

Decentralized Social Media Application with NFT Marketplace

Dr. V. Ceronmani Sharmila

*Department of Information Technology, Hindustan Institute of Technology and Science,
Chennai, India*

csharmila@hindustanuniv.ac.in

Hrithik S Raj

*Department of Information Technology, Hindustan Institute of Technology and Science,
Chennai, India*

hrithik1@gmail.com

Stephin T

*Department of Information Technology, Hindustan Institute of Technology and Science,
Chennai, India*

stephint07@gmail.com

Venkatapathi Raju. P

*Department of Information Technology, Hindustan Institute of Technology and Science,
Chennai, India*

rajupakalapathi45@gmail.com

Abstract

Social media is always a threat where the data is being stored in a centralized database. Although there are different ways of protecting the data even though there are several numbers of possibilities for being attacked like eavesdropping, Man in the Middle attack, Account takeovers through various attacks. In Many Countries social media and their chats and their activities are getting tracked by the government. We Present ASFALIS, A Decentralized social media application with Realtime chat Dapp which ensures decentralization, Rigid, censorship resistance, and data security.

The data will be stored inside of the blockchain and create a global copy of the data in each node. Only authorized users can access those data by swapping the private key on the blockchain. There is no need for trusted intermediaries here and the whole system is decentralized. Asfalisis consists of its Own NFT Marketplace which allows the users to commercialize their works or creativities in the form of NFT and also, they can mint and put up their NFT as the profile pictures in ASFALIS.

Keywords: *Social media, Decentralized Chat system, NFT Marketplace, Security Concerns, Privacy.*

1. Introduction

Next-generation connection makes extensive use of social media network

Indeed, this preceding's resulted in the recent shift from the infotech age to the SM era, and now to the just announced SM 3.0 era [1].

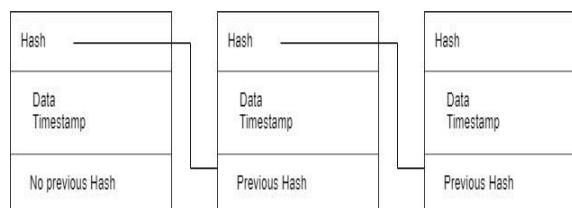
They can influence communication patterns, trade and economic activities, as well as production, learning, and knowledge acquisition. The majority of social media platforms are centralized. [2] The network is managed by a single proprietary entity, raising serious concerns about trust and governance in the process content that has been disseminated.

This is a concern when there are data breaches. common occurrence at the hands of centralized intermediaries, necessitating novel user-level solutions (i.e., consumers, prosumers, and enterprises), as well as the underlying social environment and a media ecosystem that Provides global reach and decentralized ownership and control media [3].

We are watching many social media applications coming out frequently daily but the uniqueness of ASFALIS is all the data will be stored inside of the blockchain and the complete system is Decentralized and the users can mint their own NFT. By this the individual can be able to use his hidden talent or the personal interest and commercialize it by selling them in the NFT marketplace.

It ensured the integrity of the data and secure communication between the two ends. No third party is being involved in the transaction. All the users should reach consensus for the transaction in a secure way. And the records cannot be altered. Attacker won't be able to manipulate or do anything with the data because he should gain access to all the computer in the network that' the blockchain database is hosted, and that's impossible. The data can be encrypted in a way that is impervious to the attacker.

Fig1: Continuous sequence of blocks in blockchain



2. Related Works

The article “Seok Won Seong, Jiwon Seo, Mathew Nasielski (2010) “PrPI: a decentralized social networking infrastructure” decentralized infrastructure that enables individuals to involve in social networking websites while maintaining privacy over their data. The Butler can be run on a user's server rather than through a commercial or image provider of his choosing.[6] Each Butler offers data storage confidentiality; it keeps a semantic reference to data that might live, presumably encrypted, in these other storage systems. It uses, decentralized OpenID management solution, which allows users to access the material.

The advancement of Ether blockchain technology has greatly impacted the network, allowing numerous applications to be dispersed and decentralized while increasing safety. Because they are built on the decentralized EVM and its smart contracts, bitcoin and ether apps are sometimes referred to it as DApps [7].

The Ether VM is a blockchain platform that is open source and offers an execution environment for smart contracts (EVM). Decentralized Apps are widely used to describe Ether-based applications since they are built on the decentralized EVM and its smart contracts [8][12].

The Non-Fungible Token (NFT) industry has a rapid growth in recent years. NFT is built on an Ether currency standard that tries to differentiate each token using indications that can be identified easily. This sort of token can

be connected with digital assets as their identifiers which are unique. [7] All indicated are allowed freely sold via NFTs. With bespoke differs depending on It has accelerated the market growth in the region very remarkably for DApps [8].

2.1 Objectives of the Study

To Ensure the Data Security and Privacy in social media by implementing Blockchain Technology in social media. The ASFALIS comes with a Decentralized chat where all the data is being stored in the Ethereum blockchain where the user needs the private key for accessing the data. The ASFALIS comes with a NFT Marketplace where the user can mint, buy and sell their own NFT'S.

ASFALIS will be the first Decentralized Social Media Application with Chat and an own NFT Marketplace altogether. So, by this we encourage Cross-platform Application culture which is new and interesting to use [9].

3. Conceptual Framework

This conceptual framework consists of

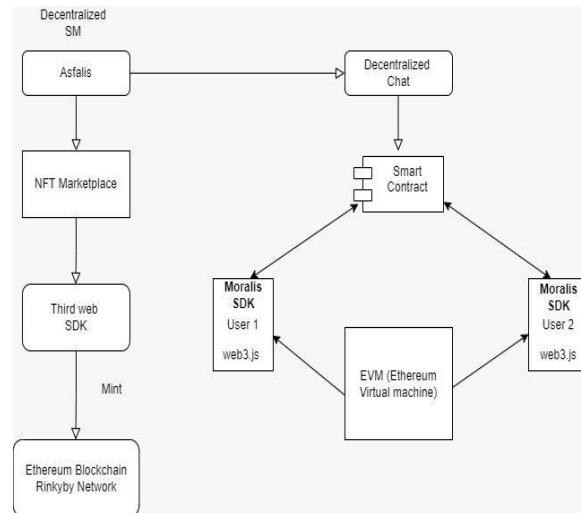
- 1.System overview
- 2.Content Accessing model

3.1 System Overview

This model consists of 3 blocks social media, Decentralized chat app, NFT market place. The UI of the application is built using React.js, Next.js, Tailwind CSS. We are using Third Web SDK for integrating the application with the Ethereum Blockchain (Rinkyby Network). [10] ASFALIS then connected to the Decentralized chat application where the user needs to get authenticated again using the Metamask ID. The User-Interface is being built with the same Technologies used above and it is powered by the Moralis 3.0 Server. User can navigate into the NFT Marketplace from the ASFALIS. [11] The ASFALIS works in a way

that the data will be stored into blockchain in an Off-Chain Way.

Fig 2: A sketch depicting the conceptual framework



3.2 Content Accessing model

ASFALIS works in a way that the user needs to Log in using the Metamask Authentication and he will be directed into the social media. There the user can post the content. And all the data is being saved into the Ethereum Blockchain Network. The user can mint their own NFT from the ASFALIS Dashboard and he can put it as a Profile Picture. It acts a Gateway for the NFT Marketplace and the Chat.

Fig 3.2.1: Login authentication using meta mask for Asfalid social media.

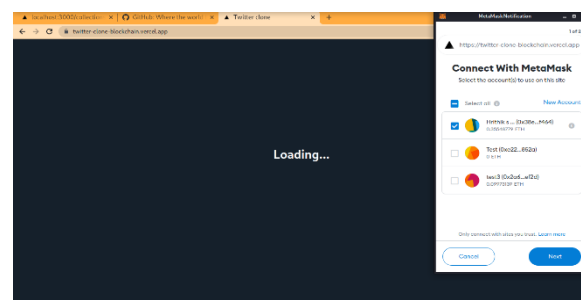
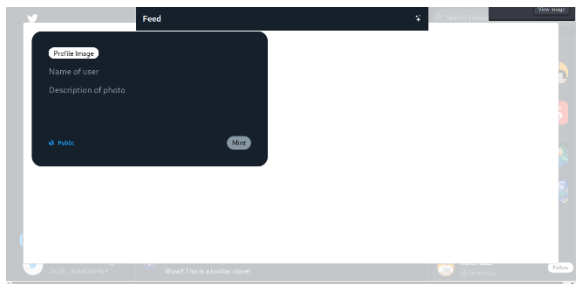
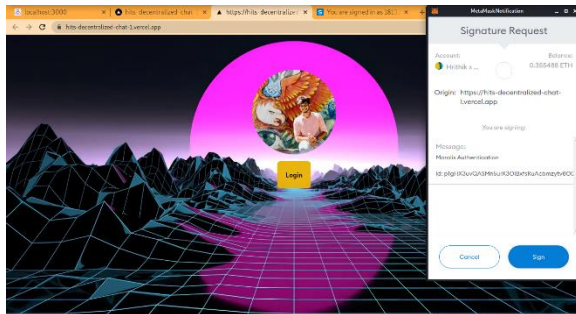
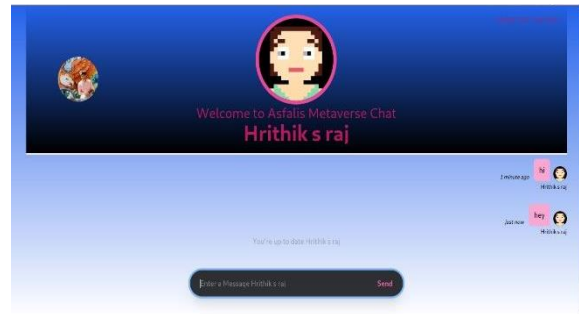


Fig 3.2.2: Dashboard for Asfalıs.**Fig 3.2.3: UI for minting profile picture as NFT**

From the ASFALIS the user can Navigate into the Chat where he will be authenticated using the Metamask-ID. Where the users can chat with each other in a secured environment. Only the user with authorized private key can be access the data and there is no point of any breaches, or any attacks.

Fig 3.2.4: Authentication of the decentralized chat.**Fig 3.2.5: Decentralized chat interface**

The NFT Marketplace can be accessed from the ASFALIS Dashboard with the user will be authenticated using Metamask. There the user will be navigated to the NFT Marketplace Where he can go into the Collections for buying the NFT'S and The user can mint their own NFT using Third web SDK and put it in the marketplace.

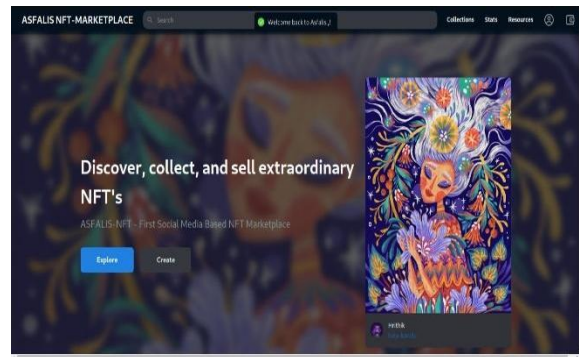
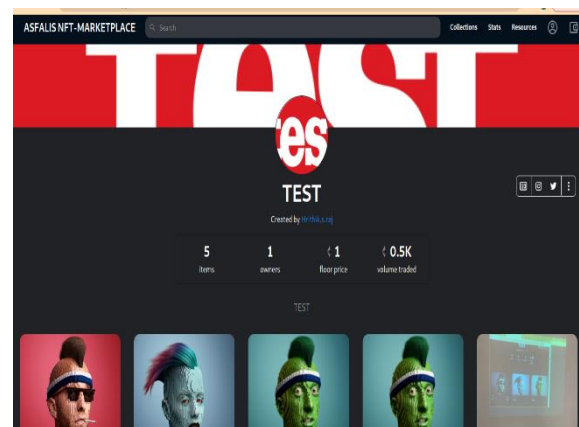
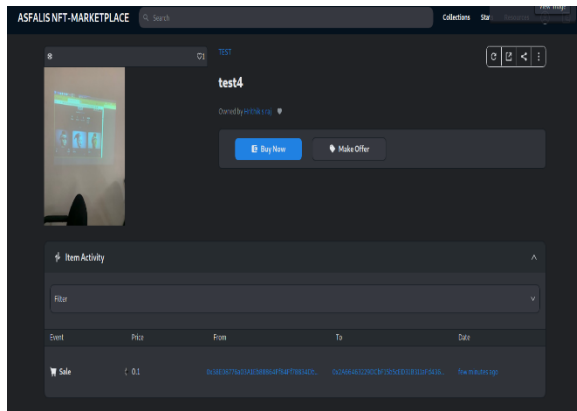
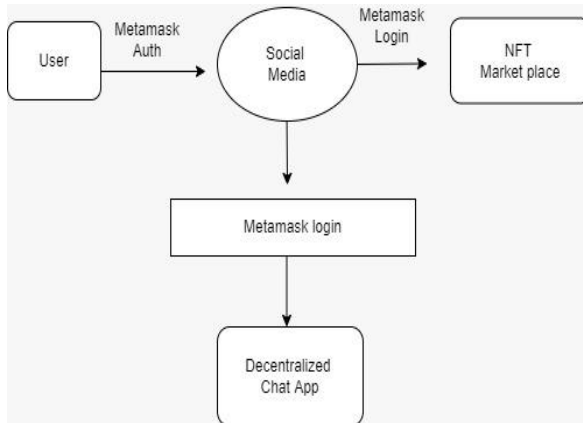
Fig 3.2.6: Authentication of NFT marketplace**Fig 3.2.7: NFT marketplace interface.**

Fig 3.2.8: Travel history of an NFT.**Fig 3.2.9: Pathway showing the process of Accessing the application**

4. Methodology

The task of combining social media, decentralization and NFT market place has never done before and selecting a particular method to this has been a quite tougher task. The process includes Designing an application that has the features of social media applications of present trend and making it decentralized by keeping the user data highly secure. Along with this we will add NFT module to this which is accessed by only through the individual meta mask Id. Combining all these modules on a single threaded platform will be something new and interesting and the users will experience a productive way of using social media as it adds a new perspective of showcasing of individual talents. As we all know that meta is owning the

social media giant like Facebook, Instagram and WhatsApp and they are maintaining a closed environment with a connection between three applications. So, we also want to make ASFALIS a platform that involves a secure environment with a unique feature and the different style of presentation. So here in ASFALIS We have a Decentralized social media with Chat along with a module for NFT marketplace. So, the method we have chosen is to keep everything inside a blockchain and make it encrypted at every end possible there by reducing any kind of breaches and attacks that may lead to some devastating scenarios. For logging in to the Asfalis application we need a Metamask id. So that the user won't be in a fear of losing or being his data stolen.

All the modules involved in this application building process are made with a will for strong and secured social media experience added with a productive NFT module for commercializing the individual works.

The analytic Dashboard helps the users to analyze the trends in NFT marketplace and we are using Connecting Dominating Set Algorithm for getting the Analytics for the NFT'S. Therefore, they will get a clearcut idea before buying or selling any NFT. Here taking the price, popularity and some other minor things as factors and basing these factors we are building the analytic dashboard. The analytics play a major role in investing platforms and some other platforms now a days. So, the analytic while designing analytic dashboard we need to consider some important factors as they play major role in turning trends and markets all the way. So, in future there may be some factors may add or some may lose based on the trend we need to add or reduce factors and may be sometimes redesigning also required.

5. Connected Dominating Set Algorithm

In a connected graph, a connected dominant set G is a dominating set in G whose vertices induce a connected subgraph, that is, one in

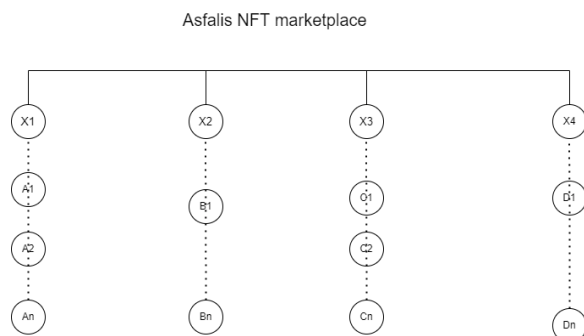
which no dominating vertex is not connected to another by an edge. As a result, all connected dominating sets in a graph are a subset of all dominating sets.

A graph's dominating set with the fewest connections. G is a connected dominating set of the smallest possible size, with $d(G)$ as the connected domination number. We are going to add the CDS Algorithm in the NFT Marketplace for generating the Analytics of the NFT Transactions and the Holdings.

6. Results and Analysis

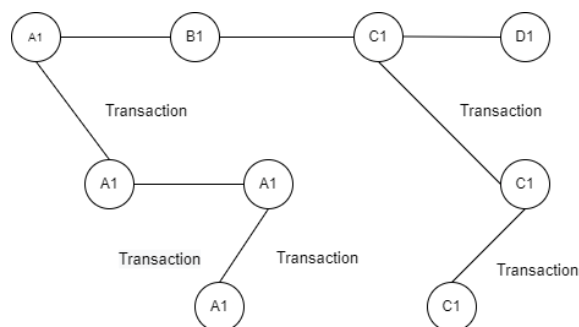
For the implementation of the dashboard for analytics of NFT we have used CDS algorithm and its Results are shown as below

Fig 4: Depiction of Asfalit NFT marketplace



Here in Fig 4 X1-Xn are the collection of NFT in the market place. Where A1, B1, C1, D1 are the NFT'S in the collection.

Fig 5: The transaction(travel) history of collection of NFT depicted using CDS algorithm.



A1 NFT undergoes 3 Transactions which is tracked by CDS and C1 Had 2 Transactions. B1 and C1 doesn't undergo any transactions.

The CDS tracks the record of the Transactions happened over the NFT'S.

Fig 6: Representation of Number of transactions(hopping) each node (NFT) has travelled.



Fig 7: Transaction history of A1 NFT which underwent 3 transactions.

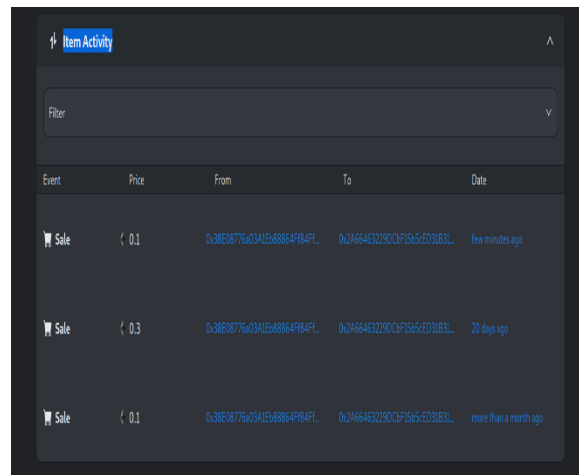
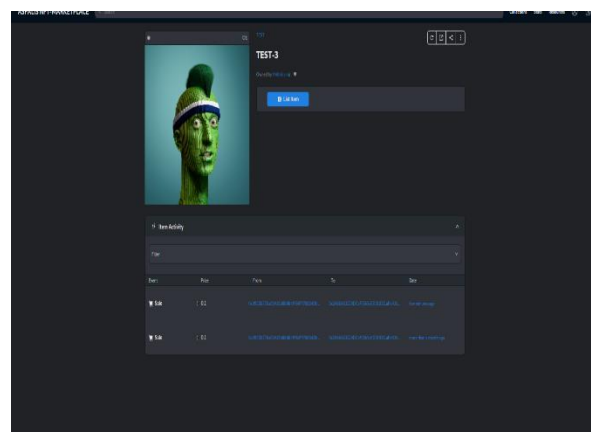


Fig 8: Transaction history of C1 NFT which underwent 2 transactions

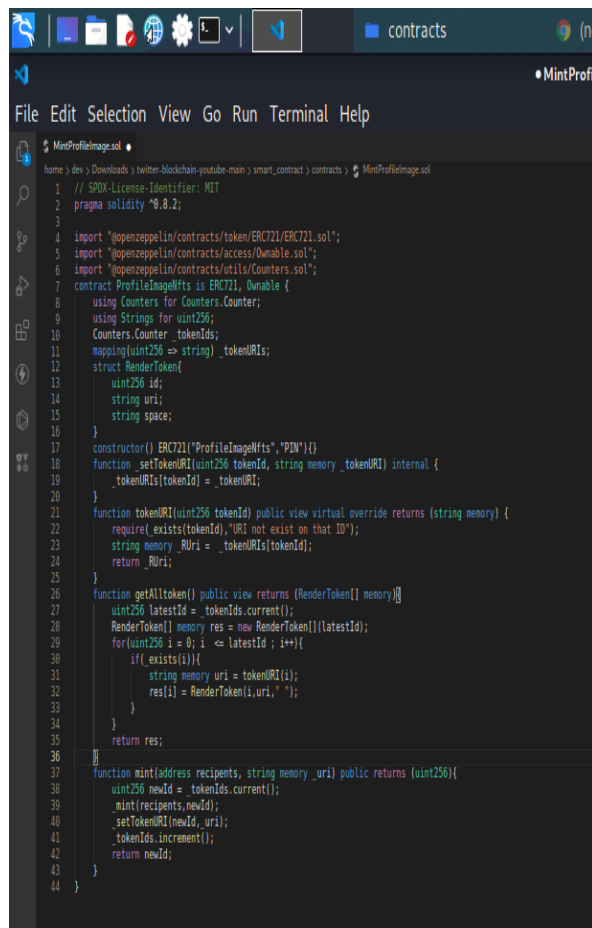


The Analytics of the NFT'S is being tracked by the CDS and the number of transactions held for each NFT'S is being listed above. It also

includes the Floor price, number of owners that the NFT had, Current Price and by using the insights which is getting from the CDS the analytics is taken and it's listed in the Dashboard of each NFT in the Asfalit NFT Marketplace.

Smart contract for minting profile picture as NFT

Fig 9: Smart contract for minting NFT written in solidity using ERC721 token.



7. Conclusion

It can be concluded from the study that this application ASFALIS will be one of the innovative ideas of combining various cultures of web 3.0 like social media, chat and NFT in a decentralized environment. Providing a productive social media experience with an assured secure environment and without any

kind of data breaches is the main objective and motive behind this idea.

Finally at the end of the day a social media is treated as a time killer so we are trying to give a productive space in social media for commercializing the talents and making it somewhat useful and create some positive opinion towards it.

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