

How Web3.0 the decentralized web will solve social dilemmas and other problems initiated by the current web

Danish Khan, Saalim Shaikh, Daanyal Parbulkar, Yashfeen Zari, Prof. Nargis Shaikh
Student, Rizvi College of Engineering

Abstract - There continuously quarrel about which is better, web2.0 or web3.0. One of the significant problems of web2.0 is Social Dilemma, which affects our day-to-day life mentality. It is caused by big tech companies which use algorithms that encourage addiction to their platforms. The other problems are loss of democracy, inability to determine what is fake and accurate, and many more problems. The current web2.0 and apps cannot cope with these problems. There enters web3.0, the semantic, virtual, decentralized web. This paper gives an overview of under which circumstances the web is better and where an app is, the problems current technologies have given birth to, and how web3.0 will solve these problems and replace web2.0.

Key Words: Decentralization, Web 3.0, Social Dilemma, Blockchain, Internet.

I.INTRODUCTION

The social Internet is a term used to describe the present state of the Internet. Because it transformed the Internet into a platform for people to share ideas, collaborate, and create new material. Despite its many advantages, the Internet's growth has had some drawbacks, problems that need to be addressed, such as social dilemma has created problems and a loss of democratic control. With the issue of Internet censorship and the fact that we're gathering data on it, there is a potential for security difficulties when dealing with large amounts of data. Before, no protocols existed for the blockchain networks that facilitated the decentralized data, resulting in the loss of all of our data amassed by large platforms, which they then control and possess. DApps and a decentralized web will solve this problem.

2. THE PROBLEMS IN THE CURRENT WEB

2.1. Loss of Democracy

Data is growing exponentially [9]. Extensive information is all of this data. The phrase "big data"

refers to the vast amounts of data stored in databases. A user's location regularly frequented eateries, and calories expended when jogging while wearing fitness wristbands are all examples of big data. As algorithms and artificial intelligence (AI) grow, so does the value of big data, which is why marketing firms buy it and utilize it to get insight into how to offer advertisements to their customers best and which ads are the most lucrative. It is a loss of democracy when users' data is acquired without their consent, even if they are aware of the collection or choose to provide their data. They have been signalling that mega platform corporations are wealthy since users believe that these platforms are free. Because these platform owners benefit without compensating users, people lose their right to control and profit from their data. If any of these platforms fall, user data will be lost since they do not control it. Democracy is lost here. End-users suffer, but competition suffers as well, as new entrants cannot access the same data. Mega-platforms, on the other hand, have the edge over these new developing enterprises since it's not an even start at all. Centralizing money and power are a result of this data centralization.

2.2. Censorship

Government Internet filtering was recorded by the Open Net campaign in 2010 in over forty countries [10]. The freedom of expression is hampered by these governments' screening of political, social, and security issues. In 2010, China banned social media and blocked 1.3 million websites [11]. Governments may restrict websites by banning their servers' IP addresses, a significant issue today. The contemporary Internet enables these governments to regulate the access and limit citizens' freedoms.

2.3. Bandwidth

Centralizing data in data centres and servers and routing it by IP address is expensive. Because if ten users want the same file, it will take the same amount of bandwidth to get it, which is slow and costly even if the file is on the same machine [9]. There is a lot of bandwidth available, exceptionally when requesting files. This protocol costs bandwidth and slows the connection by requiring an IP address.

2.4. Security

Starting in 1989, each user set up their server and controlled their data. The Internet became a centralized distributed network shortly after, with vast data stored on servers and data centres. This focus caused one or two failure spots. Because hackers may attack one company and gain data on hundreds of others, centralizing data has increased the risk. If we put all of our data in one place, not only are security concerns increased, but we also risk losing the integrity of vast quantities of data if someone attempts to corrupt it or if a system failure happens and corruption occurs.

2.5. Social Dilemma

The Social Dilemma examines how giant social media corporations mislead users using algorithms promoting platform addiction. They collect personal data to target users with adverts and are currently unregulated. There is no evidence that users' data is taken to sell advertising or that the data (or behavioural predictions generated from it) is the "product" sold to advertisers.

They don't differentiate between what is wrong and what is true. There is a lot of fake news, conspiracy theories like birds are not even fundamental; they are government drones that gained more than half a million followers. Recommending one's negative side via articles, posts, and feeds because hate gets more conservative views while suppressing the news about the good things one has done or doing. These companies have algorithms that feed off hate speech anger. Because web2.0 is not yet that advanced to suppress these democracies and differentiate between right and wrong, the tech giants take advantage of centralization and feed people whatever makes them satisfied by their network irrespective of true or false, right or wrong, good or bad.

3. THE SOLUTION DECENTRALIZATION

Tim Berners-Lee, the creator of the World Wide Web, stated, "The aim is to revive the concept of a decentralized web. re-establish people's power "[12]. The decentralized web is the answer to all of these issues. Blockchain networks are the technology driving us toward a decentralized web and addressing web 2.0 points [9]. We haven't created a new internet by just constructing a blockchain. Blockchains have their own set of limitations. A blockchain is a foundational technology used by numerous protocols, including Bitcoin, Neo, and Ethereum. In the decentralized web, protocol innovation is exploding, which is vital to overcoming difficulties. The shared data layer and token model are the inventions of the protocol on the decentralized web. What drives protocol development and acceptance, and how do tokens fuel it.

3.1. Blockchain network:

A blockchain network is a P2P network based on trust less transactions using digital signatures. Nodes in the network use this digital signature and the sender's public key to authenticate the message's authenticity. The message's integrity is ensured since the signature is based on current occurrences. After all, tampering with the signature is pointless. Using the news also ensures that the message is not changed and prevents the key from being found and used by someone else for another transaction—elliptic Curve Digital Signature Algorithm. Bitcoin uses the ECDSA method to verify authenticity without compromising security [13].

3.2. Decentralized Protocols:

Initially, Internet protocols like Tim Berners-Hyper Lee's

HTTP allowed decentralized publishing. This is because the Internet as we know it is centralized. Because HTTP is a stateless protocol, the browser and server's connection are closed after completing a transaction. Platforms like Google and Facebook have provided a state-preserving data layer. The early Internet protocols centralized data transfer. But not how they are preserved, leading to data centralization. Blockchains allow for the construction of decentralized protocols and data. Decentralized data centres are no longer required since blockchains provide a standard data layer.

Many protocols determine the network's functioning, node communication, and validation requirements. Blockchain protocols include Bitcoin, Neo, and Ethereum. Each protocol shares a data layer [9]. Thus, a more efficient data layer may be leveraged across several applications by saving data on users' PCs and sharing it across decentralized DApp programs based on these protocols. Users' data, not a platform's servers, would remain.

3.3. Tokenization model:

HTTP and TCP/IP were beneficial internet protocols. That is why people that adopt and create these protocols are rewarded the most. Because protocol development yields little profit, developers increasingly focus on the application layer. But blockchain networks altered everything: the shared data layer and token paradigm form. A token is an abstraction. It signifies ownership of a marketable asset. Blockchain investments include computing power in Ethereum, storage in Storj, and transactions in Bitcoin [9]. Protocol tokens support protocol innovation. Tokens enable protocol designers to monetize their work directly. Create a protocol, issue native protocol tokens, and save some for the inventors. The coins will gain value if the protocol gets popular [14]. Tokens withheld by the protocol creators will be reimbursed based on their system's acceptability and use. A token's value increases with demand. The token model also encourages protocol adoption since investors benefit from rising token values. Consequently, they are more likely to utilize and create tokens to match developer, investor, and user incentives.

3.4. Overcoming Blockchain Limitations:

Building a decentralized network takes more than simply a blockchain. One of the downsides of blockchains is storage. Our recommendation is to use the Interplanetary File System IPFS protocol. "IPFS is a peer-to-peer distributed file system that aims to connect all computing devices," says the white paper[15]. IPFS substitutes the document's location-dependent IP address with a content hash. IPFS solves the blockchain storage problem by processing large amounts of data and inserting immutable IPFS links in blockchain transactions. In this way, the item is protected and timestamped without being attached to the chain [15]. Because IPFS is a distributed

content delivery system, it solves the storage problem while conserving bandwidth. When a file is requested using its content hash, the node closest to the file answers and transfers it [9]. According to [16], a peer-to-peer distribution system may save up to 60% of bandwidth compared to a conventional method. IPFS improves security by preventing DDoS attacks and limiting censorship by not requiring a particular server address to be blocked.

4. CONCLUSIONS

Despite its flaws, Web 2.0 has brought us back a complete approach. With the aid of blockchains, we are on our path to regaining democracy, which has been lost. Many new difficulties had emerged—building a protocol with a shared information layer before blockchain networks were challenging. "It wasn't until this point that decentralized applications were even considered possible." Decentralization is still a work in progress, and we still have a long way to go. Some protocols deliver value to their authors and protocols that share a standard data layer for developers in today's architecture of these new technologies. It is now possible to construct and run DApps. Others devote themselves to improving the web's infrastructure and making it completely decentralized. More development and awareness are needed in the community about the harms of social media. Decentralization may not completely shut down these problems. Still, it will reduce the power and reach tech giants hold, thereby reducing significant issues and making it significantly less harmful.

ACKNOWLEDGMENT

We thank Rizvi College of Engineering and Dr. Varsha Shah for providing the necessary funds and guiding us throughout the project.

Author Contributions

Above mention students wrote the whole paper. Prof. Nargis Shaikh provided support, guidance, review, suggestions on all sections, and updated various sections.

Conflict of Interest

The authors are students and a professor currently studying and teaching respectively at Rizvi College of Engineering.

REFERENCE

- [1] Sharma, M. (2018, September 24). Web 1.0, Web 2.0 and Web 3.0 with their difference. Retrieved from geeksforgeeks: <https://www.geeksforgeeks.org/web-1-0web-2-0-and-web-3-0-with-their-difference/>
- [2] Khan, U. (2018, June 12). The Pros and Cons of Native Apps. Retrieved from clutch: <https://clutch.co/appdevelopers/resources/pros-consnative-apps>
- [3] FRANKENFIELD, J. (2021, June 22). Decentralized Applications – dApps. Retrieved from Investopedia: <https://www.investopedia.com/terms/d/decentralizedapplications-dapps.asp>
- [4] Agrawal, H. (2019, September 06). What are DApps (Decentralized Applications)? – The Beginner’s Guide. Retrieved from coinsutra: <https://coinsutra.com/dappsdecentralized-applications/>
- [5] Summerfield, J. (n.d.). Mobile Website vs. Mobile App: Which is Best for Your Organization? Retrieved from Human Service Solutions: <https://www.hswsolutions.com/services/mobilewebdevelopment/mobile-website-vs-apps/>
- [6] ARUNARSIRAKUL, A. (2015, June 15). Mobile Web vs. Mobile Apps – Survey Report. Retrieved from Jakpat Blog: <https://blog.jakpat.net/mobile-web-vs-mobileappssurvey-report/>
- [7] Cui-hong, H. (2012). Research on Web3.0 application in the resources integration portal. 2012 Second International Conference on Business Computing and Global Informatization (p. 3). Mianyang 621010, China: IEEE
- [8] BHALLA, A. (n.d.). A COMPREHENSIVE GUIDE ON HOW DAPPS DIFFERS FROM TRADITIONAL APPS. Retrieved from Blockchain Council: <https://www.blockchaincouncil.org/blockchain/acomprensive-guide-on-howdapps-differs-fromtraditional-apps/>
- [9] F. A. Alabdulwahhab, "Web 3.0: The Decentralized Web Blockchain networks and Protocol Innovation," in IEEE, Jubail, Kingdom of Saudi Arabia, 2018.
- [10] H. Norman and J. York, "West Censoring East: The Use of Western Technologies by Middle East Censors, 2010- 2011", OpenNet Initiative, 2011.
- [11] Ghosh, "China Shut Down More Than 1M Web Sites Last Year", International Business Times, 2017. [Online]. Available: <http://www.ibtimes.com/china-shut-downmore-1m-web-sites-last-year298167>.
- [12] T. Berners-Lee, Tim Berners-Lee Keynote: "Redecentralizing the web - some strategic questions". 2016.
- [13] S. Driscoll, "How Bitcoin Works Under the Hood", ImponderableThings, 2013.
- [14] A. Wenger, "Crypto Tokens and the Coming Age of Protocol Innovation", Continuations, 2016.
- [15] J. Benet, "IPFS - Content Addressed, Versioned, P2P File System (white paper)", 2014.
- [16] K. Nguyen, T. Nguyen, and Y. Kovchegov, "A P2P Video Delivery Network (P2P-VDN)", in 18th International Conference on Computer Communications and Networks, San Francisco, CA, USA, 2009.