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# Decentralized Social Media Using Ethereum Blockchain and Solidity Smart Contract

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**ABSTRACT:** Social media has been one of the most influential technologies in the past decade. It revolutionised the way people communicate with each other. The current major social media platforms use the Web 2.0 which was first introduced in 1999 which allows user to upload user generated content to a website. These social media websites offer services in exchange of user data which are later stored in the databases controlled by large centralized companies. The users are not even aware of and do not even have complete control over the data they share with the current social media platforms. This creates a huge privacy risk as well as cements the monopoly of the company. This project aims to dismantle the centralized power structures of Web 2.0 and offer a new level of control and ownership to individuals. A decentralized social media platform allows user to upload their content to the internet and let other people share their opinion on it without having to be concerned about the data getting leaked or sold as the data is not getting stored in any databases owned by any centralized company. Since the Web 3.0 is excellent at transaction of crypto currencies between two users which is known as DeFi, this feature can also be implemented into the social media as well. Which means not only Web 3.0 will make it possible to have user data safe but can also make safe and reliable payments through it. Since none of the data is getting stored in any databases the data of users cannot be sold to third party companies who later use these data for advertisements. This significantly decreases the cyber attacks as well because now the hackers will have to hack the entire blockchain to get the data of the users. Decentralized social media benefits the user more than the current system which benefits the platform or the company running it thus it is essential to implement it sooner than ever.

**KEYWORDS:** Blockchain, Privacy, Decentralized, Web 3.0.

## I. INTRODUCTION

The current landscape of social media is dominated by centralized platforms that control user data, algorithms, and content moderation. However, this model has raised concerns about data privacy, censorship, and lack of user control. In response, decentralized social media platforms utilize blockchain technology and decentralized networks to address these issues. Blockchain, the underlying technology of cryptocurrencies like Bitcoin, serves as a distributed ledger, enabling secure, transparent, and tamper-resistant record-keeping. Our platform operates on decentralized networks, ensuring that no single authority controls user data or platform governance. This fosters a more democratic and inclusive environment.

Navigating the Decentralized Social media website is designed to be intuitive and user-friendly, offering familiar social media functionalities while incorporating the benefits of decentralization. Users can create profiles, share content, engage in discussions, join interest-based communities, and curate their feeds based on personal preferences.

The current social media landscape is dominated by centralized platforms that have raised concerns about data privacy, algorithmic bias, and censorship. Decentralized social media platforms (DSMPs) built on blockchain technology offer a promising alternative by empowering users and democratizing online communication.

Paper is organized as follows. Section II describes the proposed system and what it intends to do. The flow diagram represents the steps of the algorithm and how this system can be implemented which is described in Section III. Section presents the system design and the components of the project. Section V presents the experimental results and what the current project has to offer. Section VI is the conclusion.

## II. PROPOSED SYSTEM

Decentralized social media websites offer several advantages over their centralized counterparts: Enhanced Data Privacy and Security: Decentralized platforms distribute data across a network of nodes rather than storing it in a central server. This reduces the risk of large-scale data breaches and unauthorized access since there's no single point of vulnerability, giving users greater control over their data. User Ownership of Data: Users on decentralized platforms often have ownership and control over their data. This ownership empowers individuals to decide how their information is shared, stored, and utilized, promoting greater transparency and user autonomy. Reduced Dependence on Intermediaries: Decentralized platforms reduce reliance on centralized intermediaries, fostering direct peer-to-peer interactions. This eliminates the need for a central authority to control or mediate user interactions, allowing for more direct and democratic governance models. The proposed system is more resistant to censorship and content control. Since there's no central authority to dictate content moderation policies, these platforms are less prone to bias, censorship, or arbitrary removal of content based on centralized decision-making. Which means no matter how political or controversial the post or content is, no company or government can manipulate it or get it removed from the platform. All accounts created in the platform are created using crypto wallets such as Metamask which lets users to make transactions to each other just like they do with the traditional banking system but using blockchain. Content creators can get monetized using this system and can also sell their NFTs.

## III. METHODOLOGY

The system contains a login system which is different to the current system of login system which uses user's data such as email id and phone number. Instead of using email to login this project uses crypto wallets which use to verify the user details as crypto wallets acts as an unique id for each individuals. This also ensures the user their privacy as the platform does not ask their personal information such as email id or password or phone number which can cause major privacy risk. Every application developed on blockchain requires a smart contract. A smart contract contains information which makes the connection possible between the front end of the system to the blockchain. The smart contract contains the details such as the authentication details and the posts or contents of users which they post in the platform. The content posted in the platform gets uploaded as a transaction in the blockchain and the transaction history is recorded in the wallet by which the user posted the content. The content cannot be deleted by anyone other than the user himself and even if the post gets deleted from the platform, the transaction history cannot be deleted. Tipping feature can be implemented which will monetize the content shared in the platform where users can tip a particular post using their wallet and the user who posted content gets the amount directly without any paycuts from the platform itself.

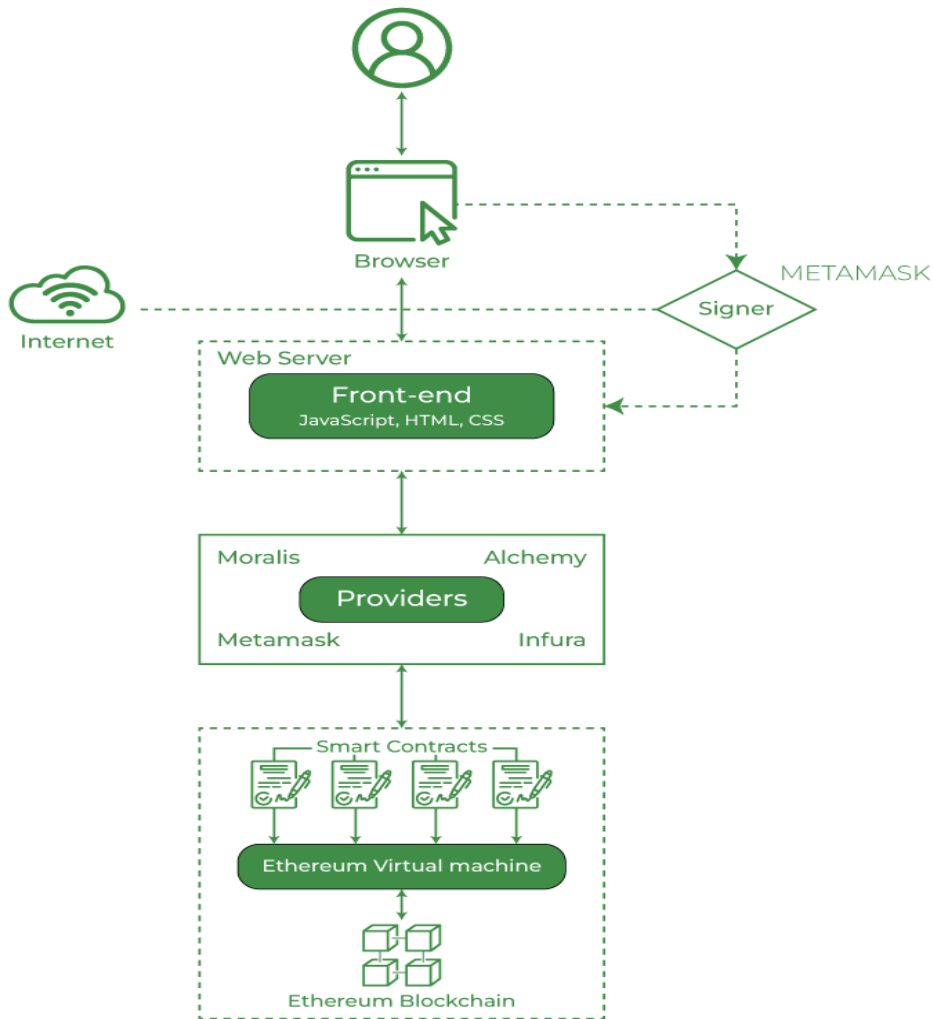


Fig. 1 Flow diagram of how the system works

#### IV. SYSTEM DESIGN

##### 1. Smart Contract

A Smart Contract is a self-executing piece of information in the form of code which is used to carry out actions such as transactions in the blockchain. In a decentralized social media application these smart contracts can be programmed to carry information such as login authentication, posts, tips, likes and comments etc. Once deployed on the blockchain, smart contracts do not require any third-party involvements to perform the tasks it is instructed with. In this project Solidity is used as the language in writing the smart contract which contains functions which are used to perform tasks such as posting and tipping.



```
function setBloc(string memory _Bloc) public {
    require(bytes(_Bloc).length <= MAX_CHARACTER_AMOUNT, "Bloc is too long");
    bytes32 uniqueId = keccak256(abi.encodePacked(block.timestamp, _Bloc, msg.sender));
    userBlocs[msg.sender].push(Bloc(_Bloc, msg.sender, block.timestamp, uniqueId));
    emit BlocUpdated(msg.sender, _Bloc, block.timestamp, uniqueId);
}
```

Fig 2 Smart contract function for posting in solidity language

### 2. User Interface

A key factor in the development of a social media platform is its user interface. The platform must have an easy to use and convenient user design where the user could easily understand the platform’s interface without having to rely on any help or explanation from a different source. React Js or Next Js can be used to develop the frontend of the platform as both these javascript libraries allows developers to create SPA(Single Page Application) which is well optimised and doesn’t reload every time an event occurs. Also these libraries help in creating cross platform applications simultaneously. The User Interface must contain a feed where all the posts will be seen and an account centre where all the posts from one particular account can be seen.

### 3. IPFS (InterPlanetary File System)

Unlike traditional file systems that rely on centralized servers, IPFS is decentralized. Files are distributed across multiple nodes in the network, reducing the reliance on any single point of failure. This decentralized storage can be used to store photos and videos from the decentralized social media platform. Once a file is added to IPFS and assigned a hash, it cannot be changed. Any change to the file would result in a new hash. This immutability ensures data integrity and prevents tampering.

## IV. EXPERIMENTAL RESULTS

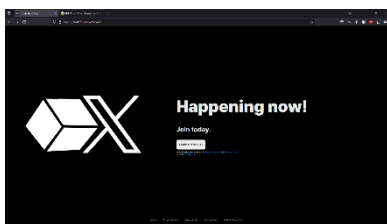


Fig 3 Landing Page

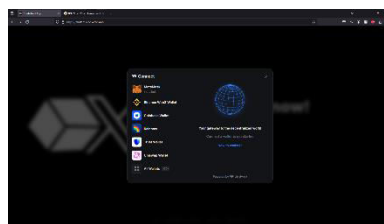


Fig 4 Login

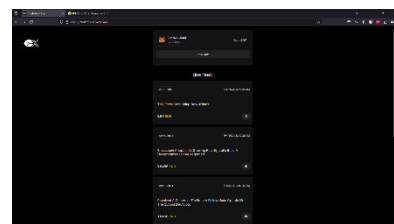


Fig 5 Feed

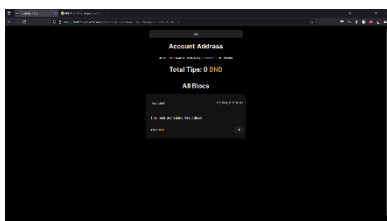


Fig 6 Account Centre

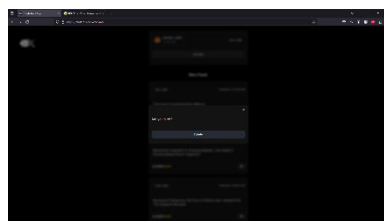


Fig 7 Deleting Post

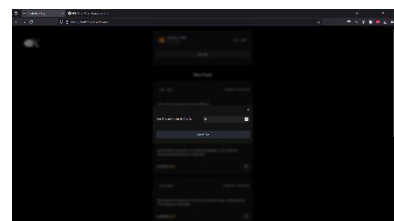


Fig 8 Tip

Fig 3 shows the landing page where the user gets the option to connect their crypto wallet which is shown in Fig 4 where 350+ crypto wallets are available to login using ThirdWeb API. Once login is successful user is welcomed with the feed as shown in Fig 5 where the user can upload their posts and share their thoughts without having to worry about their data getting compromised. Fig 6 shows the account center where a user can see all their posts and the amount of

tips they received. Fig 7 shows the option to delete the post for the user and only user who uploaded the post and owns the account can delete the post once posted on decentralized social media platform. If the user likes a particular post by some other user and wants to encourage them to post more such contents, they can tip them like shown in Fig 8.

## V. CONCLUSION

In conclusion, the vision of a decentralized social media website represents more than 5a technological innovation; it embodies a fundamental shift in how we connect, share, and interact in the digital sphere. Through the integration of decentralized principles, blockchain technology, and user-centric design, our project aims to redefine the landscape of social networking.

By prioritizing user privacy, data ownership, and fostering transparent, community-driven governance, our decentralized social media platform seeks to address the limitations and concerns inherent in centralized platforms. The vision extends beyond mere connectivity, striving to empower users with control over their online presence while promoting inclusivity, security, and authenticity in digital interactions.

As we navigate this transformative journey, we remain committed to developing a platform that not only revolutionizes social networking but also champions the values of decentralization, transparency, and user empowerment. Our project stands as a testament to the potential of decentralized technologies in reshaping the future of social media, fostering a more equitable, secure, and participatory online ecosystem for users worldwide.

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