for blockchain applications. Thirdweb will play a crucial role by simplifying blockchain functionalities such as smart contract deployment and

management. Additionally, it will provide essential development and monitoring tools for on-chain activities, ensuring efficient and effective blockchain integration.

3 SOFTWARE REQUIREMENT SPECIFICATION (SRS)

The blockchain-based crowdfunding platform will support two categories of users: campaign creators and backers. Campaign creators can launch and manage campaigns, establish funding targets, and notify supporters, while backers can explore and contribute to projects using a variety of cryptocurrencies. The platform will ensure transparency and security by documenting all transactions on the blockchain and using smart contracts to release funds only when specific goal line is accomplished. Comprehensive campaign management capabilities, sophisticated search and filter options, and a secure, scalable, and user-friendly interface are among the standout features. Furthermore, the platform will prioritize excellent performance, reliability, interoperability, and maintainability, delivering a smooth experience for all users.

3.1 USERS

The crowdfunding platform using blockchain will have the following types of users:

3.1.1 Campaign Creators: Individuals or groups that use the crowdfunding platform to raise donations for various projects or causes are known as campaign creators. Their tasks include planning and managing campaigns, establishing financial targets, communicating campaign progress, and actively connecting with backers to gain support. Campaign creators have the ability to launch new campaigns, manage campaign details, contact directly with backers to answer questions or offer updates, and withdraw funds after their funding goals are fulfilled. This job enables creators to efficiently promote their efforts and manage money donations transparently.

3.1.2 Backers: Backers: Individuals or companies who participate in the platform's backer program contribute monies to support creator campaigns. Their tasks include viewing available campaigns, contributing to projects that match with their interests or principles, and monitoring the success of campaigns they have supported. Backers can browse and search for campaigns based on specific categories or keywords, make direct contributions to campaigns, and view their contribution history for monitoring reasons. This job enables backers to participate in a range of initiatives, giving to causes they believe in while measuring the impact of their contributions.

These user roles are intended to encourage a collaborative and transparent environment in which campaign creators can effectively collect funds and manage projects, and backers may discover worthwhile efforts.

3.2 FUNCTIONAL REQUIREMENT

3.2.1 Campaign Management:

Campaign management on the platform provides campaign creators with vital tools for effectively promoting and overseeing their projects. Creators can launch new campaigns, setting specified funding goals and timeframes to meet their objectives, as well as providing thorough explanations of their initiatives' goals and impact. Multimedia support, like as photographs and videos, increases campaign visibility and engagement, allowing creators to clearly present their initiatives to potential backers. Furthermore, creators can update campaign progress in real time, keeping backers informed with regular updates on milestones reached or new developments, encouraging transparency and confidence throughout the fundraising cycle. These functionalities allow campaign creators to actively engage with their audience, optimize campaign performance, and increase their chances of meeting fundraising targets.

3.2.2 Contribution Mechanism:

For backers taking part in campaigns, the platform's contribution method guarantees security and flexibility. Backers can make contributions using multiple cryptocurrencies, giving them a variety of ways to support schemes that match their interests and digital assets. The platform is more accessible and can meet the varying tastes of backers thanks to its support for several cryptocurrencies. Putting smart contracts into practice is essential to guaranteeing the safety and reliability of transactions. The purpose of these self-executing contracts is to protect backers' contributions and align incentives for a successful project completion by automatically releasing funds to campaign creators only when predetermined funding goals are attained. When combined, these capabilities provide a safe and easy way for users to make contributions, improving the platform's overall openness and dependability for crowdsourcing.

3.2.3 Transaction Management:

The platform's transaction management is designed with user accessibility, openness, and dispute resolution as top priorities. The technology guarantees a high degree of transparency by logging every transaction on the blockchain, enabling any user to track and confirm the safe

and unchangeable flow of money. Viewing their whole transaction history gives users a thorough understanding of their financial dealings with the platform. A strong dispute resolution process is put in place to handle such conflicts. This method gives users a way to resolve disputes or inconsistencies and is essential for managing any transaction-related problems in an efficient and equitable manner. When taken as a whole, these characteristics boost user confidence, simplify financial procedures, and preserve a reliable atmosphere for doing business on the crowdfunding platform.

3.2.4 Search and Filter:

Robust search and filtering features are integrated into the platform to improve user experience and enable effective campaign discovery. By employing keywords to search for campaigns, users can find initiatives that rapidly match their interests or particular requirements. By allowing users to filter campaigns based on categories like social issues, creative projects, or technical initiatives, filters are implemented to further limit search results. Furthermore, financing status filters shed light on initiatives that are running, succeeding, or have ended, while popularity filters draw attention to projects that are trending or have received a lot of support. With the help of these search and filtering features, consumers can efficiently examine a wide variety of campaigns and decide where on the platform to focus their support.

3.3 NON-FUNCTIONAL REQUIREMENT

• Security:

- Ensure the platform is secure against cyberattacks.
- Implement data encoding for sensitive information.
- Regular security audits and vulnerability assessments.

• Scalability:

- the platform should be able to handle a large number of users and transactions.
- Implement load balancing and scalable infrastructure.

• Performance:

- The platform should have minimal latency for transaction processing.
- Ensure fast loading of web pages and responsive user interface.

• Usability:

- The platform should have an intuitive and user-friendly interface.
- Provide clear instructions and help documentation for users.

• Reliability:

- Ensure high accessibility with minimal downtime.
- Implement backup and disaster recovery mechanisms.

• Interoperability:

- The platform should be well-suited with various web browsers and devices.
- Ensure integration with popular cryptocurrency wallets.

• Maintainability:

- The platform should be easy to maintain and update.
- Provide comprehensive documentation for developers.

• Transparency:

- Ensure all transactions and campaign activities are transparent and verifiable on the blockchain.
- Provide access to audit logs and transaction records for users and auditors.

4 SYSTEM DESIGN

4.1 SYSTEM PERSPECTIVE

The blockchain-based crowdfunding platform will run as a decentralized application (DApp), relying on blockchain technology to enable secure, transparent, and immutable transaction processing. It will have various integrated components aimed at providing a consistent user experience while adhering to strict security standards and maintaining data integrity. The user interface (UI) will be a web-based front-end that allows users to interact with the platform in a simple manner, with responsive design to ensure accessibility across several devices such as PCs, tablets, and mobile phones.

The blockchain layer, which is most likely based on Ethereum or another compatible network, will manage all transactions securely. Smart contracts will play an important role in managing crowdfunding campaigns, contributions, and fund releases, as well as enforcing set rules and maintaining transaction integrity. An application server will handle backend logic, such as processing user requests, interacting with the blockchain layer, and executing business logic using RESTful APIs that allows to communicate between front-end and blockchain components. Integration with cryptocurrency wallets via a payment gateway will allow backers to make contributions in several cryptocurrencies, including Bitcoin and Ethereum, increasing flexibility and accessibility. Furthermore, a notification service will give users with real-time updates on campaign progress, contributions, and other important events, ensuring timely interaction and transparency throughout the crowdfunding process.

4.2 CONTEXT DIAGRAM

The context diagram provides a high-level opinion of the system, showing its interactions with exterior entities and components. It identifies the main users and their interactions with the system components.

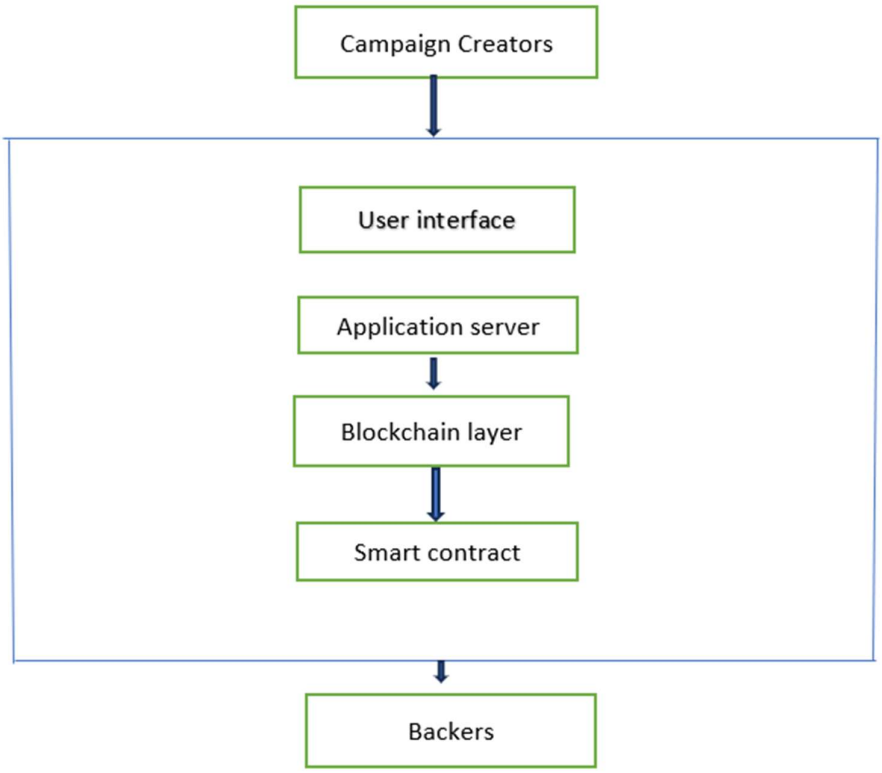

Fig-4.2 context diagram

Campaign Creators engage with the User Interface to initiate and oversee campaigns, managing details such as funding goals and updates throughout the campaign lifecycle. Backers utilize the User Interface to explore available campaigns and make contributions based on their interests and preferences. The User Interface facilitates these interactions by transmitting user requests to the Application Server, which handles backend operations and interfaces with the Blockchain Layer. Here, transactions are managed securely via Smart Contracts, ensuring adherence to predefined rules and conditions. The Blockchain Layer plays a crucial role in guaranteeing the security, transparency, and immutability of all transactions, leveraging its decentralized nature for enhanced reliability. Real-time updates on campaign progress and contributions are facilitated by the Notification Service, keeping users informed promptly. Meanwhile, the Payment Gateway integrates seamlessly with cryptocurrency wallets, enabling backers to contribute using various cryptocurrencies like Bitcoin and Ethereum, thus promoting accessibility and flexibility within the platform.

5 IMPLEMENTATION (CODE SNIPPETS)

Code: Crowdfunding.sol

```
// SPDX-License-Identifier: UNLICENSED
pragma solidity ^0.8.9;

contract CrowdFunding {
   struct Campaign {
      address owner;
      string title;
      string description;
      uint256 target;
      uint256 deadline;
      uint256 amountCollected;
      string image;
      address [] donators;
      uint256[] donations;
   }

   mapping (uint256 => Campaign) public campaigns;

   uint256 public numberOfCampaigns = 0;

   function createCampaign (address _owner, string memory _title, string memory
    _description, uint256 _target, uint256 _deadline, string memory _image) public returns
    (uint256) {
      Campaign storage campaign = campaigns[numberOfCampaigns];
      require (campaign. deadline < block. timestamp, "The deadline should be a date in the
    future.");
      campaign.owner = _owner;
      campaign.title = _title;
      campaign.description = _description;
      campaign.target = _target;
```

```
        campaign.deadline = _deadline;
        campaign.amountCollected = 0;
        campaign.image = _image;
        numberOfCampaigns++;
        return numberOfCampaigns - 1;
    }

    function donateToCampaign(uint256 _id) public payable {
        uint256 amount = msg.value;
        Campaign storage campaign = campaigns[_id];
        campaign.donators.push(msg.sender);
        campaign.donations.push(amount);
        (bool sent,) = payable(campaign.owner).call{value: amount}("");
        if(sent) {
            campaign.amountCollected = campaign.amountCollected + amount;
        }
    }

    function getDonators(uint256 _id) view public returns (address[] memory, uint256[]
     memory) {
        return (campaigns[_id].donators, campaigns[_id].donations);
    }

    function getCampaigns() public view returns (Campaign[] memory) {
        Campaign[] memory allCampaigns = new Campaign[](numberOfCampaigns);

        for(uint i = 0; i < numberOfCampaigns; i++) {
            Campaign storage item = campaigns[i];

            allCampaigns[i] = item;
        }
        return allCampaigns;
    }
     }
```

App.jsx:

```
import React from 'react';
import { Route, Routes } from 'react-router-dom';

import { Sidebar, Navbar } from './components';
import { CampaignDetails, CreateCampaign, Home, Profile } from './pages';

const App = () => {
  return (
    <div className="relative sm:-8 p-4 bg-black min-h-screen flex flex-row">
      <div className="sm:flex hidden mr-10 relative">
        <Sidebar />
      </div>

      <div className="flex-1 max-sm:w-full max-w-[1280px] mx-auto sm:pr-5">
        <Navbar />

        <Routes>
          <Route path="/" element={<Home />} />
          <Route path="/profile" element={<Profile />} />
          <Route path="/create-campaign" element={<CreateCampaign />} />
          <Route path="/campaign-details/:id" element={<CampaignDetails />} />
        </Routes>
      </div>
    </div>
  )
}
export default App
```

5.1 Screenshots:

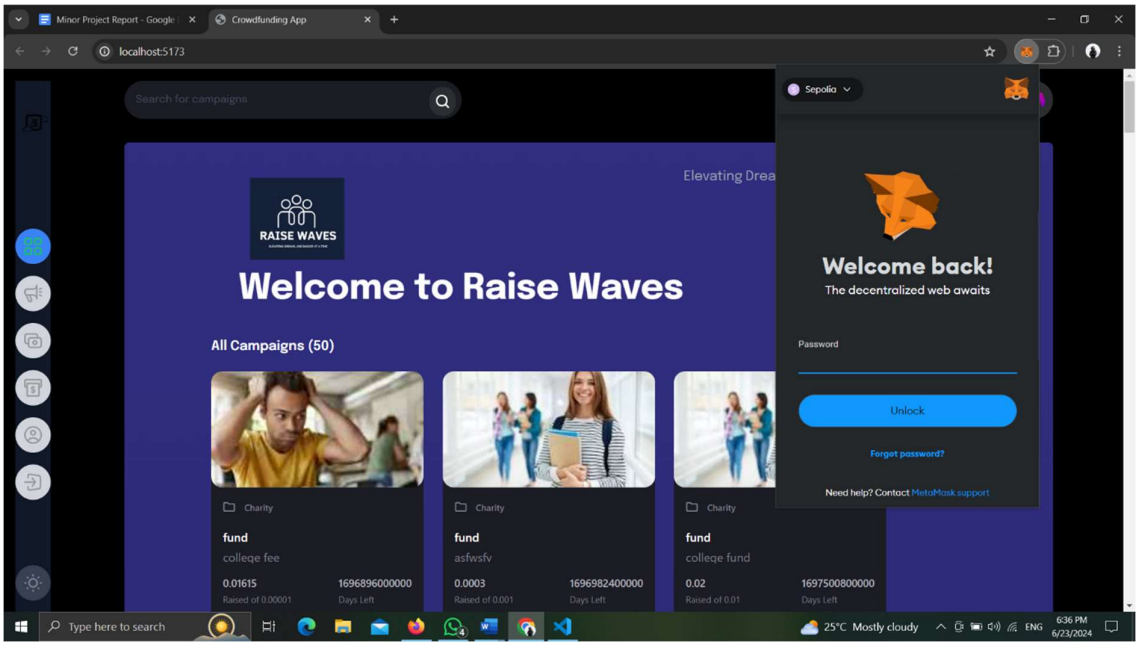

Fig-5.1.1 MetaMask connection

In the above fig-5.1.1 we are connection crypto wallet i.e metamask to our website where user can contribute to the ongoing crowdfunding campaign

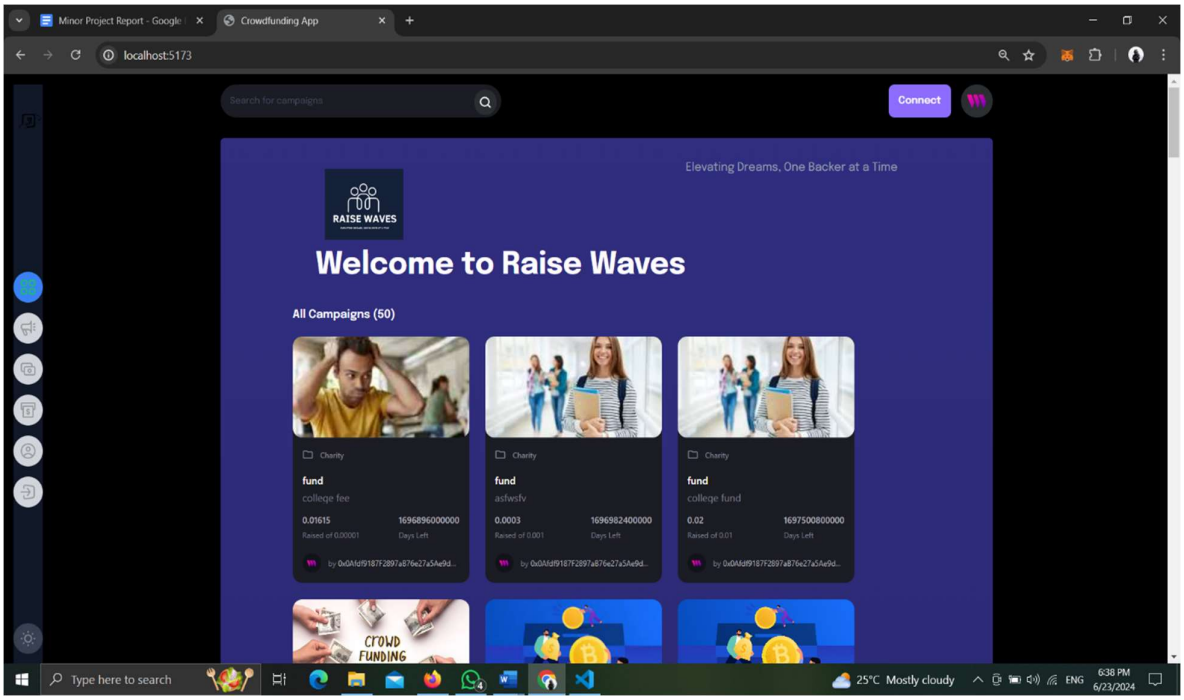

Fig-5.1.2 Dashboard

The above fig-5.1.2 is the home page or dashboard where we are going to get all the campaign which can later used by the user to contribute to the crowdfunding campaign.

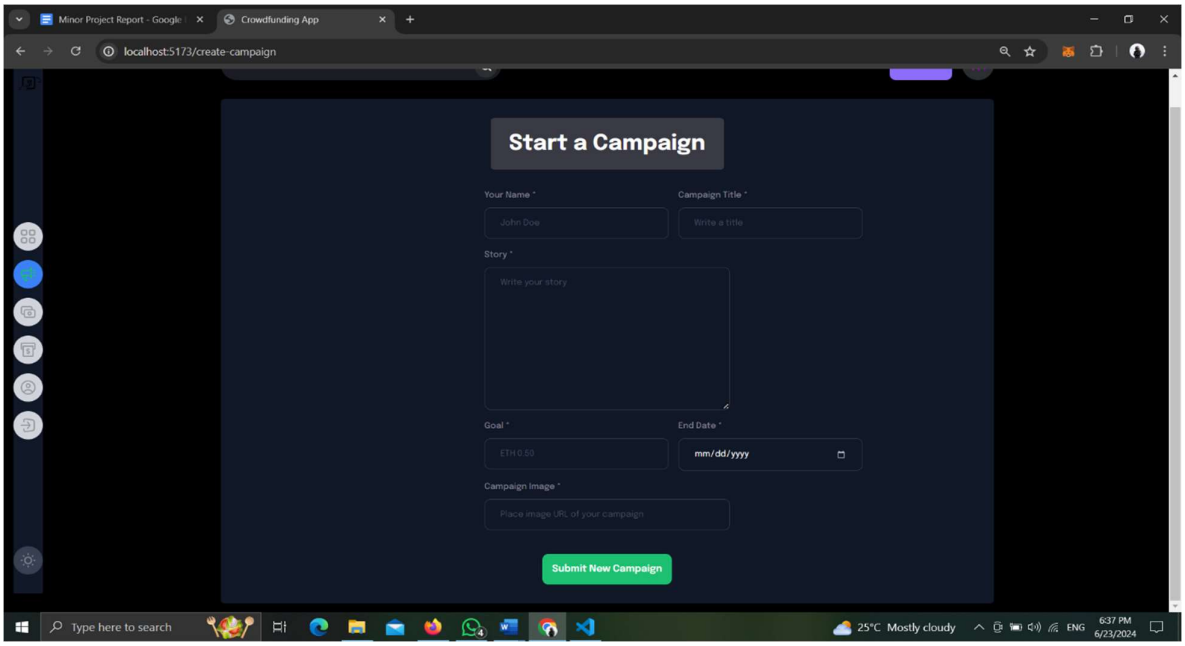

Fig-5.1.3 Create campaign page

In the above fig-5.1.3 the user can can create a campaign by giving his name, title, story of the campaign for what he is collecting funds, end date of the campaign, goal of the campaign and image URL for displaying it on the dashboard.

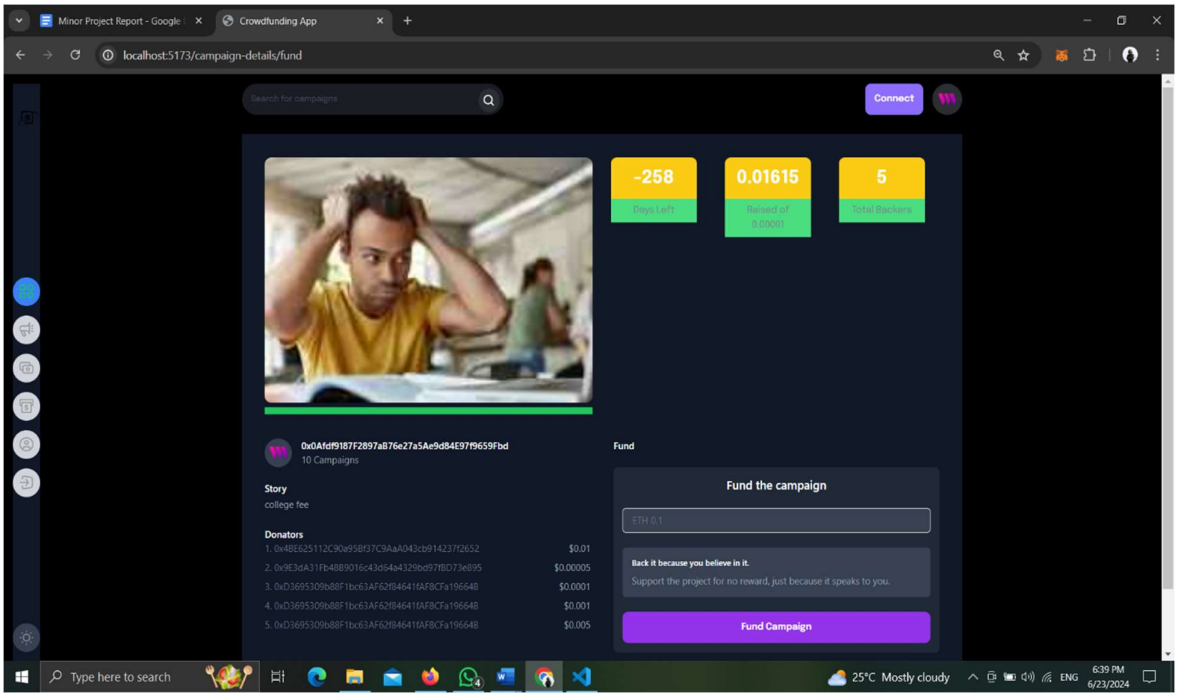

Fig-5.1.4 Campaign Page

The above fig-5.1.4 is the campaign page where user can contribute to the specific campaign by selecting the particular campaign. After selecting the specific campaign this page appears where user get information of total number of people contributed and total amount that is been raised.

6 CONCLUSION

Conventional crowdfunding methods have long suffered from nonexistence of transparency and fraud. It is an avoidable problem, and it is been implemented a solid solution that can do away with these long-standing problems.

The aim to have a transparent, anti-fraudulent, decentralized platform has been achieved to a great extent. This project has covered the weak points of general crowdfunding platforms to provide transparency to the process of crowdfunding and build trust among people, so that they may donate their wealth to good causes without fear of fraud.

7 FUTURE ENHANCEMENT

- **Integration of Additional Blockchains:** The integration of additional blockchains such as Binance Smart Chain, Polkadot, and Solana broadens the platform's transaction choices. This enables customers to benefit from potentially lower fees and more interoperability. The upgrade seeks to provide a more versatile and user-friendly platform, catering to various blockchain tastes and requirements.

- **Enhanced User Experience (UX):** By taking user response into account and implementing the newest design trends, enhanced user experience refers to the ongoing improvement of the user interface and overall user experience. By enhancing user engagement and satisfaction, this strategy hopes to boost conversion rates and platform utilisation. The platform becomes more intuitive and appealing by emphasising user-centric design and usability, which encourages more frequent and sustained user interactions.

- **AI and Machine Learning Integration:** Predictive analytics, personalised advertising recommendations, and fraud detection are just a few of the jobs that will be handled by AI and machine learning. By spotting and stopping questionable activity, this integration improves security and makes the user experience safer. Furthermore, it enhances the user experience by providing personalised insights and information, which makes the platform more interesting and pertinent to each user's requirements and tastes.

- **Mobile Application Development:** In order to enhance the current web platform, mobile development will concentrate on producing native applications for both iOS and Android. By enabling users to manage their campaigns and contributions from anywhere at any time, this method improves accessibility and convenience. The platform becomes more adaptable and user-friendly by providing a mobile-friendly experience, satisfying the increasing need for mobile device usage.

- **Crowdfunding Campaign Analytics:** Providing comprehensive analytics and reporting tools to campaign creators is a key component of crowdfunding campaign analytics. With the aid of these technologies, designers will be able to monitor the

success of their campaigns and adjust their tactics in light of new information. Campaign designers can increase their chances of success by using data to inform their decisions. This is because they will be better able to determine what aspects of their campaigns are effective and which ones require modification.

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