IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 6, June 2022
Impact Factor: 6.252

Decentralized Social Media Platform using Blockchain

Manoj Kumar T[1], Mukunthan K[2], R. Reena[3], S. Bhuvaneswari[4]
Students, Department of Computer Science and Engineering[1]
Associate Professor, Department of Computer Science and Engineering[2,3]
Prince Shri Venkateshwara Padmavaathi Engineering College, Chennai, India

Abstract: *In today's technologically driven world, social media has become an increasingly important part of our daily lives. It lets people interact with one another over the internet, which makes communication much easier. All of these advantages, however, appear to be too good to be true. However, all of these features and services come at the cost of our privacy. They monitor our daily activities on these platforms in order to provide targeted advertising and generate revenue. To overcome this problem, we suggest utilizing blockchain technology to build a completely decentralized social media platform in which no single organization or individual owns the data. This helps to assuage our privacy concerns.*

Keywords: Data privacy, Decentralization, Blockchain, User authority, Web 3.0

I. INTRODUCTION

Decentralization in blockchain refers to the transfer of control and decision-making from a centralized entity (person, organization, or group thereof) to a distributed network. Decentralized networks are designed to reduce the amount of trust that participants must place in one another and to prevent them from wielding power or control over one another in ways that are detrimental to the network's performance.

Blockchain is the most widely used technology in recent years to implement decentralisation. A blockchain is a decentralized database that is shared among computer network nodes. A blockchain acts as a database, storing information in a digital format. Blockchains are well known for their critical function in keeping a secure and decentralized record of transactions in cryptocurrency systems like Bitcoin. The blockchain's novelty is that it ensures the accuracy and security of a data record while also generating trust without the requirement for a trusted third party.

Our social networking platform is based on the Ethereum blockchain and is a decentralized application (Dapp). Ethereum is a decentralized global software platform based on blockchain technology at its heart. Its native cryptocurrency, ether, or ETH, is the most well-known. Anyone can use Ethereum to construct any secure digital technology they can imagine. It has a token built for usage on the blockchain network, but it may also be used to pay for work done on the blockchain by members.

II. EXISTING SYSTEM

In traditional social media, a company organises and controls user data. All of the user information is maintained in a central database. This indicates that the parent organization is free to use all of the data. The user interacts with the system in a traditional social media platform through the user interface, which is usually displayed to them through an application or website. A web-API lies between the user system and the server in most cases, creating a three-tier design. In a typical architecture, the server keeps user data in data canters across the country. The organization owns this data, and they are free to utilize it to create personalized services.

2.1 Disadvantages of Existing System

- The data that the user gives to the organization is directly maintained by the organization that owns the social media
- Each activity that is carried out by the user in the application is monitored by the organization neglecting the privacy of the user.
- Centralized social media is not a benign way to connect with other people. While Facebook & Instagram may connect people better than any other service, it does so at a cost: it gathers troves of data on participants and uses that data to sell targeted advertising.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 6, June 2022
Impact Factor: 6.252

- Algorithmically curated feeds can increase bias and polarization. Facebook user data shapes algorithms that determine what users see in their news feeds in a way that can present a one-sided, echo-chamber view of the world. A view that only affirms and never challenges our views can increase divisiveness and social unrest.

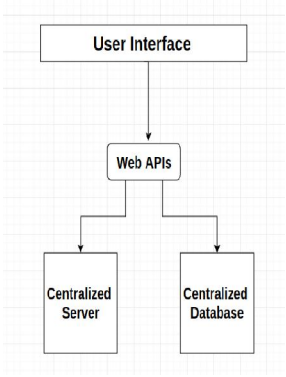

Fig: 1 Architecture of existing systems

2.2 Proposed System

Here also the user interacts with the system through the user interface that is presented to them through a website. Here the API used is web3. This library interacts with the blockchain instead of a server. This blockchain is not controlled by a single entity. All the processing is carried out on this blockchain through the smart contract. Here the data is stored in the IPFS which is a kind of distributed storage that use hash to store and retrieve data.

2.3 Advantages of our System over the Existing Systems

- A decentralized social network allows users more control. Unlike centralized social networking platforms, federated networks foster independence without a central authority
- Benefits include censorship resistance, ownership over personal data, and improved control over user-generated content. In other words, users do not accept censorship and insist on having the final say on their content.
- Decentralized social networks have provided another answer to data privacy and security. On federated social networks, users can create accounts without having to link to real-world identities, like email addresses or phone numbers. Furthermore, these networks often rely on public-key cryptography for account security, rather than relying on a single organization to protect user data.

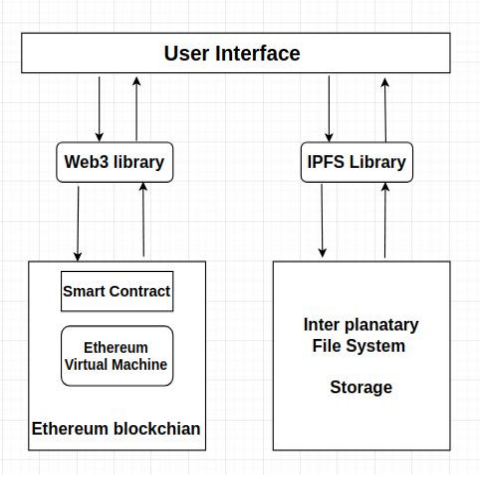

Fig: 2 Architecture of our proposed system

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 6, June 2022
Impact Factor: 6.252

III. SYSTEM ARCHITECURE

The Fig: 3 clearly shows the architecture of our system. As any other web application our platform also works like a normal website but the backend of our system is entirely different from what has been used traditionally.

The front end and the user interface of our system is built using the React frame work of JavaScript. The React framework makes it easy to build a web application very quickly and conveniently. So the frontend of our system is built by following the normal web-development methods. But once we go deep into our system our middle-ware and the backend is totally different from any traditional web application.

The API we are using in our system is a JavaScript web 3.0 framework called Truffle. This framework helps in communicating with a blockchain like Ethereum or Solanium. Truffle framework is a great help to work with Ethereum blockchain. It makes the deployment of smart contract the main functional unit of our system easier. Using this frame work in our system we deploy 2 smart contracts that helps in carrying out two important functions of our application.

The smart contracts helps in making transaction in the ethereum blockchain. Every blockchain has a shared digital ledger that is updated with every transaction that is made on the blockchain. We could say that the smart contracts help the developers to make a transaction and add it to the leger. One of our smart contracts helps in storing the hash of the image that has been stored in the IPFS. And the other helps in tipping crypto coin to the content creators. This smart contract transfers crypto currency form the user's metamask wallet to the content creator's wallet.

The actual storage of the data is done in Interplanetary File System (IPFs). IPFS is a peer-to-peer file-sharing protocol that operates without the need for a central server. The IPFS network is web-based and employs content-addressed storage (CAS) to store and retrieve data based on its content rather than its physical location. This approach is used by IPFS to uniquely identify and retrieve the data requested. When you upload data to an existing protocol node, it's split up into smaller bits, scrambled, and given a unique content identifier (CID), which acts as a fingerprint. This makes storing little chunks of data on the network faster and easier.

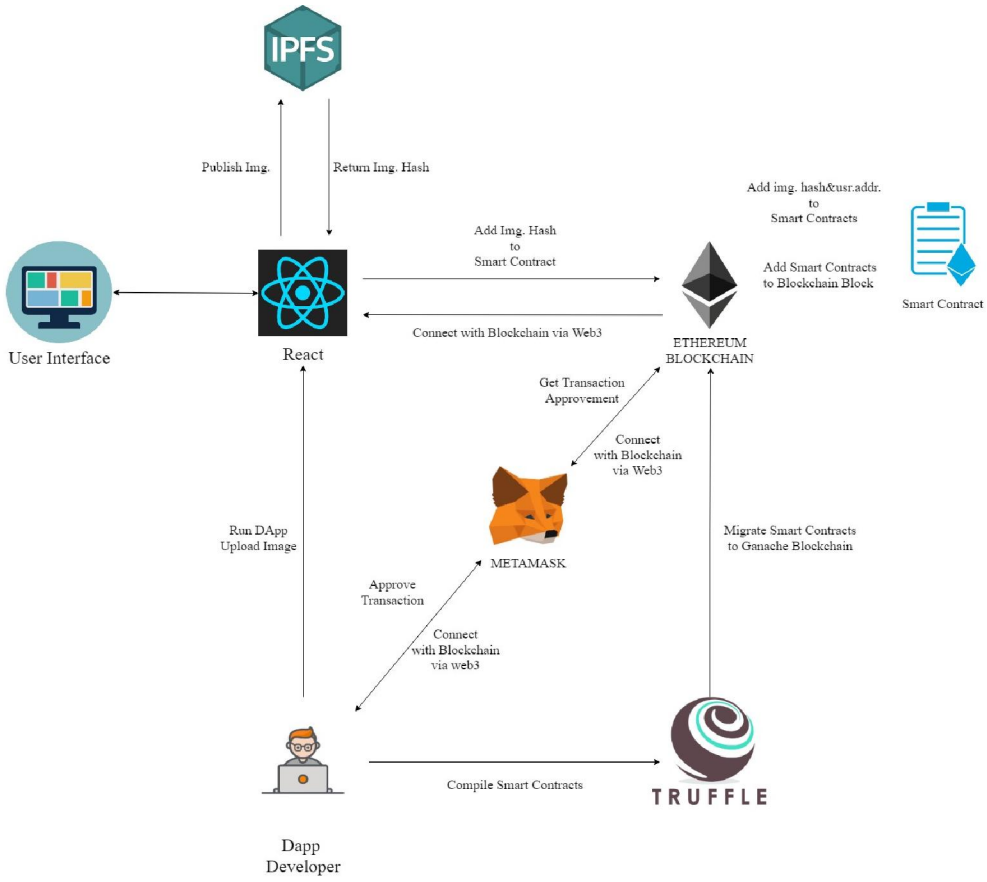

Fig3: System Architecture

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 6, June 2022
Impact Factor: 6.252

Other nodes in the network update their nodes to contain a cached copy of the data once the data is published to the network. They can also supply data in the same way as the initial node did. It is up to a node whether to maintain and continue to provide this data or to discard it in order to save memory, for example. A new cryptographic hash (CID) is generated for each new upload of fresh data or prior uploaded data, making each upload to the network unique and resistant to security breaches or tampering. IPFS employs a decentralised naming mechanism to determine the file's name, which is the lengthy CID string, and then uses DNSLink to convert the CID to a more human-readable DNS name.

Once the system publishes the data to the IPFS, a hash is returned. This hash is then stored in the blockchain by using the smart contracts. By doing so we are storing the data in an entirely unbreachable and uncompromisable way. This improves the security of the data greatly. Also, there is no organization that owns the data like other social media platforms. Thus, the data stored is not used by anyone to breach privacy in the name of providing extra convenience service.

IV. Module Description

4.1 Frontend Module

The frontend of our system is a website that is built using React framework. The user is able to select the image that the user wants to upload with a description. The user is able to see their post and the post made by other users in the newsfeed. The post in the newsfeed is sorted by the popularity and the amount tipped to the post. The user can support the creator of their favourite content by tipping Ethereum coin. The user can tip by clicking the tip button on the bottom right of each post.

4.2 Storage Module (IPFS)

We have to use MetaMask to access our website. Our social media platform allows users to upload images and descriptions. After uploading, here comes the backend of this site. When a user clicks upload, an API call will be called by this code through JavaScript.

```
constipfsClient = require('ipfs-http-client')
constipfs = ipfsClient({ host: 'ipfs.infura.io',port:5001,protocol: 'https'})
```

We use Infura.io to store the image via IPFS. They are like 3rd party providers for an IPFS client. They will manage everything related to the IPFS. The Infura.io IPFS client provider will give us the hash of the image that the user uploads to the social media (Dapp).

4.3 Smart Contract to Upload Image

Our social media (Dapp) will use smart contracts to link or attach an image hash returned by infura.io to the block in the blockchain. Then the smart contract will return a transaction request to the user to pay a gas fee (ETH) for uploading an image to the social media.

If the user process transaction successfully, their ETH will be transferred to the smart contract address & the photo will be uploaded. Finally, anyone who visit our social media will be able to see the uploaded image in the newsfeed. If the user didn't process the transaction successfully, the image of the hash will not be linked to the block in the blockchain. Whether the user processes a transaction successfully or not, the uploaded image of the hash will be stored in the infura.io ipfsClient

4.4 Smart Contract for Transferring Crypto

To provide incentive to the content creators we use tipping system where other user can donate cryptocurrency to the creator of their favourite post. To tip 0.0001ETH to the creator, the user can click the Tip button on the bottom right of each post.

Now, the system calls the smart contract and the smart contract returns a transaction request to the user. When a transaction is "done," it refers to the transfer of 0.001 ETH from the tipper’s wallet to the creator of the content via smart contract.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 6, June 2022
Impact Factor: 6.252

VI. CONCLUSION

It is safe to infer that the moment has come for users to understand and, as a result, have control over what data is sold, to whom, and for what purpose. People who use social media just shouldn't stand by and watch while their confidence is blatantly betrayed, resulting in the violation of their valuable privacy. Individuals can reclaim much of the authority and power they lost when they used centralized social media by switching to new decentralized, open-source social media platforms. True, network centralization was developed to increase efficiency and capitalize on economies of scale. Decentralization, on the other hand, tries to improve the network's speed and flexibility by concentrating processing power on a single individual.As a result, block chain has emerged as the technology of the future. As an outcome, these unique environments have their own set of benefits and drawbacks. There isn't much of a difference between the two, so it's difficult to say which is better. However, it is more likely that the glory days of traditional centralized social media have passed, and that decentralized social media platforms are attempting to break into the market and position themselves as a safer and more reliable alternative.

ACKNOWLEDGMENT

I'm taking advantage of this opportunity to convey my gratitude to everyone who assisted me with the study venture report direction. We'd want to thank all of our teachers, friends, and family members who have helped us complete our project successfully, both directly and indirectly. Mrs. Reena R M.E, Head of Department and Mrs.S.Bhuvaneswari M.E, Computer Science and Engineering, Prince Shri Venkateshwara Padmavathy Engineering College, Chennai, Tamil Nadu, India, deserves special mention for their assistance in bringing this project to a successful finish.

REFERENCES

[1]. Hrishikesh Bawane1, Tanuja Shinde2, Abhishek Kadam3, Yash Budukh4, Prof. Pooja Mundhe5.Ethegram - An Ethereum and IPFS-based Decentralized Social Network System.2020
[2]. Satoshi Nakamoto. Bitcoin: A peer-to-peer electronic cash system. Consulted, 1(2012):28, 2008
[3]. Jon Evans. Bitcoin 2.0: Sidechains and ethereum and zerocash.2014.
[4]. Lanier, Who owns the future?. London: Penguin Books, 2014, pp. 32-66
[5]. J. Benet, "IPFS - Content Addressed, Versioned, P2P File System (white paper)", 2014.
[6]. F. Ehrsam, "The dApp Developer Stack: The Blockchain Industry Barometer", Medium, 2017. [Online]. Available: https://medium.com/ @FEhrsam/the-dapp-developer-stack-the-blockchain-industrybarometer-8d55ec1c7d4.
[7]. M. Qamar, M. Malik, S. Batool, S. Mehmood, A. W. Malik, and A. Rahman, “Centralized to decentralized social networks: Factors that matter,” pp. 37–54, 2016.
[8]. YUAN Yong and WANG Fei-Yue, Blockchain: The State of the Art and Future Trends, ActaAutomaticaSinica, vol. 42, no.4, pp.481-494, April, 2016.

.