STUDY ON BLOCKCHAIN IN WEB 3.0

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Abstract

Web 2.0 today is all about bringing people together. which saw the creation of social media platforms and a concentration on application layer development There are various ways to think about web 3.0; some believe that the semantic web is what the future holds, while others believe that the virtual web is what the future holds. This essay will discuss the decentralized web, another way to view the web of the future. The decentralized web is concentrated on creating protocols and the underlying technology that end users are not aware of. This essay provides a general summary of the difficulties facing present Web 2.0 explains the decentralizedweb and the technologies that are currently in development.

Keyword: *Blockchain technology, decentralized, web3.0 evolution, social, economic,internet, data, future, database.*

1. INTRODUCTION

Blockchain has made the web a better network for collaboration, communication, and content creation. This development in the internet offered many benefits, but it also created many issues that need to be resolved, such as the loss of democracy brought on by the centralized storage of data. As we are gathering enormous amounts of data in one location, there are issues with internet filtering and security risks. There were no protocols that supported the decentralization of data prior to the development of blockchain networks. As a result, all of our data is gathered and owned by large-scale platforms. The decentralized web will find a solution to this issue. Additionally, the token mechanism will ensure that investors contribute to the creation of protocols.

This paper will provide a general review of blockchain in Web 3.0, including its features, difficulties, and potential applications. Public blockchains, a database best known for facilitating bitcoin exchanges, are the foundation of Web 3.0, a potential future version of the internet. Web 3.0 is intriguing because it is decentralized, which implies that consumers own and control some areas of the internet rather than using services that are mediated by

companieslike Google, Apple, or Facebook.

The evolution of Web 3.0

Web 1.0 - Web 1.0 refers to the initial iteration of the internet. In Web 1.0, static content was distributed via websites as opposed to dynamic HTML.

Web 2.0 - Most of us are only familiar with the web's most recent incarnation, often known asWeb 2.0, the interactive read-write web, and the social web.

Web 3.0 - Web 3.0 is the third iteration of the internet. It uses blockchain technology to providethe internet supported by decentralized networks.

Figure 1: The Evolution of Web 3.0(Source: Analytics Vidhya)

2. LITERATURE REVIEW

Msc. Héctor E. Ugar, 2017 The Semantic Web has been said to be completed with Linked Data. The Semantic Web is still only a pipe dream, but a homogeneous revolutionary platform built on a network of Blockchains might be the answer to this less-than-ideal situation. This research paper provides some preliminary suggestions and thoughts regarding the structure and architecture of a hypothetical future Internet that would be powered by Blockchain networks and would connect data and meaning to enable reasoning.

Faten Adel Alabdulwahhab, 2018 Although Web 2.0 has certain issues, we have gone a longway. Due to the loss of democracy, we are now working to bring it back with the use of blockchain technology. Before the blockchain networks, it was difficult to create a protocol with a shared data layer. Moreover, creating a decentralised application was not doable. Nonetheless, there is still a long way to go until decentralisation is complete.

3. PROBLEM DEFINITION

The most important aspect of web 3.0 examples are the voice assistants Siri and Alexa, which show how machine learning may offer a new range of online services. With the exception of

signs of combining machine learning and connecting machines through IoT, the third generation of the internet would operate on decentralised protocols. It's critical to identify a potential convergence point for blockchain in web 3.0. Censorship- resistant P2P data file storage, interoperability, automation via smart contracts, and seamless integration are all features of the third generation of online networks. So, it follows that blockchain would undoubtedly play a big role in the evolution of the next generation of the internet.

4. OBJECTIVE

- To understand the significance of Blockchain in Web 3.0 and how it shapes the future.
- To understand the characteristics of Blockchain and Web 3.0.
- To understand the challenges faced and future prospects of Blockchain and Web 3.0.

5. RESEARCH METHODOLOGY

This research article discusses the various aspects of Blockchain in Web 3.0 for which the methodology applied the Theoretical Research. The information is gathered from online sources and websites and the data is analyzed. The data collected in this research article is secondary data which is collected from secondary sources. The study is collected from previous research papers and relevant information is discussed in this paper.

6. ANALYSIS AND FINDINGS

Problems in the Current Web

a) Loss of Democracy: Data are expanding more quickly than ever before; according to Fig. 1, our total digital universe will contain almost 40,000 Exabytes of data by the year 2020 the information that is known as big data, is being gathered. Big data refers to massive information sets that are gathered in every way conceivable and kept in databases. Big data include the user's location, regularly visited eateries, and the number of calories they expended when running while wearing fitness bracelets. Big data are not just the information consumers submit when they check in to a website.

Big data are paving the way for the future because they are essential for the

development of algorithms and the advancement of artificial intelligence, which will lead to better solutions. Big data are also sold to marketing companies, who use the data analysis to learn how to best present advertisements to users and which ads are the most lucrative. It is a loss of democracy that data be obtained from end users without their consent, awareness, or ability to profit from the collection of their data. Furthermore, according to Jaron Lanier, "Big data and artificial intelligence are economic and political creations that disenfranchise the majority of people."

b) Censorship: In 2010, the OpenNet effort revealed government Internet filtering in more than 40 countries [3]. The freedom of speech is being restricted by these nations' filtering of the political, social,and security spheres. Social media censorship involves blocking particular websites, such as the 1.3 million websites China barred access to in 2010 [4]. One of the biggest issues with the Internet today is the fact that some countries have restricted access to some portions of it. Sincenations are able to restrict websites by blocking their servers' Internet Protocol IP addresses. The present internet enables these nations to filter access and restrict the freedom of their citizens.

c) Bandwidth: It costs money to centralise our data into servers and data centres and address them with the IP address of the location. Since each user would need the same amount of bandwidth to downloadthe file if 10 individuals made the same request, the process would be lengthy and expensive even if the file was on the computer next to you. When retrieving data using the server address, especially when requesting files rather than other information, a significant amount of bandwidth is used. The protocol that needs the IP address of the location is using up bandwidth, slowing down the connection.

d) Security: Decentralized from the beginning, each user set up their own server and owned their own data. However, this was short-lived, and the internet eventually changed to a dispersed centralised web in which enormous amounts of data are kept on servers and in data centres. Thiscentralization created one point of failure, or in the best case, numerous points. As hackers can attack one entity and obtain information about thousands of other companies, having all the data in one location raised the risk. Data corruption is also a problem if we store all of our datain one location if someone attempts to corrupt the data or a system failure occurs, in addition to the increased security risks.

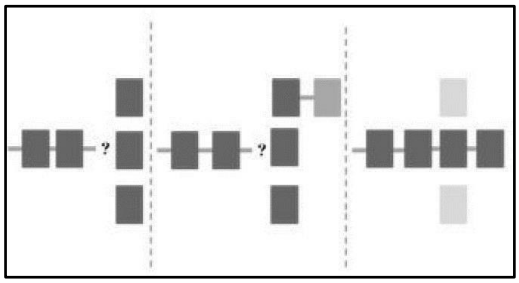
Blockchain Networks

A peer-to-peer P2P network called the blockchain is based on transactions that have no inherenttrust. Every computer (node) in the blockchain network has a duplicate of a shared ledger, and every node in the network updates and maintains this copy. The addition of a transaction to a block connected to the blockchain constitutes the execution of a transaction. A node will broadcast its request for a transaction across the network.

Because transactions are arranged into blocks that are connected to one another in a chain, thissort of network is known as a blockchain network. Each transaction is included to a block together with other transactions that are comparable after being verified using the public key. To link this block to the preceding block in the chain, it must first be verified and checked. The confirmation is accomplished by employing the combined processing power of the network's miners to find an irreversible solution to a mathematical problem by repeatedly running it through a hashing algorithm. A sequential ledger is created once the issue is resolved, the block is verified, and it is linked to the most recent verified block on the chain.

The concept of solving mathematical puzzles to validate the block and upload it to the network may lead to a chain break ambiguous issue If two blocks are confirmed simultaneously, each node adopts and broadcasts the confirmed block it produced. There are several blockchain tails,and each node in the network builds on the block it received first. This will cause an ambiguityproblem, but it will be rapidly rectified because the blockchain network demands that each nodeadopt the longest chain as the only alternative.

Figure 2: End of the chain ambiguity problem



When three blocks in Fig. 2 are solved simultaneously, each one will use the block it generated and broadcast it.

Overcoming the Blockchain limitation

For a decentralised web, using the blockchain protocol alone is insufficient. Storage is one of blockchains' drawbacks. We advise using the Interplanetary File System IPFS protocol to get

around this restriction. IPFS is a peer-to-peer distributed file system that aims to link all computing devices with the same file system, according to the white paper's description [9]. IPFS is a protocol that functions by substituting the IP address required to view a document thatdepends on its location with a hash of the content. By handling vast volumes of data with IPFS and incorporating the immutable, permanent IPFS links into a blockchain transaction, IPFS solves the storage issue for blockchains.

In addition to addressing the storage issue, IPFS significantly reduces bandwidth usage becauseit uses a P2P distribution system for dispersed content. The closest node with the file will respond and transfer the file to the requester using its content hash. As shown in , a p2p distribution system can save up to 60% more bandwidth than a conventional setup. As there is no unique server address that can be blocked, IPFS reduces censorship while enhancing securityby protecting against DDoS attacks.

Blockchain establishing the road for Web 3.0

Blockchain is the foundation for web3.0 when you take into account how it alters the data structures in the backend of the web. The most significant aspect was that it supported the development of a governance layer that would operate on top of the existing internet. Two anonymous parties that don't trust one another can now negotiate and close deals online thanks to the governance layer. It's interesting to note that the primary aim of web3.0's blockchain capability will be to bring in a backend revolution.

Web 3.0 can be thought of technically as a collection of blockchain-based protocols aimed at rewiring the internet's core.

Blockchain in Web 3.0 examples

A popular web 3.0 implementation with explicit blockchain capabilities is called Flow. The decentralised, autonomous organization has created a revolutionary decentralised social protocol for the forthcoming wave of web services. Individuals will have complete control over their social identities and data thanks to the blockchain-based social protocol developed by Follow. Another focus of web3.0 development is the creation of new social infrastructures that follow the fundamental rules of the internet. Blockchain does away with the requirement for trustworthy middlemen while also enabling networks to collectively remember earlier userinteractions or events.

So, it is undeniable that blockchain will play a significant role in increasing internet potential through more decentralisation. on changing the internet's backend circuitry.

Figure 3: The Flow company logoSource: Coin gecko

7. LIMITATIONS AND FUTURE SCOPE

Since the data is collected from secondary sources there are several limitations some of which are mentioned below:

- The way things are measured and analyzed may change as time changes making the historicalcomparison difficult.
- The documents from which the data is collected may lack authenticity as the main author whowrote it is biased or not.
- This research provides a theoretical framework and is not applied research so on the basis of this research applied research can be made. This can act as a base for the quantitative research.
- There may be some gaps in the research as the research is restricted to only the challenges andwhat changed over time.

8. CONCLUSION

Although Web 2.0 has certain issues, we have gone a long way. After losing democracy, we are now headed to repairing it using blockchain assistance. Before the blockchain networks, it was difficult to create a protocol with a shared data layer. Moreover, creating a decentralised application was not doable. Nonetheless, there is still a long way to go until decentralisation is complete. Yet now that these technologies have matured, we have protocols with shared data layers and protocols that offer benefits to their creators. Most crucially, it is now possible to create a dApp. The community is working valiantly to better the situation and further growth isrequired.

Simple web 3.0 observations make it very clear how significant blockchain technology will be. Blockchain emerged as a dominant force, and its distinctive features revolutionized conventional corporate processes. But, blockchain's primary feature of decentralisation is what makes it the ideal foundation for web 3.0. The widespread issues with web 2.0, particularly the concerns about data integrity and centralised control, call for a new kind of internet. Customerswould have access to a free and open internet thanks to the third edition of the web.

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