



BLOCKCHAIN BASED DECENTRALISED TWEET APP

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Abstract : We propose an innovative approach for decentralized data storage and access in social media applications using blockchain technology. Specifically, we focus on developing a blockchain-based Twitter clone that eliminates the reliance on centralized repositories. Our solution utilizes public blockchain networks, including Goerli Testnet, and leverages tools such as Metamask, Hardhat and Ethereum IDE for contract deployment. We also discuss the potential benefits and challenges associated with blockchain-based data storage and access and explore future research directions in this field. Our proposed solution represents a significant step towards more secure, transparent, and decentralized social media applications. Our proposed solution represents a significant step towards more secure, transparent, and decentralized social media applications. By utilizing blockchain technology, we offer a novel approach to data storage and access that mitigates the risks associated with centralized repositories. This paper provides a valuable contribution to the field of blockchain-based social media applications, and we believe that our proposed solution has the potential to revolutionize the way we interact with social media platforms.

Keywords - Public blockchain, Decentralized system, Hardhat, Goerli Testnet, Alchemy, Twitter

I. INTRODUCTION

Social media platforms have become an essential part of our daily lives, providing us with a platform to express our thoughts, ideas, and opinions. However, traditional social media platforms rely on centralized repositories to store and access data, which raises concerns regarding data privacy, security, and ownership. Blockchain technology has arisen in recent years as a viable remedy for these problems, offering decentralised storage, safe data exchange, and effective lookup capabilities. On the other side, blockchain technology offers a decentralised and secure platform for data access and storage, doing away with the requirement for a centralised authority. In this paper, we suggest a Twitter clone based on blockchain that utilizes public blockchain networks, smart contracts, and decentralized storage to provide users with greater control over their data.

The proposed solution not only addresses the issues associated with centralized data storage, but also enables efficient data sharing, distributed processing, and enhanced privacy. This paper explores the technical aspects of our solution, including contract deployment, metadata storage, and transaction management. Overall, this research paper presents a innovative approach to decentralized data storage and access in social media applications using blockchain technology. The proposed solution provides users with a secure, transparent, and efficient platform to express themselves and interact with others, while maintaining their data privacy and ownership.

II. LITERATURE REVIEW

V. Deepika et. al. [1], presents a study on the design and implementation of a blockchain-based Twitter clone to achieve a decentralized and secure platform for social media data storage and access. The paper provides a thorough review of related work and proposes a solution that utilizes various blockchain tools and technologies. The solution presented showcases encouraging outcomes and offers valuable insights into the advantages and obstacles of employing blockchain technology in social media applications.

The blog post by Moralis (2021) , provides a practical guide on how to build a Web3 Twitter clone using blockchain technology. It highlights the benefits of blockchain technology for social media applications but does not present a comprehensive study on the design and implementation of a blockchain-based Twitter clone or provide an evaluation of its performance. Other studies, such as Gupta and Singh (2020), have explored the technical aspects of blockchain-based social media platforms in greater detail, proposing solutions that utilize public blockchain networks, smart contracts, and decentralized storage, and discussing potential applications of blockchain-based social media platforms in various industries.[2]

The article offers a thorough analysis of blockchain technology and how it can change many sectors. It analyses the various blockchain networks and consensus processes in use, as well as the fundamental ideas behind blockchain technology. Using examples from the real world, the article explores how blockchain technology is being used in fields like voting systems, supply chain management, healthcare, and cryptocurrencies [7]. The authors address potential future developments, including the incorporation of artificial intelligence and the advent of decentralised finance, as well as the limitations of blockchain technology. Overall, the paper offers a thorough analysis of blockchain technology and its ability to completely change a number of industries.[3]

In[4], the authors provide an overview of blockchain technology and its potential to revolutionize various industries such as finance, healthcare, and supply chain management. They discuss the basic architecture of blockchain, including the roles of nodes, miners, and the blockchain ledger. Moreover, the authors deliberate on the advantages and disadvantages of various consensus mechanisms such as Proof of Work (PoW), Proof of Stake (PoS), and Delegated Proof of Stake (DPoS)[8]. Finally, the authors discuss the future works in blockchain technology, including the adoption of blockchain in Internet of Things (IoT) applications, and the development of new consensus mechanisms. Also the various applications of blockchain technology in healthcare. They provide an overview of the current challenges faced by the health industry, such as interoperability, privacy, and security, and how blockchain can address these challenges[10]. The authors also highlight several blockchain-based healthcare applications, such as electronic health records, clinical trials, and drug supply chain management. They go over how blockchain can be used to address issues like supply chain transparency, traceability, and trust. The authors also highlight several blockchain-based supply chain applications, such as provenance tracking, inventory management, and product authentication. They provide an overview of the current challenges faced by the financial industry, such as the high cost of intermediation and the slow settlement times, and how blockchain can address these challenges. The authors also highlight several blockchain-based financial applications, such as cross-border payments, trade finance, and securities settlement. They discuss various research directions such as scalability, privacy, and security, and the challenges associated with each of them. The authors also stress the value of interdisciplinary blockchain technology research, which includes disciplines including computer science, economics, and law[10]. These publications offer a thorough introduction to blockchain technology, including an analysis of its architecture, consensus mechanisms, and prospective applications across several sectors [13]. They also emphasise the difficulties and potential avenues for future study in blockchain technology.

To identify the most significant applications and use cases, the study conducts a comprehensive evaluation of the literature concerning the utilization of blockchain technology in social media. It highlights the potential of blockchain to address challenges related to data privacy, content ownership, and trust in social media [11]. The paper discusses the technical aspects of blockchain and the importance of scalability, interoperability, and usability in blockchain-based social media systems. Overall, the paper provides valuable insights into the current state of research on the use of blockchain in social media and identifies important research directions and challenges for future work in this area.[5]

According to a CoinDesk article, South Korean messaging giant Kakao has started developing its own blockchain platform dubbed Klaytn. A testnet of Klaytn, Kakao's division for blockchain development, has been made available for decentralized applications (DApps). The platform employs a hybrid strategy, with ranger nodes (RNs) double-checking the blocks transmitted by the consensus nodes (CNs) and consensus nodes (CNs) building a private blockchain to confirm transactions using a byzantine fault-tolerant (BFT) consensus process. With a throughput of up to 1,500 transactions per second and a block propagation interval of less than one per second, the network provides scalability and transparency. To encourage engagement, the network will distribute 10 billion KLAY tokens. The source code will be made available to the public, and 10 billion KLAY tokens will be distributed to encourage participation. The Klaytn full live network is anticipated to launch in Q1 2019.[6]

Blockchain can be used in government services such as voting, identity management, supply chain management, and property registration. Blockchain provides security benefits such as tamper-proof transactions, decentralization, and immutable data. Challenges associated with the implementation of blockchain technology in government services include scalability, interoperability, regulatory issues, and privacy concerns [12].

III. METHODOLOGY/EXPERIMENTAL

In this paper we proposed a decentralized twitter, which is more secured as compared to conventional twitter app. It's a decentralized web app which offers increased security and integrity. We have developed blockchain based system with framework react for frontend and used solidity for smart contract in backend. In this project our proposed application provides secured way to share tweets, basically these tweets are get stored on blockchain network. Only those who are permitted by Twitter can create accounts, send messages from one account to another, and add and remove tweets.

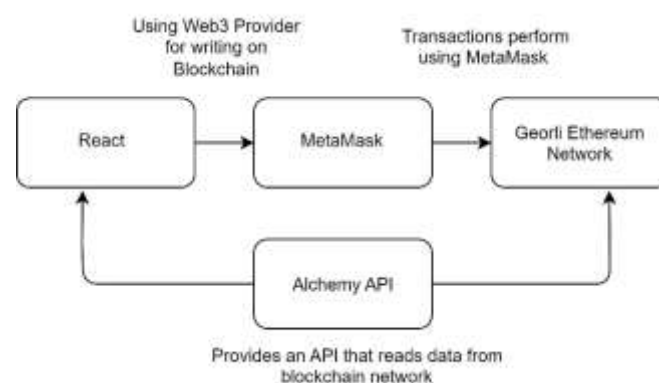


Fig. 1. Work flow of blockchain based tweet app

As shown in Figure 1, frontend of this application connected to Georli Ethereum network and metamask is used for authentication of user and to read data from blockchain network used alchemy API.

To authenticate users and perform any activity in the blockchain-based system, we used Metamask authentication, which also serves as a wallet. To develop the frontend of our application, we used React, a JavaScript library used to build interactive elements on websites. For the backend, we developed a smart contract using Remix IDE, which is a rich toolset that can be used by users of any knowledge level for experimenting with Ethereum. As seen in Figure 2, we used Hardhat to deploy our smart contract. This tool makes it simple to deploy contracts, perform tests, and debug Solidity code without having to deal with real environments. On

the Goerli Ethereum test network, our smart contract was put into operation via the Hardhat Network, a nearby Ethereum network created for development.

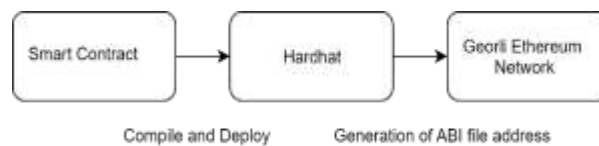


Fig. 2. Smart Contract deployment flow

Effective communication between the frontend and backend is crucial for any web3 application that needs to interact with the blockchain network. One of the key components that facilitate this communication is the Web3 Provider. After smart contract is deployed on a live chain, the Web3 Provider is required to retrieve data from the blockchain. Nodes play a critical role in the web3 developer stack, as web3 libraries cannot interact with smart contracts without them. The Web3 Provider serves as a mediator between the frontend and the node, taking JSON-RPC requests and returning the appropriate response. In essence, the Web3 Provider can be thought of as a website or server that runs a Geth or Parity node, enabling it to communicate with the Ethereum network on behalf of the web3 application. By utilizing a Web3 Provider, web3 developers can build powerful applications that interact seamlessly with the blockchain network.

We used Alchemy API to connect our smart contract to a specific network. Alchemy is the leading blockchain API that can be used on popular blockchains such as Ethereum or Polygon to perform common operations like consulting gas prices, getting blocks, and sending transactions. The Alchemy key serves as an authentication key and allows us to query the Alchemy API. Our proposed methodology provides increased security and integrity by utilizing blockchain technology and eliminates the need for centralized repositories.

IV. RESULTS AND DISCUSSIONS

After deploying the contract, it is necessary to execute it using a lite-server and setting the local host to 3000. Upon execution, the contract will activate, figure 3 shows opening a browser window for users to perform actions, such as opening a Twitter account, adding or deleting tweets, and sending messages between accounts. Every operation is processed only after successful transaction through metamask by spending some ethers as shown in Figure 4 and 5. These actions are facilitated by the contract, which enables users to interact with the Twitter platform in a decentralised and secure manner. The use of the lite-server ensures that the contract operates efficiently and with low latency, providing a seamless experience for users. Overall, this implementation demonstrates the power and potential of blockchain technology for building decentralized applications that enable secure and transparent interactions between users.



Fig. 3. Frontend of blockchain based tweet app

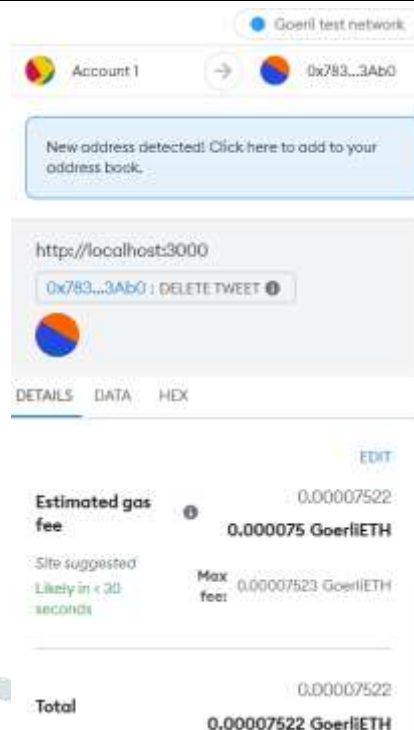


Fig. 4. Transaction of ethers on tweeting

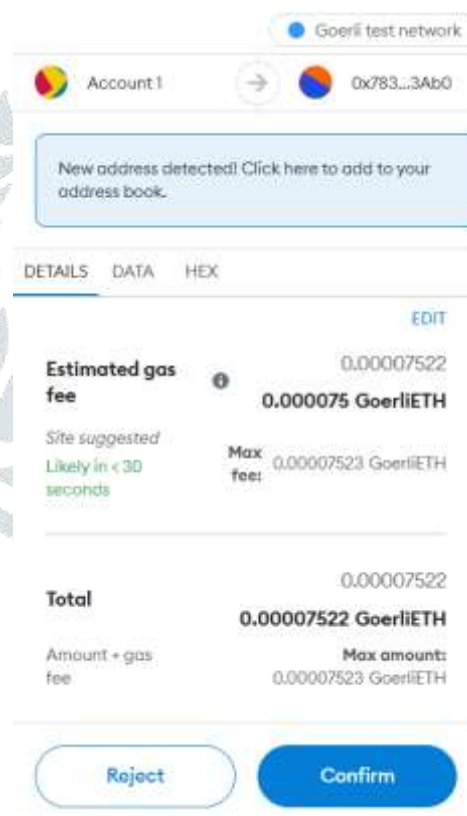


Fig. 5. Transaction conformation for tweet

V. CONCLUSION

Our proposed decentralized Twitter application utilizing blockchain technology represents a significant step towards more secure, transparent, and decentralized social media platforms. We do away with the necessity for centralized repositories and offer a more secure and open method of data access by utilising public blockchain networks and smart contracts. By automating social network transactions, our system also offers a more effective and streamlined customer experience. Future studies might examine the possible integration of decentralized blockchain technology with other social media sites, like Facebook, WhatsApp, and LinkedIn. This can help in improving the security and transparency of data storage and access in these platforms, addressing growing concerns over data privacy and security. Furthermore, this can contribute to the development of more efficient and streamlined user experiences, leveraging the benefits of smart contract automation.

Overall, our proposed solution demonstrates the potential of blockchain technology to revolutionize the way we interact with social media platforms, and we believe that our work contributes to the ongoing efforts to develop standardized protocols and frameworks for blockchain-based social media applications. We hope that our project inspires further research and development in this field, leading to more secure, transparent, and decentralized social media applications in the future.

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