Blockchain-Based Social Networking Model Empowered by Non-Fungible Tokens

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ABSTRACT

The increasing reliance on the internet has escalated the frequency and sophistication of cyber threats, making timely identification and mitigation essential. This research presents an AI-powered framework for cyber threat detection and profiling using Natural Language Processing (NLP) and Machine Learning (ML) techniques. By utilizing Twitter as an Open Source Intelligence (OSINT) platform, the system collects real-time threat intelligence, classifies threats, and maps them to the MITRE ATT&CK framework to provide actionable insights. Key processes include data preprocessing, feature extraction using advanced NLP models, and threat profiling to assess intent, origins, and potential impacts. The automated approach reduces analyst workload, enhances accuracy, and accelerates response times, addressing the limitations of manual threat analysis and noisy data sources. This framework aims to advance proactive cybersecurity by delivering real-time, context-aware threat intelligence.

Keywords: Blockchain, Non-Fungible Tokens(NFTS), InterPlanetary File System(IPFS), Social Networking, Online Social Networks, Decentralization, Data Ownership, Content Monetization, Reputation Sytsem, NFT Marketplace, Digital Ownership, User Autonomy, Data Privacy, Security, Digital Rights Management(DRM).

I. INTRODUCION

The contemporary digital era is characterized by the pervasive use of social media platforms, which have become integral to how individuals connect, share information, and engage with the world. Users leverage these networks for a diverse array of activities, including maintaining relationships, staying informed about current events, seeking entertainment, professional networking, self-expression, business promotion, and participating in online communities. This widespread adoption is driven by features like constant accessibility, on-demand services, established friendship networks, and effective user engagement tactics such as recommendation systems.

However, the prevailing models of online social networks (OSNs) are not without significant drawbacks. These include the centralization of power, a lack of genuine data ownership for users, weak access control mechanisms, the spread of misinformation and fake news, the prevalence of automated bot accounts, censorship, and persistent issues with digital rights management. To overcome these challenges, a fundamental re-evaluation of social networking architecture is required.

This paper introduces a blockchain-based social networking model designed to address these limitations. A core innovation is the ability for users to convert their posts into Non-Fungible

Tokens (NFTs), providing a direct avenue for content monetization. The system employs the InterPlanetary File System (IPFS) to ensure decentralized storage of user data. Furthermore, the research details algorithms for all platform functionalities and proposes a novel system for calculating reputation scores for both users and their content, aiming to foster a more trustworthy and equitable online environment.

II. MODULES

A. SERVICE PROVIDER

It is designed to deliver social networking capabilities, enable content monetization through Non-Fungible Tokens (NFTs), and manage decentralized data storage for its users. The platform, as conceptualized and proposed in the paper, is what offers these services, shifting from traditional centralized entities.

B. VIEW AND AUTHORIZE USERS

The "Admin" module oversees user access. It allows administrators to view all registered users and manage incoming "User Requests." Prospective users submit these requests for registration; the Admin then reviews and, upon approval, authorizes their access to the social networking service.

C. REMOTE USER

The "User" module represents individuals who access the social networking application remotely. They engage by registering (with admin approval), logging in, uploading content (which can become NFTs), and interacting with posts (e.g., liking or rating). These users are the main participants in the decentralized social environment.

EXISTING SYSTEM

Current online social networks (OSNs) are deeply embedded in the digital lives of most people. Individuals utilize these platforms for a wide array of purposes, including maintaining connections with friends and family, obtaining news and information about events, entertainment, professional networking, personal expression to broad audiences, business promotion, and participation in diverse online communities and activities. The popularity of these platforms is fueled by features like widespread accessibility, immediate service availability, established social connections, and engagement tools such as content recommendation systems. The underlying architecture of these social networking applications typically relies on centralized data centers, often employing access-controlled or subscriber-publisher models to manage user interaction and content consumption.

DRAWBACK

- Centralized Control
- Lack of Data Ownership
- Security and Privacy Vulnerabilities
- Content and Integrity Issues

PROPOSED SYSTEM

Storage to address limitations of current platforms This system proposes a social media application where user posts can be converted into Non-Fungible Tokens (NFTs) for sale. It utilizes Inter Planetary File System (IPFS) for decentralized

A. PROPOSED APPROACH

STEP-1: Develop a social media application with its core functionalities.
STEP-2: Implement a mechanism to convert every user post into a Non-Fungible Token (NFT).
STEP3: Enable the sale of these NFTs, allowing users to earn money.

STEP-4: Integrate the Inter Planetary File System (IPFS) as the decentralized storage solution.

STEP-5: Propose and implement algorithms for all application functionalities, including a reputation score system for users and their posts.

ADVANTAGES

- Offers low latency in its operations.
- Significantly enhances the real-time experience and satisfaction for users.
- Benefits from geographically distributed edge computing nodes.

B. MACHINE LEARNING MODELS USED

1. Reputation Algorithm – Calculates user and post reputation scores.

2. Fuzzy Logic – Handles diverse data using linguistic variables and trapezoidal membership functions.

3. Decentralized Identity Algorithm – Filters users and images based on ratings and social links.

4. Recommendation System – Suggests content based on upload history, social influence, and creator admiration.

5. Smart Contract Logic – Manages secure NFT transactions and user operations.

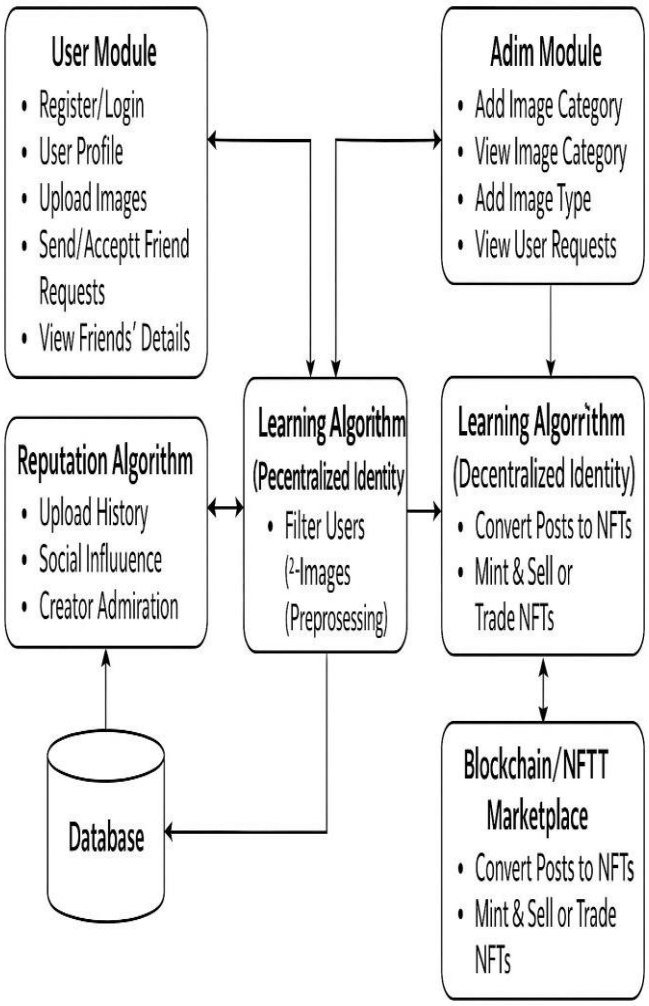

Fig.1.Proposed System

C. WORKING

1. Decentralized Platform – Uses blockchain to avoid central control and improve data privacy.

2. NFT Posts – Users can convert posts into NFTs and sell them.

3. Reputation System – Scores users/posts based on interactions to promote trust.

4. IPFS Storage – Stores media in decentralized file system for better security.

V. RESULT AND IMPLEMENTATION

Fig.1.

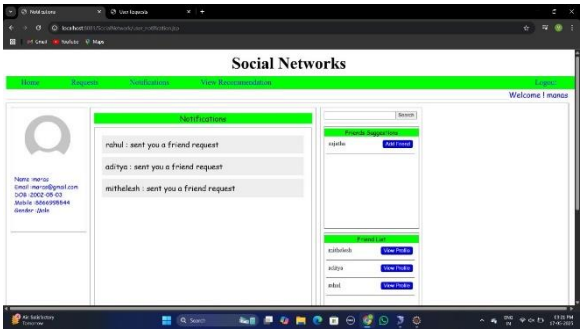

Fig.2.

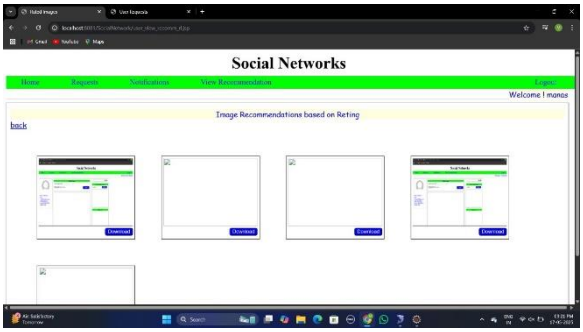

Fig.3.

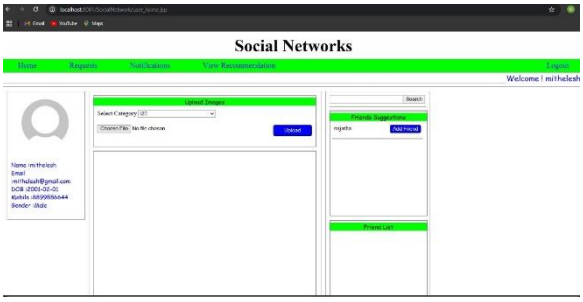

Fig.4.

VI. CONCLUSION:

The project successfully presents a decentralized social media platform using blockchain, NFTs, and a reputation system. It enhances user privacy, content ownership, and monetization while reducing the risks tied to centralized systems.

VII. FUTURE ENHANCEMENTS

To enhance the platform, future work can focus on improving scalability through Layer 2 solutions, developing a mobile application for better accessibility, and refining the reputation system using AI. Cross-chain NFT support can expand user reach, while incorporating legal compliance features will ensure the platform aligns with global regulations.

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