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Designing The User Experience On A Decentralized Social Media Network: Openwave

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Abstract

The implementation of blockchain technology to decentralize social media networks (DSN) is causing a substantial shift in online interactions. This study looks into the user experience and design concepts underlying DSN, with a focus on OpenWave, a novel platform recently developed. DSN eliminates intermediaries and distributes data across multiple nodes, resulting in improved privacy, transparency, and greater control for users. However, this creates distinct complications. such as complex user interfaces, limited features to promote usability, and steep learning curves that impede their widespread adoption. To improve overall user interaction within decentralized social media platforms despite the obstacles identified above, this research identifies commonplace problems faced alongside personal preferences uniquely designed towards producing tailored principles aimed at crafting more engaging but simplified UI/UX experiences toward achieving optimal benefits from using DSN structures while creating new block-chain based solutions crafted through integrating novel UX paradigms able to revolutionize traditional norms associated with typical usage patterns frequently attributed digital innovations combining essential human-centered designs conjoined around analyzing existing approaches so far employed concerning blockchain-based systems optimizing vital changes promoting exceptional user experience outcomes leading to better adoption rates encouraging developers to adopt sustainable standards aiding continued improvement whenever implementing the conventions advanced herein providing holistic approach guidelines planed out comprehensive procedures championing strategic action plans fashioned towards actualizations intended goals specializing advantages inherent in resilient self-owned infrastructure shown capable growth, OpenWave's suggested design and implementation encapsulate key principles by demonstrating DSN ability to provide a secure, user-centric alternative to traditional social media platforms. The findings provide a hopeful picture for the future of DSN, highlighting opportunities for increased privacy functions, scalability solutions, greater correlation with emerging technologies, and increasing interoperability.

Keywords— Decentralized Social Media, User Experience Ethereum, Smart Contracts, Blockchain, Dapp, IPFS.

Introduction

The foundation of a decentralized social media network (DSN) is blockchain technology, which records transactions across several computers. It eliminates the need for middlemen and operates on a distributed methodology. It guarantees transparency and permits direct user interaction. The ability of decentralized social media, to grant individuals more control over their data and privacy has led to their enormous rise in popularity in recent years. Compared to centralized social media, DSN adoption is still low for several reasons, such as the user interface's complexity, the absence of features that make it easy for users to use,

and the steep learning curve's steepness. Many developers and designers are concentrating on enhancing the user experience (UX) of DSN as a result of this circumstance.

Creating a user experience, in social media networks is essential for developing engaging and efficient platforms. These platforms strive to offer users a secure and transparent social media experience by utilizing blockchain technology and decentralized governance models. The main challenges in designing the user experience for social media involve ensuring easy-to-use interfaces providing clear onboarding processes and finding the right balance between usability and security/privacy features. To address these hurdles designers can utilize various tools such as design systems, user research, wireframing, and prototyping tools. Keep up with emerging trends like tokenizing interactions managing decentralized identities and sharing content in a decentralized manner. By prioritizing user needs and preferences designers can develop user-friendly and secure interfaces to enhance the user experience, on decentralized social media platforms.

However present-day social networks are defined by a framework that restricts users' access to network-based information and services the main social media function as separate data silos enclosing user privacy and control in addition to impeding the free flow of information. Social networking platforms currently in use frequently offer restrictive privacy settings that only let users create basic associations between pre-established categories of personal data and approved contract groups additionally, these privacy settings are usually limited to certain platforms, which makes it challenging for users to consistently implement the policies they want across a range of online activities.

More decentralized and user-centric strategies that grants individuals more autonomy over their personal information and online interactions are becoming more and more necessary as the social media landscape changes. Another factor that is noted as possibly affecting what people view is the lack of transparency surrounding the algorithms used to curate material. Platforms can use opaque algorithms and undisclosed factors to selectively display content to users through algorithmic curation, possibly affecting the information users see and the decisions they make. Users are only partially informed about how algorithms operate throughout this curation process, nor are they aware of the standards that dictate which content is given priority.

The motive of the research is to identify common pain points and user preferences to create a set of tailored principles for design that can guide the development of a more user-friendly and engaging decentralized social media platform, and implementing it on our newly built decentralized social media platform "OpenWave" based on these principles.

Literature review

Social media platforms with centralized content selection, ease of use, and connectivity have dominated the online realm for a considerable amount of time. Social media companies such as Facebook and Twitter provide centralized data storage and control, but they also create concerns about algorithmic biases, censorship, and data privacy. Unlike other protocols, DNS distributes control and data storage across a network of nodes using peer-to-peer protocols or blockchain technology, ensuring user autonomy, durability, and transparency.

A. Decentralized vs. Traditional Social Networks

Centralized social media networks, such as Facebook, Instagram, and Twitter, are run by a single entity that also manages user accounts, content moderation, and data storage. This centralization enables more ideal user experiences, consistent interfaces, and efficient moderating. It does, however, carry major hazards, including concerns about data privacy, censorship flaws, and monopolistic control over user interactions and data. Decentralized social media networks distribute power over several nodes using peer-to-peer protocols and blockchain technology. Decentralization aims to increase user autonomy, privacy, and resistance to censorship. DSNs are not ultimately owned by a single company, which aims to democratize

the platform while following privacy and data sovereignty regulations. However, due to its scattered nature on the other hand, the distributed nature raises concerns about community management, data management, and user experience design.

B. Blockchain-based Social Media Platforms

Social media networks developed using the technology of blockchain provide a fresh way to online communication by leveraging decentralization to enhance user autonomy, privacy, and data ownership. This section discusses a variety of notable blockchain-based social media platforms, including the Lens Protocol Ecosystem, Peepeth, Minds, Mirror, and Sapien, as well as relevant research and case studies. Each of these platforms offers unique features.

Hey (previously Lenster) is a feature-rich, decentralized social networking web application. The seasoned team behind Aave unveiled the Lens Protocol, a truly composable and decentralized social graph, in 2022. Within the expanding LensVerse ecosystem, users can add a Lens handle as an NFT to their cryptocurrency wallet, which is appropriate for several decentralized apps (dApps). Lens Protocol on the Polygon network/EVM allows for rapid transactions and low gas costs.

Peepeth, an open-source microblogging platform built on the Ethereum blockchain, makes use of the Interplanetary File System (IPFS). Peepeth aims to offer a safe, private, and censorship-free social networking experience in place of more established platforms. Users can send "Peeps," which are brief communications that cannot be changed or withdrawn. The ability to tip other users using the Ether (ETH) cryptocurrency is an intriguing addition.

Mirror is a Web3-inspired writing platform built on blockchain that prioritizes user ownership and decentralization. By linking their wallets, users can access Mirror for free, publish, and read. Posts written on Mirror can be turned into collectible NFTs known as "Writing NFTs," and they are kept permanently on the decentralized storage network Arweave. Mirror gives authors the ability to directly profit from their creative pursuits by enabling them to sell their work through cryptocurrency subscription payments.

Sapien is a social news network built on Ethereum that emphasizes democracy and flexibility. Functioning as a Web3 social network, it tackles the issue of bogus news while offering incentives to content producers. The platform's main goal is to provide individuals authority over their content and data. Tokens are earned by Sapien producers via conversations with other participants and the sharing of accurate content assessed by the community.

Methodology

Digital social networking platforms on the internet are becoming increasingly rational centralized web services. The centralized structure of online social networks has several drawbacks, including scalability, anonymity, dependency on a provider, the need to be online for every transaction, and lack of proximity. Consequently, several initiatives to decentralize have been undertaken on online social networks while maintaining the services offered by centralized online social networks. Large online social network sites use content distribution networks, which share some of the load through caching, but user and application data is maintained in a centralized repository. a dispersed social media network that operates independently of a certain core infrastructure. We will be using the Web 3.0 design principles to develop our dApp, the Web3 design principles provide extensive guidelines for developing user-centric and unique web experiences inside the Web3 ecosystem.

A. Design Principles

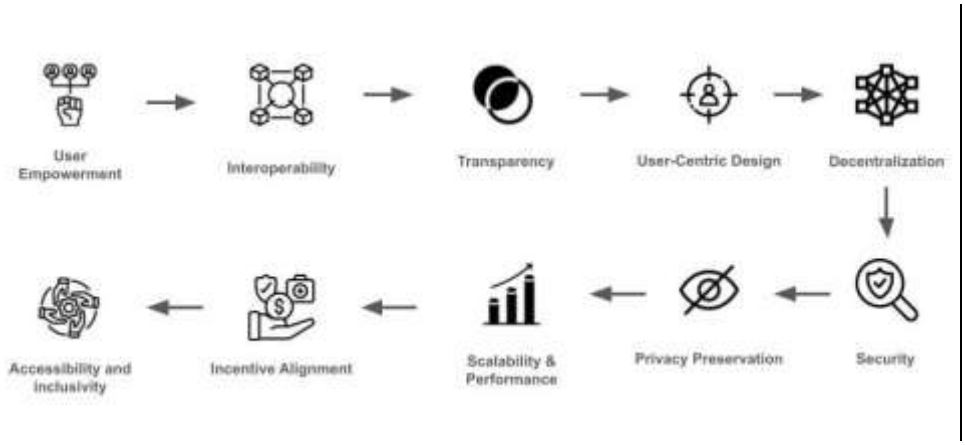

Figure 1. Design Principles

1. User Empowerment

Allow users to exercise authority over their data and assets. Create interfaces that promote transparency and enable people to safely manage their digital identities and assets.

2. Interoperability

Promote interoperability among various blockchain networks and applications by developing adaptive and modular interfaces. Allow for seamless interactions across platforms to improve user experiences and increase the accessibility of Web3 solutions.

3. Transparency

Transparent design techniques help to build trust and accountability. Allow people to see how their data and assets are maintained, ensuring clarity on transactional information, smart contract operations, and governance processes.

4. User-Centric Design

Keep the user at the centre of the design process. Understand the user's needs, preferences, and challenges. Create interfaces that prioritize UX and provide simple navigation, clear communication, and smooth interactions.

5. Decentralization

Design systems that distribute control and ownership among users, making use of Web3's decentralized nature. Use decentralized structures to reduce reliance on central authorities. It strengthens systems' resilience and resistance to censorship.

6. Security

Security is a significant consideration during the design process. To keep things safe, employ strong cryptography methods such as secure authentication and data encryption. Also, utilize multi-factor authentication and keep track of actions to prevent user data from being accessed or misused.

7. Privacy Preservation

Prioritize user privacy by collecting minimum data and implementing privacy-enhancing technology such as zero-knowledge proofs and decentralized identity solutions. Provide users with exact control over their data, allowing them to properly manage consent and permissions.

8. Scalability & Performance

Address scalability issues in decentralized systems by developing simplified protocols and architectures capable of supporting growing user bases and transaction volumes. Improve performance to provide smooth and reliable user interactions, especially when the network is congested.

9. Incentive Alignment

Encourage teamwork and long-term success by ensuring that users, developers, and network members have common incentives. Create token systems that promote beneficial behaviors such as active network involvement, decision-making contributions, and value enhancement.

10. Accessibility and inclusivity

Ensure that Web3 is user-friendly and inclusive of people from various backgrounds, skills, and technological expertise levels. To welcome everyone, including translation options, assistive technologies, and simple interfaces.

B. Problems Identified with the Existing System

1. Data administration is difficult

Handling cryptographic keys, transferring data across nodes, and safeguarding the privacy of their data are all common tasks for users. In contrast to centralized platforms, which are overseen by a single business, this is a significant barrier to its widespread use because it might be frightening for non-technical users.

2. Issues with Trust and Transparency

The effectiveness of social media networks depends on transparency and trust. Due to their decentralized structure, Users could find it difficult to understand who can access their data, how decisions are made in the network, and how it is controlled. This uncertainty has the potential to erode trust and deter users from making the most of a website

3. Recycled posts and content

Content recycling, which occurs when identical postings and materials are dispersed across multiple nodes or instances, is a frequent occurrence on DSN. The UX may be blocked by this repetition, making it more difficult for users to discover fresh and engaging content. As decentralized networks, these lack a central mechanism for material selection or filtering according to relevance or uniqueness. Users might thus come across the same information more than once, which would lower the site's overall quality and level of engagement.

4. Content creators have few options for monetization

A significant number of DSN don't give content producers a useful opportunity to make money off of their creations. Conventional social networking platforms typically offer multiple money streams, including sponsored content, direct fan contributions, and ad revenue sharing. Unfortunately, the majority of DSN don't have built-in monetization capabilities, which makes it harder for writers to make money off of their work. This could deter the creation of high-caliber material and lessen the motivation for creators to add to the platform, which would decrease the breadth and depth of content that is accessible to consumers.

5. Moderators act as information gatekeepers

The platform's decentralization may make moderation in DSN problematic. While decentralized moderation is intended to democratize content management, it may introduce errors and biases. In certain cases, moderators act as gatekeepers, limiting posts based on subjective factors rather than community standards. This top-down filtering strategy has the potential to stifle free expression and create an environment in which certain viewpoints are unfairly ignored. The lack of clearly defined moderating criteria and methods exacerbates the issue, making it impossible to maintain a balanced and fair content moderation system

C. *Analysis of the Proposed System*

OpenWave is an IPFS-based platform that does not require infrastructure or a centralized server. Blockchain technology uses a distributed ledger, which is controlled by a user network, to store and process data.

1. To store and transfer cryptocurrency, users install a digital wallet and create an account on the network.
2. On the site, users can interact with other users, share media, join group and publish posts. All activities are recorded on the Ethereum blockchain.
3. For users to publish a post on the website, they need to pay with cryptocurrency.
4. The platform's consensus method verifies transactions and maintains blockchain integrity. The consensus approach is frequently proof-of-work or proof-of-stake, forcing users to make a computational effort or own a certain amount of digital currency to participate.
5. The platform's decentralization precludes central authorities from influencing or manipulating the material. Instead, users are responsible for controlling and managing their content. This can be accomplished using community-based moderation or decentralized autonomous organizations.

D. *Design of the Proposed System*

The intended system's functionality is outlined in its design. Technologies founded on the Unified Modelling Language (UML) are used.

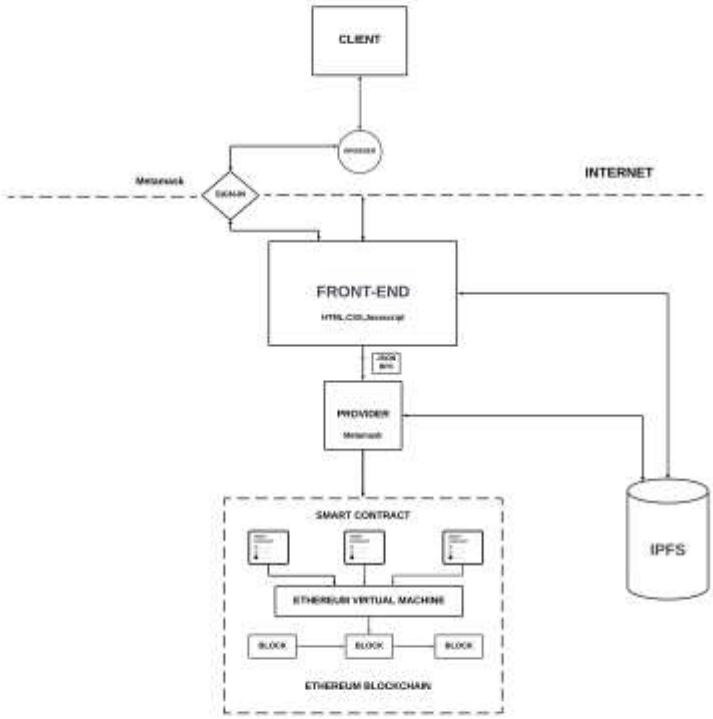

Figure 2. System Architecture

Implementation

Creating a decentralized social media network requires fully understanding decentralized technologies and their underlying principles. The steps for creating a decentralized social media platform are as follows:

1. Select blockchain or decentralized technology for your social media platform. Ethereum, Solana, and Subsocial are among the most popular decentralization technologies.

2. Create a smart contract, smart contracts are blockchain-based, self-executing contracts. You can use them to set guidelines and policies for your social media platform. Make a smart contract that enables users to communicate, submit information, and establish accounts.

3. Create a user interface to permit users to interact with the platform after the smart contract has been developed. Users should be able to simply create accounts, publish information, and communicate with others.

4. Implement content moderation, decentralized social media networks require content moderation. Use a decentralized system of moderators to ensure material on the site follows rules and laws.

5. Integrate cryptocurrency payments to reward content providers and moderators. Decentralized payment systems allow consumers to accept payments directly to their digital currency wallets.

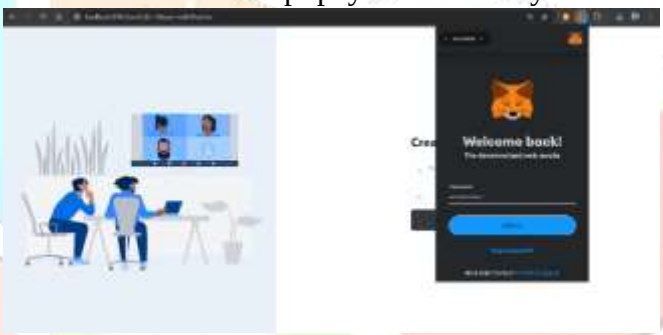

Figure 3. Wallet Connection

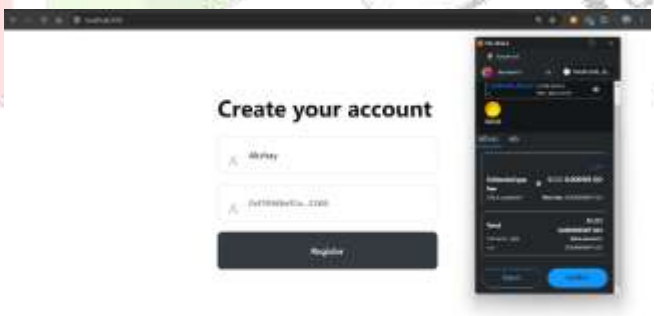

Figure 4. Create Account

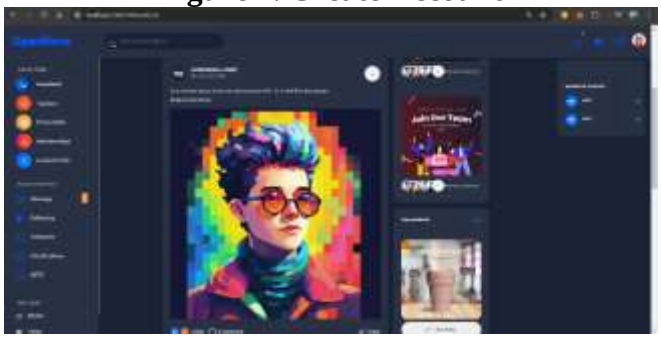

Figure 3. Home Page

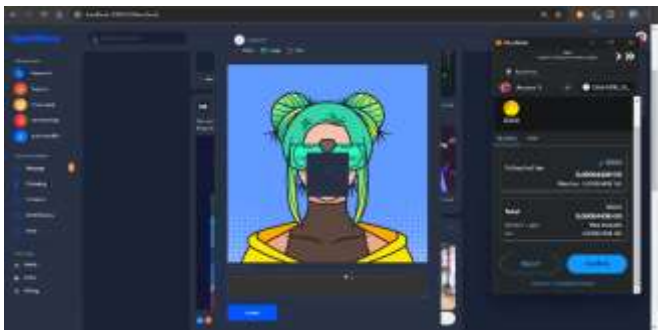

Figure 3. Post Creation Page

Figure 5. Membership Page

Conclusion

Decentralized social media networks, such as OpenWave, promise a huge step forward in online interaction by utilizing blockchain technology to improve user control, privacy, and transparency. Despite these benefits, DSN encounter problems such as confusing interfaces, high learning curves, and restricted functionalities, which slow their adoption. Our findings highlight the necessity of creating user-friendly interfaces that prioritize user authority, compatibility, transparency, and security. This method assures that decentralized platforms are inclusive and user-friendly, addressing both practical needs and decentralization goals. Analysis of platforms such as Peepeth, Sapien, Mirror, and Lens Protocol exposes DSN-specific methods and obstacles, such as transparency issues and content management complications. OpenWave intends to address these issues through a bespoke set of design principles based on user needs. Built on IPFS and Ethereum, OpenWave stresses user liberty and data sovereignty through decentralized moderation and consensus methods. These elements assure justice, defy censorship, and promote high-quality content creation, setting a good model for a more distributed future. As the demand for user-centric, decentralized platforms rises, OpenWave's strategy serves as a road map for future developments. OpenWave has the potential to revolutionize decentralized social networking by tackling fundamental challenges and prioritizing user requirements, resulting in increased worldwide adoption and a more equitable online environment.

Future scope

The future of decentralized social media networks, like OpenWave, is full of opportunities for innovation and growth. Given the digital age advances, various attractive development and enhancement opportunities emerge. Improving compatibility with blockchain networks and traditional social media platforms would enable smooth interactions across ecosystems, allowing users to shift data and maintain connections irrespective of the underlying technology. Advanced cryptographic approaches, such as zero-knowledge proofs and homomorphic encryption, can improve users' confidentiality and safekeeping by ensuring data remains secure and protected in a decentralized environment.

Addressing scalability issues with solutions such as sharding, layer 2 protocols, and efficient consensus methods might enable decentralized social media networks to handle higher numbers of transactions and users without sacrificing performance. Continuous enhancement of user interfaces with intuitive design components, tailored experiences, and adaptive interfaces might help decentralized systems reach a larger audience. Developing strong decentralized identity solutions would enable users to securely manage their digital identities across many platforms, giving them more control over personal information and preventing identity theft and fraud. Integrating DeFi capabilities might open up new avenues for monetization and engagement, permitting users to participate in decentralized lending, staking, and earning mechanisms directly on the social media platform.

Exploring complex decentralized governance models, such as decentralized autonomous organizations (DAOs), can improve content moderation and platform governance by allowing communities to collectively decide on platform policy and dispute resolution. Leveraging AI and machine learning can improve content curation, spam detection, and tailored recommendations while adhering to decentralization principles, thereby filtering harmful content and promoting useful interactions. Integrating AR and VR technology can result in immersive social experiences, offering consumers new and compelling ways to connect and share content. Through addressing these issues, future decentralized social media networks can become more stable, user-friendly, and widely embraced. OpenWave and related platforms can transform the social media landscape by providing a more democratic, safe, and engaging online environment for people globally.

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