

Decentralised Social Media Application

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Abstract- Online social networks are becoming more and more prevalent in people's life, but they face the problem of privacy leakage due to the centralized data management mechanism. Evolvement of blockchain technology has greatly changed the network and it makes many applications to be distributed, decentralized without loss of security. Ethereum is an open-source blockchain platform that provides a runtime environment for running smart contracts, which is called Ethereum Virtual Machine (EVM). Ethereum-based applications are usually referred to as Decentralized Applications (DApps), since they are based on the decentralized EVM, and its smart contracts. By combining smart contracts, we use the blockchain as a trusted server to provide central control services. Blockchain helps us incentivise users of the platform with cryptocurrency as a reward for moderation. This is a decentralised application based on Ethereum blockchain built using solidity and react. In this paper, we examine how blockchain and incentivisation can enable more functionalities of traditional social network systems. Social media has transformed the mode of communication globally by providing an extensive system for exchanging ideas, initiating business contracts, and proposing new professional ideas. However, there are many limitations to the use of social media, such as misinformation, lack of effective content moderation, digital piracy, data breaches, identity fraud, and fake news. In order to address these limitations, several studies have introduced the application of Blockchain technology in social media. Blockchains can provides transparency, traceability, tamper-proofing, confidentiality, security, information control, and supervision. This paper is a systematic literature review of papers covering the application of Blockchain technology in social media. To the best of our knowledge, this is the first systematic literature review that elucidates the combination of Blockchain and social media. Using several electronic databases, 42 related papers were reviewed.

Index Terms: blockchain technology, decentralisation, Ethereum, smart contract, social media , online network sites; application of blockchain.

I. INTRODUCTION

Social media invoke digital platforms reachable by the internet and permit users to form and interact in virtual groups. People can easily share information, which greatly strengthens communication and contact. They can find old classmates and acquaintances, connect with novel groups, or find persons with similar attractions across political, financial, and geographic boundaries. Thus, social media enable millions of internet users around the world to exchange information. They deliver access to a massive data source on an incredible ratio [1–3]. However, there are certain limitations to social media. Academics, officials, and users have recognized several crucial problems, including massive control by limited firms, the publication of false content, discussions around restricted or unrestricted dialog, compromised confidentiality, and political restrictions [4]. Using private details on social media increases apprehension with respect to confidentiality and involves security issues. Netizens face considerable exposure to several kinds of attacks in light of the variety and particularity of the private materials exchanged on different sites [5]. Netizens can be exposed to a loss of privacy and control over their personal information. It is inexpensive to deliver news over a network, and quicker and simpler to distribute it via social media; large amounts of bogus content with deliberately incorrect articles form online for a variety of reasons, including to obtain economic and political advantage [6]. Researchers have discovered that fake articles are disseminated more quickly on Twitter than factual content by a considerable margin, that fallacious content is 70% more likely to be retweeted on Twitter than trustworthy content, and that it influences the first 1500 users six times as quickly [7]. These societal issues pose a substantial challenge in contemporary times. Our findings show that previous studies on the applications of Blockchain in social media are influenced.

II. LITERATURE REVIEW

A number of previous and current works have been working on developing decentralized applications with the use of IPFS or Swarm as distributed data store. We will discuss several applications that make use of these technologies and also work that we have been referring to for insights on development of DApps.

A. AKASHA project Akasha [6] is another social media application developed using Ethereum and IPFS on dedicated blockchain. The Akasha team has found a suitable technology stack to implement a decentralized and distributed Internet after a lot of study and prototyping work. The cornerstones of the Akasha stack are IPFS and Ethereum, augmented by React with Redux, Node.js, and Electron. The Akasha project provides a guideline of how social media applications can be built with the merits of the blockchain system.

B. DesignCourse They have provided detailed explanation on how to build a decentralized application with the use of Ethereum platform, web3.js library and ReactJs as the frontend. This provides a brief understanding of how these components can come together to build a successful DApp. Meanwhile, they also provide explanation for other concepts including IPFS system which is currently used in the social media application in this paper. They provide a lot of insights and tips on setting up a private blockchain and make the entire DApp works at a ready state

B. Social Media, Content Moderation, and Technology This paper develops a theoretical model to study the economic incentives for a social media platform to moderate user-generated content. The optimal content moderation strategy differs for platforms with different revenue models, advertising or subscription. They provide a platform's content moderation strategy depends on its technical

III. PROPOSED SYSTEM

Advances in Blockchain and distributed ledger technologies are driving the rise of incentivized social media platforms over Blockchains, where no single entity can take control of the information and users can receive cryptocurrency as rewards for creating or curating high-quality contents. Once the application is deployed on the blockchain, the network as a whole will always be able to serve clients looking to interact with it, which means zero downtime.

On one hand, traditional social media's popularity is increasing exponentially due to the heightened marketing and entertainment experience it offers to its users. However, on the other side, there are rising concerns over the data and privacy breaches to which these platforms are often associated.

Blockchain social media, with its decentralized and distributed networks, offers a plausible solution to such issues. Among other things, they enable users to assert greater control over their data.

WALLETS

Simply put, Web3 wallets are a way to use hardware or software not only to access funds, but to effortlessly allow you to interact with decentralized applications, serve as a gateway to bankless financial services, collect NFTs [7], create on-chain identity, collaborate with communities, and provide substantially more use cases beyond the scope of the traditional wallets we have today.

Just like how people have a physical wallet to store paper money, these wallets help store access to your digital currency instead. In addition, Web3 wallets are capable of storing digital assets such as NFTs and enable users to interact with Decentralized Apps (dApps). This is done all without the necessity of a middleman involved.

Wallets don't actually store the cryptocurrency, but they store the information required for access to your funds which are digital cryptocurrencies.

GAMIFICATION AND EXTRINSIC MOTIVATION

In the era of goldfish-like attention spans, user experience designers are turning to gamification to retain and incentivize users. Virtual swag such as badges and stickers can help increase the stickiness of a product. Badges introduce a sense of competitiveness among users, persuading them to level up and unlock the next badge. This will help to deter mindless low-quality posting simply for the purposes of challenge completion. The culture of a social network is set from the very beginning, so it's imperative early challenges cultivate the right environment. This gamification element creates many mutual benefits to both the platform and the user. Challenges can be set to reward content creation, post engagement, labelling content, expanding networks, curating profiles, expanding the user base and moderating the site. This will be particularly useful in early phases of growth to provide some intrinsic value to the platform while the user-base is low.

Points serve as indicators of achievement and progress. Points can reward users with status (if used to rank users against each other) or they can offer tangible rewards (for example, when converted to in-app currency or free items as part of a loyalty scheme).

Badges primarily serve to recognize a user's accomplishments. Badge systems in many apps and games also help align users to shared goals while acting as virtual status symbols, distinguishing badge-holders from others.

IV. METHODOLOGY

The detailed methodology of any systematic review should be fully reported in order to facilitate better understanding of the authenticity and availability of the review's results. In order to assist in the complete and transparent reporting

of systematic reviews, researchers have developed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) to explain the methods and terms in system reviews of the latest research progress [44]. We follow the PRISMA methodology in this study. A systematic literature review aims to synthesize scientific research on an explicit subject through accurate analysis of past and present studies. This systematic literature review includes the standard steps: abstract, introduction, methods, results, and discussion.

This study covers all the characteristics of a usual systematic review: a clear title and clear purpose; a comprehensive retrieval strategy; clear inclusion and exclusion criteria; a list of all selected studies; evaluation of the characteristics of each selected study and the quality the research methodology; systematic reporting of research results; and assessment of the possibility of any publication bias.

4.1. Eligibility Criteria

Below, we lay out the inclusion and exclusion conditions used for this review and how studies were gathered for synthesis.

4.1.1. Inclusion Criteria

Blockchain and social media are recent fields of inquiry, and studies have only emerged in recent years; hence, publication date was not used as an eligibility criterion. However, papers were included in this SLR if they satisfied the criteria below:

- Papers published in journals or conference proceedings, as these are much better indexed in scholarly databases and are easier to find;
- Papers written in English;
- Papers containing the following keywords: (“Blockchain” OR “Blockchain platform” OR “Blockchain application”) AND (“Social media” OR “Social network” OR “Social platform” OR “Online community” OR “media platform”);
- Papers must have proposed methods to resolve an issue in social media by applying blockchain to improve privacy and security or have proposed a model using one of the characteristics or components of blockchain.

4.1.2. Exclusion Criteria

The review excluded:

- Reviews, reports, case reports, abstract-only papers, patents, magazines, and editorials, as well as books, dissertations, and theses, all of which are hard to find and infrequently available online;
- Papers for which the full text was not available online;
- Papers with a title and abstract not explicitly related to both blockchain and social media.

4.2. Information Sourcing

The next step in our research approach was to determine the online databases and internet materials to be used data collection. We chose eight highly relevant sources by researchers in computer technology-related fields. A final search was carried out on 5 April 2022. The databases we used were

4.3. Search Strategy

The search methodology is fundamental for any systematic review. The determination of search terms is the second phase. We first defined a search term relating to our study topic; second, we described alternatives for the terms and similar theories. One of the keywords we used was “blockchain”, along with the associated terms “blockchain platform” and “blockchain application”. The other key term was “social media”, along with the associated terms “social network”, “social platform”, “online community”, and “media platform”. Appl. Sci. 2022, 12, 6567 8 of 25 The search strings were built by combining the keyword with the connectors “AND” and “OR.” Each database uses its own search syntax; thus, different query and search strings were constructed, as illustrated in Table 1. An identifier is a symbol used to categorize an object. It has various senses in different application situations and is used to specify a thing or a person in daily life. Certain identifiers are persistent (PID, persistent identifier); these include long-lasting references to a file, web page, or other digital objects. Most of them have a unique identifier related to the current address of the metadata or content. Currently, two varieties are frequently employed, those for things (journals, information, or software, such as URN, DOI, ARK, and Handle) and those for persons (academics, authors, or contributors, such as ORCID and ISNI). ORCID (Open Researcher and Contributor ID) is an international, interdisciplinary, and open non-profit organization established in 2010 to deliver services. A blockchain network is restructured through the arrayed consensus protocol in order to certify that contacts and blocks are organized correctly, to guarantee the distributed ledger’s integrity and consistency, and ultimately to enhance trust between nodes. Proof of Stake (PoS) represents an alternative to PoW, as it is more energy efficient; it utilizes a collection method that is pseudorandom in order to choose the validator of the following block from among the current nodes.

V. CONCLUSION

One of the most substantial changes in communication services in the 21st century has been the expansion of social media. These new communication channels have refined many of the contemporary world’s most dominant instants and facts. Traditional social media services are entirely centralized. They hold all information, control customer

navigation, and control anything on their networks. This has significant repercussions for confidentiality, restrictions, and regulation, and concerns about this and many other problems have prompted requests for networks to reform their functionality and service models. Furthermore, whether anything whatsoever results from these concerns, it will likely only occur much later. Many studies combining blockchain with social media are trying to fix the problems of privacy and safety alternatives in social media. This paper presents a detailed review of the existing literature using a systematic literature review process; based on this context, the current state of blockchain applications in social media is discussed. Our research aims to analyze the different models proposed in this domain. We report on several different models and techniques. We found that the models proposed are based mainly on certain characteristics and components of blockchain technology, particularly smart contract, consensus mechanisms, and decentralization. We found several studies that combined Blockchain with artificial intelligence and machine learning. The two main issues drawing the attention of researchers were data privacy and fake news. Blockchain provides solutions to several challenges in social media; however, certain obstacles to this application, such as scalability and storage capacity, affect the ability of blockchain and social media applications to work together efficiently. More research must be completed in this domain in order to make these two technologies work efficiently together. In our future work, we plan to test several existing consensus protocols for their use in social media.

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