

# **Web3.0: The Internet's Future Architecture**

**Yash Gupta**

School of Computing Science and Engineering  
Galgotias University  
Greater Noida, India  
[yash\\_gupta.scsebtech@galgotiasuniversity.edu.in](mailto:yash_gupta.scsebtech@galgotiasuniversity.edu.in)

**Sanyam Sharma**

School of Computing Science and Engineering  
Galgotias University  
Greater Noida, India  
[sanyam\\_sharma.scsebtech@galgotiasuniversity.edu.in](mailto:sanyam_sharma.scsebtech@galgotiasuniversity.edu.in)

## ***Abstract-***

*The internet is regarded as the most vital international data media. It allows consumers to browse and write information about the world around them. The development of the web has been continuously increasing over the years. In the past couple of years, it has been able to develop various versions. In 1991, the concept of the exemplary net was confirmed. This means that web1.zero is tied to statistics and is used to gather information. The rise of net 2.0 allowed individuals to create and distribute content. Web 3.0 is regarded as the most significant update to the internet. The goal of the semantic internet is to create and think about new information in a way that is most appropriate for humans. The rise of artificial intelligence (AI) is expected to make people more interested in facts. The goal of the Metaverse is to consolidate various virtual spaces. Through the utilization of elevated reality, people can indulge in various diversions and undertakings. The rise of the Internet has created various new obstacles and opportunities for education and online learning. The previous generation of the Internet was known as Web 1.0, which was initially designed as a Read-Only medium. Web 3.0, which is currently in development, is a more technologically advanced version of the web that enables people to perform various tasks and read and write. The development of Web 3.0 has led to the creation of new tools and technologies that can help support online learning and education. This essay aims to provide a brief overview of the various aspects of Web 3.0. The goal of Web 3.0 is to provide a more personalized and comprehensive education and learning experience. It also supports knowledge building through the use of the Semantic Web.*

*Key Words: Web1.0, Web2. 0, Web3.0, Metaverse, multiplied fact, 3-D universe, virtual space, protection and safety, Semantic Web.*

## **I. INTRODUCTION**

Berners-Lee advised the use of the Web 1.0 platform. He said it was boring, but it had apps that were enhanced. According to forums, users should go back to the 2.0 version. People don't download static websites. Instead, they blog. Web 2.0 requires engagement. Its users are drawn to various features such as object notation, JavaScript, and XML. Many of the platforms that are used by users today, such as Facebook, YouTube, and TikTok, have already evolved. Consumers are not knowledgeable about how to use data collected by Web 2.0 platforms. Gavin Wood, the co-founder of Ethereum, thinks that centralized services will lead to monopolies. Tim Berners-Lee's Web 3.0 emphasizes computational semantics. The term Web3 refers to a decentralized system that can be accessed by users. It can be described as having infinite websites and power. The concept of Web 1.0 informs users. Web 2.0 values identity, while users share. Access to platform data can be challenging. On the other hand, users can own all of their data with Web 3.0. The concept of decentralized governance is closely related

to Web 3.0. Despite the hype surrounding blockchain technology, many people still don't understand how it works. The study explores the material related to Web 3.0. The study aims to investigate the potential of internet democracy. The study explores the various aspects of Web 3.0. It shows that it is beneficial for business, culture, and the Metaverse. [1] The study identified areas where improvements could be made.

## II. LITERATURE SURVEY

The semantic web, also known as Web3.0, is a framework that aims to create an open, transparent, and democratic internet. It decentralizes data and allows users to control it. [2] The goal of Web3.0 is to restore internet freedom. Its various features, such as peer-to-peer networks, blockchain, and encryption, address its security, privacy, and data ownership concerns. In his book, Kevin Werbach explores the potential of blockchain technology and its impact on various industries. He covers the aspects of governance and supply chain management that are related to its use. In the whitepaper, Mozilla talks about the foundation of Web3.0 and how it can be used to create a new internet. It provides a framework for building open web applications. In the article, Juan Benet talks about the Interplanetary File System, which is a P2P file system that supports Web3.0. [3] He explores its features and design principles. Sir Tim Berners-Lee is the founder of Solid, a decentralized data-management platform. Its data is managed through a pair of RESTful APIs and linked data. Xinwen Fu and colleagues talk about the redesign of the web for better data ownership and privacy. They suggest a framework that uses blockchain technology and other distributed technologies to improve the management and privacy of online information. This article explores the various aspects of web3.0 governance. It covers the legal, technological, and social aspects of the framework.

## III. TECHNICAL IMPLEMENTATION

The concept of Web 3.0 is generally regarded as being about privacy, intelligence, and decentralized control. It will allow robots to understand human behaviour and provide more sophisticated services. [4]

### a) Semantic Web

As technology and science advance, data collected and stored in the internet can be reused, shared, and analyzed. The RDF is a type of resource property that specifies the relationships between objects and resources. Metadata applications can automate processing of network resources. The Web Ontology Language can make web pages machine-readable. The Web Ontology Language (OWL) is a set of tools that can create and manage web pages that are machine-readable [9]. It can also automate the processing of network resources. One of the main features of the language is its knowledge graphs, which represent the various aspects of web knowledge.

### b) Artificial Intelligence

The processing and data handling of AI are key to its development. Many datasets are train AI image and voice recognition systems. Web 3.0 data will be generated by various services and devices. Perceptual decision-making through closed-loop AI can improve the user experience[14].

AI has made significant advancements in various fields, such as autonomous driving and route planning. It can also help improve the efficiency of medical assistance and retail transactions. AI should be non-discriminatory and fair. Big data can affect consumers negatively. AI may not treat people with dignity and respect. [5] AI may be able to achieve fair and unbiased behavior through its universal nature. However, its negative effects can be mitigated through the development of more secure computing and the Internet of Things.

c) Blockchain

An embryonic blockchain was first created during the 1980s to 1990s. It was launched in 2008. The various advantages of blockchain technology, such as its decentralization, autonomy, anonymity, and auditability, appeal to investors and academics. [8]

Developers can create decentralized applications and smart contracts using the Turing-complete language of Ethereum. Its virtual machine, which is described as quasi-complete, is designed to protect smart contracts from harmful attacks. Other advantages of blockchain technology include the ability to create autonomous organizations and manage reputation systems. There are various metrics that can be used to measure the decentralization of blockchain technology. A simple approach was suggested by Croman et al. They believe that more addresses could improve the decentralization of blockchain. Web3's semantic and knowledge-focused blockchains are expected to be among the most popular technologies in 2019. These technologies rely on AI to power their web services. The complexity of decentralization, [10] privacy, scalability, and anonymity seems insoluble, which could encourage developers and academics to explore other alternatives.

d) Decentralized Storage

Although it is not necessary for Web 3.0 to have decentralized storage, it is a safer and more reliable method of storing data. Users and Web 2.0 apps have an unspoken understanding of each other. They use platforms and services to store their data. The lack of synchronization and data transfer across different systems can be caused by "data islands." Although consumers gain the autonomy to store their data, achieving fair benefit sharing and lowering costs are crucial issues. [12]

- IPFS:

IPFS can replace HTTP4 in that it fragments files. These files are usually addressable and contain no more than 256 kilobytes. List or tree files are organized around these fragments. The hash table's value-key is the location node's hash fingerprint.

IPFS allows users to manage their files using Git-like features. [13] It also supports the conversion of URLs to IPFS.

- CephFS:

CephFS 70 is an open-source distributed, high-performing, and scalable platform that can be accessed by anyone. Its RADOS clusters are composed of OSDs, clients, and monitors. [16] These clusters store and manage OSD data. The platform is built on a distributed architecture that disperses heavy weights. Its robust and resilient RADOS clusters are ideal for handling large amounts of data. Consistent and predictable storage is maintained through Swift's algorithm, which uses hash to divide items between different virtual nodes. Its event-driven consistency ensures high availability and horizontal growth. Proponents of decentralization can benefit from hot storage, which makes it easier for users to connect with others. IPFS users can

get paid by BitSwap for accessing the platform's resources, while ARweave and Filecoin reward them with rewards. [14]

- Edge Computing:

The rise of COVID-19 has increased global data traffic and network traffic. In 2020, 59 ZB of worldwide data was collected. Cloud computing is helpful in processing big data files, but it can also strain the network and computers. Fog and edge computing were suggested to analyze the data. The advantages of edge computing are its ability to process data independently and its low energy consumption. It enables devices to store, decide, and process data. Compared to cloud storage, edge computing is more energy-efficient and quick. [15] It can also reduce network transmission risks. An attacker who is able to access the data at the edge computing node can potentially reveal sensitive information such as the health information of household members and vehicle data. Due to the lack of encryption, an attacker can also expose other sensitive data such as medical records. The use of edge computing and flexible storage (FL) protects user data and nodes. It enhances devices and large data sets.

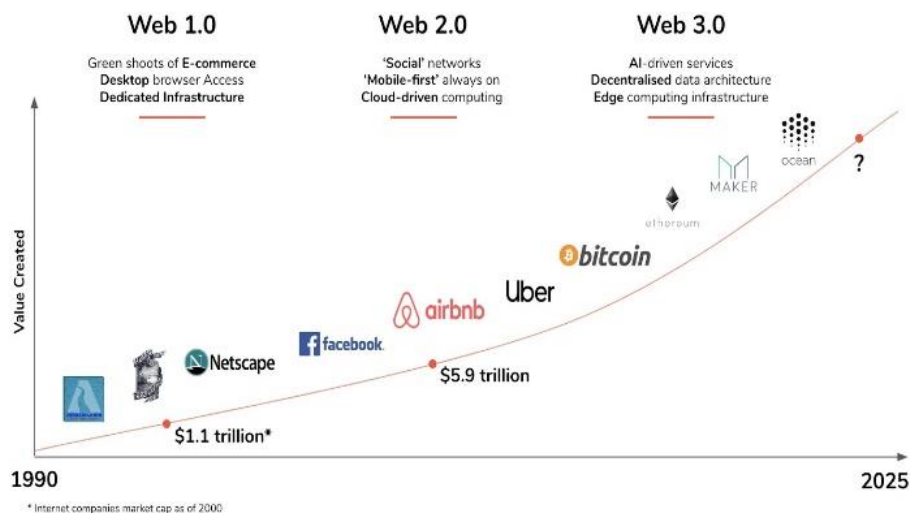


Fig 1: Shows the evaluation of web.

#### IV. REVOLUTIONAND ADVANTAGES

- Application and Business

- Web 1.0:

The concept of web 1.0 created a need for knowledge transmission that traditional methods could not provide, and the four components of this ecosystem are shown in Figure A1. [17] The first gateway is Yahoo, followed by Baidu, Google, and Sina. These websites allow users to access offline human knowledge. Queries are answered correctly by search engines. They do not display content. Google's Material is categorized as an online library. The search engine has grown into one of the world's most powerful and advanced search tools.

- Web 2.0

The rise of web 2.0 has caught the attention of the global internet community. It offers various platforms for publishing. The vertical usage of web 2.0 products is shown in Figure A2. We'll be showcasing some of its successes. One of the most popular platforms is WeChat, which

replaced text messaging services such as those from phone companies. Twitter also has photo sharing and character-limited internet chatting. Twitter enables users to communicate and share their lives. Apple's iPhone was the first mobile device to run web 2.0 software. Android5 and iOS also support web 2.0 applications. The hardware research that has improved these platforms has made them more useful. [18]

- Web 3.0:

White papers report that the COVID-19 pandemic has boosted the digital economy, generating many monopolist giants. (Facebook, Google, Tencent, Amazon). Break internet platform monopolies. Web 2.0. Ownership unknown. User data helps most Web2.0 firms. Cyberethics [19]. Web 3.0 creates a worldwide digital economy. Breaking platform monopolies, generating new markets and business models. Blockchain and P2P servers power Web 3.0. Events shaped them. A2 and A3 compare popular Web 2.0 and 3.0 apps. Status protects texting. Peer-to-peer secures communications. Unlike WeChat. Trawling, sifting, and propagandising platform data. Pseudonyms enable selective disclosure. Open source. Protected apps rule Web 3.0. Steem 18. Blockchain empowers people over social media businesses. Steemit lets creators EOS supports blockchain apps. Windows-like EOS.IO7. EOS blockchain. EOS works on phones, iPads, and browsers.

- b. User Experience

The rise of Web 3.0 is expected to bring about technical integration in various domains. This is a significant event. During the 21st century, we will be looking into the user experience of various web platforms.

- Compatibility:

Due to the nature of web 2.0 applications, they often face data segregation issues when it comes to moving data across multiple platforms. With the help of web 3.0, they can now utilize common APIs without having to use Bitcoin or Ethereum. Web 3.0 is a set of reusable and composable data that enables applications to use it in various contexts. Its digital wallet allows users to save online data and retrieve it from a third party. This eliminates the need for them to store and manage their data in separate silos, and it allows them to move their data across multiple platforms and devices.

- Permissionless:

Governments and internet platforms no longer store application data. Instead, users can distribute this information to service providers. Users' data is stored on a third-party server or home computer. Other applications can request this data. Although the platform no longer holds user information, it still needs to access it to perform its functions.

- Metaverse

Governments and internet platforms no longer store application data. Instead, users can distribute this information to service providers. Users' data is stored on a third-party server or home computer. Other applications can request this data. Although the platform no longer holds user information, it still needs to access it to perform its functions. Users can now distribute their data to service providers. This eliminates the need for governments and internet platforms to store application data. The Meta means start, core, and end. Web 3.0 makes it easier for developers to create virtual metaverse applications. It can also help enhance the digital life of users by allowing them to experience augmented reality and virtual reality. Educational institutions can benefit from virtual classrooms, as well as interaction and advice. Lin et al.

explored the potential of metaverse education, and found that games, music, and films can introduce kids to the world of virtual reality. Web 3.0 also provides users with a level of protection against cybercrime. The concept of the metaverse refers to the idea that virtual worlds can be created and operated without the need for traditional infrastructure. It also refers to the changes that occur when the metaverse is created. Web 3.0 allows producers to be more productive by keeping them in a decentralized manner.

- **AI Generated Content**

ChatGPT is a real-time chat system that allows businesses and academics to interact with each other in real-time. It was surprising to see how well it performed against OpenAI GPT. ChatGPT's NLP is capable of creating novel programs and tools, such as machine translation and voice search engines. AI has the potential to improve web 3.0. It can organize and find information better, and it can boost emotion, speech, and movement. AI cannot replace human creativity for an indefinite amount of time. However, web 3.0 allows companies to create high-quality content at cheap prices.

## **V. CHALLENGES AND ISSUES**

Despite the potential of Web 3.0 to end the data monopoly of corporations, there are still many technical and social issues that need to be resolved.

**Governance and Organization:** The concept of two-sided coins addresses the preservation and ownership of data. However, governance challenges such as money laundering and economic inequities still exist. Bitcoin hoarders can reign. Old monopolies can have money, and data security can prevent income audits. Finally, centralized governments are needed to prevent financial fraud and insider trading. After suffering a 92% loss following the "hustle," DogeCoin is expected to return 150 times higher. Due to the lack of regulation, security, data, and competitiveness will become more prevalent. Bitcoin is not Web 3.0's economy.

- **WEB3 VS WEB 3.0:**

Smart terminals are featured in Web 3.0. Instead of relying on a distributed ledger, Web3 prioritizes blockchain governance. It also has non-fungible money and incentives, and it is uncommercial. Non-fungible token firms (NFTs) are commonly used to secure digital asset ownership. They benefit both the creators and investors. The emphasis on reliance is apparent in Web3. Despite its decentralized nature, Web3 requires fame. Its users have the necessary decentralized data to distribute it. It utilizes advanced distributed technologies.

## **VI. CONCLUSION**

Many older individuals do not embrace Web 3.0. It is an intelligent, decentralized, and 3D internet of things. Its decentralized nature may burden users. Hate speech and terrorism charges can be made more difficult with the decentralization of information.

The effects of Web 3.0 are the subject of this poll, which proposes research on its potential. A study suggests that virtual equality could be achieved through the use of Web 3.0. However, it

is not clear how this will be achieved due to the lack of sufficient research on its various components. In addition to this, crime and ethics are also discussed briefly.

## VII. REFERENCES

1. Abraham Bernstein, James Hendler, and Natalya Noy. 2016. A new look at the semantic web. *Communications of The ACM* 59, 9 (2016), 35–37.
2. Amber Case. 2017. Why the Internet needs IPFS before it's too late. <https://techcrunch.com/2015/10/04/why-the-internet-needs-ipfs-before-its-too-late/>
3. Ayushi Abrol. 2022. Web 3.0 vs. Metaverse: A detailed comparison. <https://www.blockchain-council.org/metaverse/web-3-0-vs-metaverse/>
4. CAICT. 2021. Mobile Internet application personal information protection and governance. Technical Report. China Academy of Information and Communications Technology. <http://www.caict.ac.cn/kxyj/qwfb/bps/202111/P020211119513519660276.pdf>
5. Faten Adel Alabdulwahhab. 2018. Web 3.0: the decentralized web blockchain networks and protocol innovation. In *Proceedings of the 1st International Conference on Computer Applications & Information Security*. IEEE, 1–4.
6. Juan Benet. 2014. IPFS-content addressed, versioned, P2P file system. *arXiv:1407.3561* (2014), 1–11.
7. Keyan Cao, Yefan Liu, Gongjie Meng, and Qimeng Sun. 2020. An overview on edge computing research. *IEEE Access* 8 (2020), 85714–85728.
8. Maurizio Atzori, Georgia Koutrika, Barbara Pes, and Letizia Tanca. 2020. Special issue on “Data exploration in the web 3.0 age”. *Future Generation Computer Systems* 112 (2020), 1177–1179.
9. Nupur Choudhury. 2014. World Wide Web and its journey from Web 1.0 to Web 4.0. *International Journal of Computer Science and Information Technologies* 5, 6 (2014), 8096–8100.
10. Piero Andrea Bonatti, Stefan Decker, Axel Polleres, and Valentina Presutti. 2019. Knowledge graphs: New directions for knowledge representation on the semantic web. *Dagstuhl Reports* 8, 9 (2019), 29–111.
11. Ryan Browne. 2022. The luna cryptocurrency has been resurrected after its \$40 billion collapse. It's already crashing.
12. Tim Berners-Lee, James Hendler, and Ora Lassila. 2001. The semantic web. *Scientific American* 284, 5 (2001), 34–43.
13. Timothy John Berners-Lee. 2019. Semantic web road map. <https://www.emse.fr/~beaune/websem/SWRoadmapLee.pdf>
14. Timothy John Berners-Lee. 2019. Information management: A proposal. Technical Report. European Organization for Nuclear Research. <https://cds.cern.ch/record/369245/files/dd-89-001.pdf>
15. Tom Brown, Benjamin Mann, Nick Ryder, Melanie Subbiah, Jared D Kaplan, Prafulla Dhariwal, Arvind Neelakantan, Pranav Shyam, and et al. 2020. Language models are few-shot learners. *Advances in Neural Information Processing Systems* 33 (2020), 1877–1901.



16. Usman W Chohan. 2018. The concept and criticisms of steemit. CBRI Working Papers (2018), 1–10.
17. Usman W Chohan. 2022. Cryptocurrencies: A brief thematic review. Available at SSRN 3024330 (2022), 1–38.
18. Vitalik Buterin. 2021. A next-generation smart contract and decentralized application platform. White Paper 3, 37 (2014), 1–36.