



# Decentralized Social Media & NFT Marketplace

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**Abstract:** Social media platforms have firmly established themselves in our daily lives. However, traditional social media platforms are centralized, which means they have complete control over users' data and content. In recent years, there has been a growing demand for decentralized social media platforms that are more transparent and secure. In this paper, we present a decentralized social media application built on the Ethereum Virtual Machine (EVM) that integrates a NFT marketplace.

**Index Terms - NFT, EVM, Blockchain, Social Media, Decentralized, Solidity, Smart Contract, NextJS, MetaMask, Ethereum**

## I. INTRODUCTION

Social media has completely changed how we interact with one another and exchange information. The centralized nature of these applications has led to various privacy and security concerns, making users vulnerable to data breaches and censorship. Decentralized social media platforms have emerged as a solution to these concerns, as they allow users to control their data and content.

The proposed platform aims to provide users with a transparent, secure, and decentralized social media experience. The platform has basic social media features such as profile creation, post creation, commenting, liking, and sharing. However, the platform also offers a unique NFT marketplace where creators can mint their posts into NFTs by paying a mint fee.

The NFT marketplace provides creators with a new revenue stream and the ability to monetize their content. NFTs are a type of digital asset that represents ownership of a unique piece of content, such as art, music, or videos. By minting their posts into NFTs, creators can sell their content to interested buyers in a decentralized and transparent manner.

The platform is built on the Ethereum blockchain, which offers several advantages over traditional social media platforms. The Ethereum blockchain is decentralized, which means that no single entity has control over the platform. Additionally, the platform's architecture is transparent, which means that users can track and verify transactions on the platform.

## II. SCOPE

NFTs have carved out a place for themselves in social media, music, art, travel, and finance. Today's market is filled with NFT-based platforms that primarily target the social media sector.

Influencers and owners of social media accounts now have the chance to convert their content into blockchain-powered digital NFTs thanks to the social media NFT marketplace. NFT for social networking offers a platform to trade videos, reels, photos, pictures, gifs, and other social media content while monetizing the social media platform by cutting out the cost of middlemen. The market value of social media NFTs is raised by the marketplace for social networks, which also offers auction listings, governance frameworks, and regulates alluring incentives for bidders, buyers, and fans of artists. By monetizing social media in a safe and decentralised manner, NFT for social networking transforms the social media industry.

The social media NFT marketplace is a platform that cuts out the middlemen and lowers the cost for celebrities to reach their audience. It enables them to showcase their works of art and videos to bidders directly in a non-fungible token for the highest price.

Following sports and music, social media will witness the inflow into the NFT market. Influencers on social media today have a wider audience reach and more power over it. Social media not only combines all other industries, but it also draws influencers and celebrities from all parts of society, including musicians, athletes, artists, and everyone else. The market combines the best elements from each of the three industries—social media, NFTs, and finance.

A unique work of music, art, or any other product made by an influencer may be turned into an NFT and sold to their followers. Influencers can create an NFT from any of their photos, memories, or other content. Similar to how influencers can make money off of their content, users and followers can build up a portfolio of NFTs that they can then resell for a profit. Additionally, users can stake tokens to gain access to exclusive content and to generate revenue. As a result, fans will have an equal opportunity to profit from the platform in addition to influencers.

### III. LITERATURE SURVEY

Decentralized social media platforms have gained popularity in recent years due to the growing concerns over privacy and security on traditional social media platforms. The use of blockchain technology has enabled the development of decentralized social media platforms that provide users with more control over their data and content. In this section, we review the existing literature on decentralized social media platforms and NFT marketplaces.

#### A. Decentralized Social Media Platforms

Several decentralized social media platforms have been developed in recent years, such as Mastodon, Steemit, and Peepeth. Mastodon is a federated social network that is built on a decentralized architecture. The platform allows users to create profiles, post content, and interact with other users. Steemit is another decentralized social media platform that is built on the Steem blockchain. The platform rewards users for creating and curating content using cryptocurrency tokens. Peepeth is a decentralized social media platform that is built on the Ethereum blockchain. The platform allows users to post messages that are stored on the blockchain.

#### B. NFT Marketplaces

NFTs are a type of digital asset that represents ownership of a unique piece of content. NFTs have gained popularity in recent years, with several NFT marketplaces being developed. OpenSea is a decentralized NFT marketplace that allows creators to mint and sell NFTs. The platform supports a wide range of NFTs, including art, music, and videos. Rarible is another decentralized NFT marketplace that is built on the Ethereum blockchain. The platform allows creators to mint and sell NFTs without the need for coding skills.

#### C. Integration of Marketplaces with Social Media

The integration of NFT marketplaces with social media platforms provides creators with a new revenue stream and the ability to monetize their content. Several platforms have already integrated NFT marketplaces with their social media platforms. For example, Cent is a decentralized social media platform that integrates an NFT marketplace. The platform allows creators to monetize their content by minting it into NFTs and selling it to interested buyers. SuperRare is another platform that integrates an NFT marketplace with a social media platform. The platform allows creators to sell their unique digital artwork as NFTs.

However, these platforms still face several challenges. One of the main issues is the lack of scalability, which limits the number of users and transactions that can be supported. This can result in slow transaction times, high fees, and poor user experience. Another challenge is the difficulty of onboarding new users, as the process of setting up a wallet and acquiring tokens can be complex and confusing for non-technical users. Additionally, the lack of a clear governance framework and standards can result in fragmentation and uncertainty in the ecosystem.

On the other hand, centralized social media apps such as Facebook, Twitter, and Instagram have massive user bases and are relatively easy to use. However, these platforms have several issues related to data privacy, censorship, and control. For example, centralized platforms have been accused of using user data for targeted advertising and selling user data to third-party companies. Additionally, these platforms can censor content

based on their policies or political biases, and they can suspend or ban user accounts without due process. Moreover, content creators often struggle to monetize their work fairly, as the platforms take a significant cut of the revenue generated.

NFT marketplaces, which enable the creation, sale, and exchange of unique digital assets, have exploded in popularity in recent years. However, these marketplaces also face several issues. One of the main challenges is the lack of standardization and interoperability, which can make it difficult to exchange NFTs across different platforms. Additionally, the high gas fees associated with some NFT marketplaces can make it expensive for creators and collectors to participate. Another challenge is the environmental impact of NFTs, which has been criticized for its high carbon footprint and energy consumption.

#### IV. EXISTING SYSTEM

The traditional social media applications are under the control of a single central authority. These companies have the user data stored to them which can be then sold to other companies. The privacy of the user can be potentially violated. Here, the ratio of the income of the authority and the actual content creators is highly biased towards the authority. Content creators usually get less value out of their creativity. Moreover, the threat of single point of failure also lies in such systems.

Let's first consider the disadvantages of centralized social media networks in order to fully comprehend the significance of blockchain-based, decentralized social networks. The three main issues with the centralized nature of social media are as follows:

- In social media networks, users are the products and advertisers are the customers. Social media platforms like Facebook earn revenues by selling users' personal data to targeted marketing or advertisers.
- Social media is also used as a platform for disseminating propaganda to influence users' opinions on social issues.
- Centralized services are relatively easier to break into.
- The threat of single point of failure always lies in such systems.

#### V. PROPOSED SYSTEM

We want to create a platform that cuts out the middleman fees between content producers and their audience, enabling them to directly showcase their works of art and videos to the highest-bidding bidder using a non-fungible token.

Social media will experience the inflow into the NFT market after sports and music. Influencers on social media today have a wider audience reach and more power over it. Social media not only combines all other industries, but it also draws influencers and celebrities from all facets of society, including musicians, athletes, artists, and everyone else. The market combines the best elements from each of the three industries—social media, NFTs, and finance.

An influencer may create a unique piece of music, artwork, or any other product, turn it into an NFT, and sell it to their followers. Influencers can use any of their images, recollections, or other content to create an NFT. Users and followers can accumulate a portfolio of NFTs that they can then resell for a profit, much like influencers can do with their content.

Users can also stake tokens to gain access to premium content and to make money. As a result, in addition to influencers, fans will also be able to make money off the platform.

## VI. TECHNOLOGIES & ALGORITHMS USED

Multiple algorithms and techniques are used by the decentralized social media application with an NFT marketplace to guarantee the platform's security, scalability, and effectiveness.

### A. DLT

To start, the platform maintains a secure and decentralized database of user-generated content and NFTs using distributed ledger technology, such as blockchain. This makes it possible for users to fully control their data and NFTs, eliminating the need for a central authority to oversee transactions.

### B. Consensus Algorithm

The platform uses the Proof of Stake (PoS) consensus algorithm to authenticate and validate transactions on the blockchain network. Based on the amount of cryptocurrency they "stake," or hold, validators, also referred to as stakers, are chosen to create new blocks and validate transactions in a proof-of-stake (PoS) blockchain network. The likelihood that a validator will be selected to build new blocks and collect transaction fees increases with the size of their stake.

### C. Cryptography

The platform secures user data and NFTs using cryptographic methods like public-key encryption and digital signatures. This safeguards user privacy and guarantees that NFTs can only be changed or transferred by their legitimate owner.

### D. Web3 Auth

By utilising social accounts and devices that the majority of users already own, Web3Auth, a non-custodial key infrastructure solution for web3 apps and wallets, hopes to address these issues and make it possible for users to manage their keys easily. Our application will make use of Web3 Auth to provide a quick and secure authentication process.

### E. Smart Contracts

Smart contracts are simply blockchain-based programmes that execute when certain criteria are met. They are typically used to automate the execution of an agreement so that all parties can be certain of the outcome right away, without the need for an intermediary or additional time. This platform utilizes smart contracts to enable the minting, buying, and selling of NFTs on the marketplace. This ensures that all transactions are executed automatically and securely, without the need for intermediaries or middlemen.

Overall, the combination of these algorithms and techniques allows for the creation of a decentralized social media application with a secure and efficient NFT marketplace, providing users with full control over their data and enabling the creation and exchange of unique digital assets.

## VII. WORKING AND ARCHITECTURE

The proposed decentralized social media application with an integrated NFT marketplace is built on the Ethereum Virtual Machine (EVM) and uses the Ethereum blockchain as its underlying infrastructure. The platform has two main components, the social media component and the NFT marketplace component.

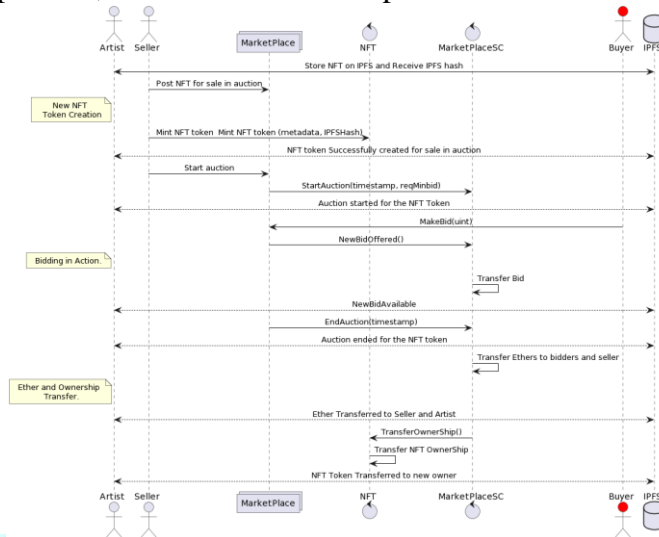


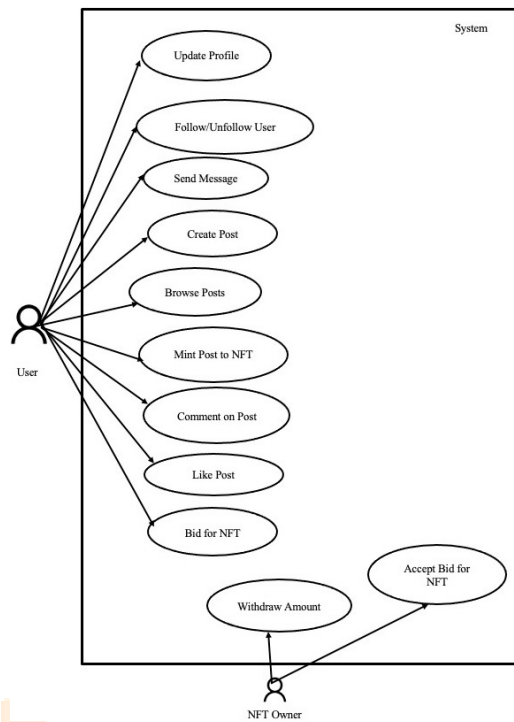
Fig – 1: Sequence Diagram

### A. Social Media Component

The social media component of the platform allows users to create profiles, post content, comment, like, and share posts with other users. When a user creates a post, it is stored on the Ethereum blockchain as a smart contract. The smart contract contains information about the post, such as the content, the user who created the post, and the timestamp. The smart contract also contains a unique identifier that is used to link the post to its corresponding NFT.

### B. NFT Marketplace Component

The NFT marketplace component of the platform allows creators to mint their posts into NFTs by paying a mint fee. When a creator mints a post into an NFT, a new smart contract is created on the Ethereum blockchain. The smart contract contains information about the NFT, such as the content, the creator, and the timestamp. The smart contract also contains a reference to the smart contract of the original post. This reference ensures that the NFT is linked to the original post and allows the NFT to be verified as an authentic representation of the post. When a user wants to buy an NFT, they can do so by sending a transaction to the NFT smart contract on the Ethereum blockchain. The transaction contains the payment amount and the buyer's address. Once the transaction is verified, the NFT smart contract transfers ownership of the NFT to the buyer's address.



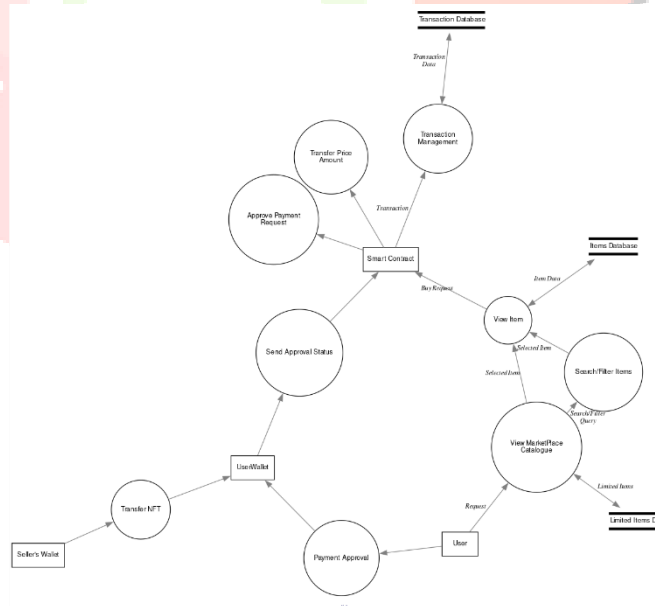
**Fig – 2: Use Case Diagram**

In this use case diagram, we can see the different actors that interact with the system, including social media users and NFT marketplace users. The use cases for each actor are listed within their respective boxes.

Social media users can view their feed, post content, like and comment on content, and share content. They can also view the NFT marketplace and buy or sell NFTs.

NFT marketplace users can view the NFT marketplace, mint NFTs, and buy or sell NFTs.

At a high level, the system can be broken down into four main components: users, social media platform, NFT marketplace, and blockchain. The data flow between these components can be illustrated in the following DFD:



**Fig – 3: Data Flow Diagram**

The architecture of the proposed decentralized social media application with an integrated NFT marketplace is decentralized, which means that there is no central authority controlling the platform. The platform is built on the Ethereum blockchain, which provides several advantages, including transparency, security, and decentralization.

The platform's architecture is composed of two layers, the application layer and the blockchain layer. The application layer is responsible for providing the user interface and implementing the social media and NFT marketplace components. The blockchain layer is responsible for storing and verifying the smart contracts

that implement the platform's functionality. The platform's architecture is designed to be modular, which means that the social media and NFT marketplace components can be updated independently of each other. This modular design allows for more flexibility and easier maintenance of the platform.

### VIII. RESULTS

The proposed decentralized social media application with an integrated NFT marketplace was implemented and tested on the Ethereum blockchain.

The tests demonstrated that the platform's social media component functions as expected, allowing users to create posts, comment, like, and share posts with other users. The platform's NFT marketplace component was also tested, and it was found to function correctly, allowing creators to mint their posts into NFTs by paying a mint fee.

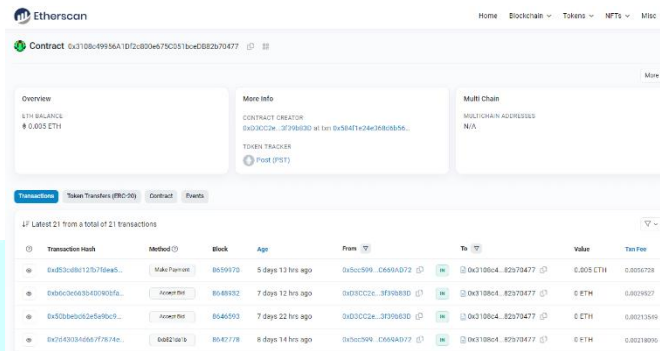


Fig – 4: Etherscan Smart Contract Tracking

Etherscan is used to verify the smart contract. With Etherscan, the application's transactions can be monitored. As a result, the platform is more trustworthy and transparent. Here, you can also verify the NFTs' ownership and identity.

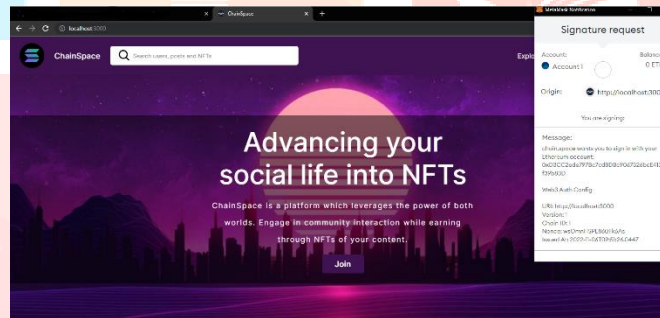


Fig – 5: Web3 Auth using MetaMask

The authentication of the platform is done through Web3 wallets. This enables a one-click login feature. The same wallet is used for performing transactions related to NFTs.

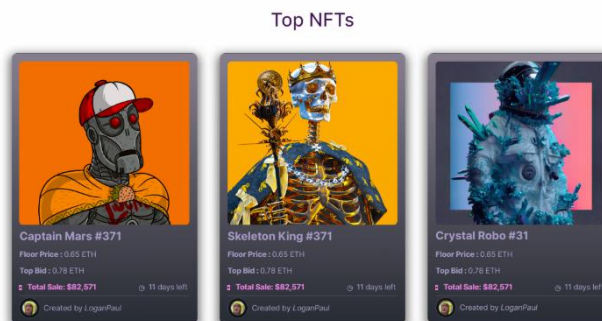


Fig – 6: NFTs minted through the platform

The tests also demonstrated the platform's scalability, with the ability to handle a large number of users and transactions without compromising performance or security. The platform's security was also tested, and it was found to be secure, with the use of smart contracts providing a high level of protection against fraudulent activity.

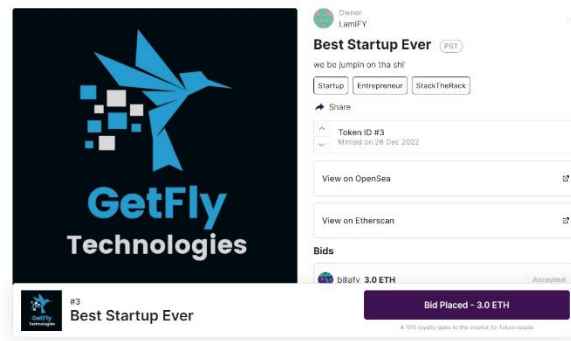


Fig – 7: NFT Bidding

The NFTs are stored on the Ethereum blockchain network. As a result, the NFTs created on this platform are also automatically listed on all other Ethereum-based NFT marketplaces, like OpenSea. OpenSea is one of the largest NFT marketplaces, with thousands of daily active users and millions of dollars in daily trading volume. By integrating with OpenSea, the decentralized social media application could tap into this existing user base and potentially reach new audiences interested in buying and selling NFTs.

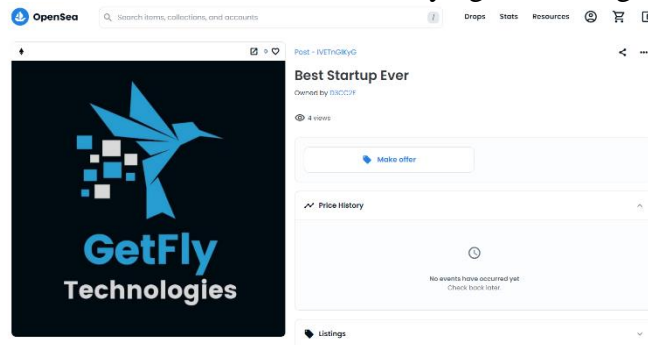


Fig – 8: NFTs on OpenSea

Overall, the results demonstrate that the proposed decentralized social media application with an integrated NFT marketplace is a practical solution for creators and users looking for a decentralized, secure, and flexible platform to interact and monetize their content.

## IX. FUTURE SCOPE

As decentralized social media applications with NFT marketplaces continue to evolve, there are several future features that could enhance the functionality and usability of these platforms. Here are some potential future features based on user feedback and current trends:

### A. Advanced NFT creation tools

Offering advanced NFT creation tools could enable users to create more complex and sophisticated NFTs. This could include features such as 3D modeling, animation, and augmented reality components, which would make NFTs even more valuable and unique.

### B. Virtual events

Finally, virtual events such as conferences, exhibitions, or auctions could be a powerful way to bring users together and generate interest in the NFT marketplace.

In summary, by implementing these features, developers can create a more engaging, valuable, and sustainable ecosystem for users.



## X. CONCLUSION

In conclusion, decentralized social media platforms and NFT marketplaces have gained popularity in recent years due to the growing concerns over privacy and security on traditional social media platforms. The integration of NFT marketplaces with social media platforms provides creators with a new revenue stream and the ability to monetize their content. The proposed decentralized social media application with an integrated NFT marketplace provides a new approach to social media that is more transparent, secure, and monetizable for creators. The platform's architecture is decentralized, which ensures users' control over their data and content.

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