

---

## AN OVERVIEW OF THE EXPECTED INFLUENCE OF WEB 3.0 ON e-COMMERCE AND ALLIED DOMAINS

Rishikumar Suresh Kumar  
 Software Engineer, Collins Aerospace, Cedar Rapids, Iowa  
 rishikumarsuresh@gmail.com

Received 16 August 2022 Received in revised form 28 August 2022 Accepted 02 September 2022  
 Available online 11 September 2022

### ABSTRACT

The Web has come a long way since the creation of the first web by Tim Berners -Lee in 1990 and Web 3.0 which is the next big thing in e-commerce, offering a more user-friendly shopping experience. Web 3.0 makes it easier for consumers to find what they're looking for and complete transactions quickly and easily. For decades, the global economy has thrived on the internet, and for the better part of that time, it has been subjected to web2.0 which is a centralized system. Presently the world is in the transition to web 3.0 which is a more decentralized system.

Web 3.0 combines some of the best static and dynamic elements from Web 2.0 and Web 1.0, with an abundance of new features to deliver a user experience that's more intuitive, enjoyable, and engaging for consumers as well as more efficient and cost-effective for retailers. One of the special features of Web 3.0 is that clients themselves can customize business-related web content anytime anywhere with a highly developed web 3.0 data blockchain. Web 3.0, though it is in the development stage, promises far-reaching impacts on the way e-commerce works in the future.

This review provides a brief idea of how the journey of the web has so far transitioned from web 1.0 through Web 2.0 and now onto Web 3.0, and several layers of technical innovations which are housed in the web 3.0 platform are also discussed

**Keywords:** Web 3.0, Blockchain, cryptocurrencies, dApps, DeFi, Metaverse, NFT, Edge computing

### I.INTRODUCTION

The term e-commerce refers to all commercial transactions or exchanges of information like buying or selling products and services electronically with the help of the internet. The term e-commerce was originally considered to describe the business transactions like Electronic Data Interchange (EDI) and Electronic Funds Transfer (EFT). These technologies, which first appeared in the late 1970s, allowed for the exchange of information and the execution of electronic transactions between businesses, typically in the form of electronic purchase orders and invoices. EDI and EFT were the enabling technologies that formed the base for present-day e-commerce. The Boston Computer Exchange, a marketplace for used computer equipment started in 1982, was one of the first known examples of e-commerce[1]. It should be noted that electronic commerce was started in the 80's itself with the usage of credit cards, ATM machines, or telephone banking before the internet breakthrough[2].

According to Albertin et al [3] the evolution of e-commerce can be divided into four phases. In Phase One, organizations used the Internet for processes of sharing information regarding their product and services. Phase Two was used by the organizations for receiving orders and sending information/ instructions regarding their products and services. Phase Three of the evolution, according to Albertin et al [3] was the distribution of products and services by using Information Technology (IT). In this phase, some products began to be commercialized digitally as, e.g., music and software. For the last comes the phase which consolidates EC, with the interaction between seller and consumer, no more transmitting data or delivering products and services only.

Tian et al [4] consider the period 1995 to 1995 as the "GOLDEN AGE" OF E-COMMERCE. From 1995 to 1999, many companies have started online transactions by building their own websites. In 1996, e-commerce transactions in the United States resulted in \$707 million in revenue, which increased to \$2.6

billion in 1997, and \$5.8 billion in 1998 [5]. From October 1998 to April 2000, more than 300 Internet companies made initial public offerings [6]. There were approximately 600 thousand e-commerce sites in the US by the end of 2000 [7]. Amount spent on Advertising on the Internet also increased from \$267 million in 1996 to \$3 billion in 1999. The sales of Amazon increased from less than \$16 million in 1996 to \$1.6 billion in 1999, and the daily sales of Dell increased from under \$1 million to \$40 million in less than 3 years [8].

Nowadays, it's tough to imagine daily life without e-commerce. We order food, clothes, and furniture; we register for classes and other online services; we download books, music, and movies; and so much more. In recent years, e-commerce has enjoyed a massive boost from the rise of smartphones, which allow consumers to shop from nearly anywhere. These commercial transactions happen either as business-to-consumer (B2C), business-to-business (B2B), consumer-to-business (C2B) or consumer-to-consumer (C2C)[2].

Increasingly business houses are employing websites that provide the functionality to perform over-the-web commercial transactions. Since the emergence of the World Wide Web (WWW), vendors can easily sell their products to different kinds of people over the internet. Many people prefer online shopping because of its different kinds of convenience. They can find a specific product by searching various online stores which is a less time-consuming and tedious process rather than searching for this product in various stores in the market [9]. The most common online retailing companies are Amazon.com, Alibaba, and eBay. The success of retail is no more about physical stores, this is due to the increase in stores that offers online shopping for consumers [9,10]. Online Shopping System helps in buying products, products, and services online by choosing the listed products from a website(E-Commerce site).

The Web is an evolving space with new features being added all the time. In 1997, it was just a simple way to view content online without any interactivity or ability for users other than those at their computers - this web page could be viewed only on one device that had been specifically set up by you, that was Web 1.0! We now live in Web 2.0, which allows users to create interactive websites with a global reach. The interactivity of Web 2.0 opened the door for the age of

social media. Social media companies like Facebook (Meta), Twitter, WhatsApp, and Instagram allow people to share their lives with others and travel abroad without leaving their homes[11]. The centralized kind of Web 2.0 has some major issues like security threats, data gathering for malicious purposes, privacy intrusion, and cost. Whereas web 3.0 a decentralized web, is the stepping stone toward intelligent applications. The main idea behind Web 3.0 is to assist web users to contribute information in ways that computers can understand, process, and exchange [12].

## **II. DEVELOPMENTS OF E-COMMERCE WITH EACH WEB ITERATION**

### Web 1.0

Each web iteration presents a unique online commerce experience.

Web 1.0 is the first e-commerce experience and it happens to be a hybrid of text and physical stores.. With this, people could send texts, and make reservations for a product in the physical store, but can not necessarily complete a purchase online.

While big brands like Walmart and Costco were the biggest winner in this era, they leverage their chain of physical stores and were able to reach customers residing in the immediate communities. Eventually, the first commerce experience can be considered as a centralized retail experience.

### Web 2.0

Web 2.0 which is also a centralized e-commerce platform provides a more interactive online shopping experience and consumers expect that same level of interaction when shopping in the physical store.

According to various industry analysts, this iteration of commerce grew on a low-cost, high-scale model, implying that there is a low entry barrier. However, e-commerce giants like Amazon, Walmart, Alibaba, etc have control over centralized e-commerce and making it nearly impossible for small firms to prosper. The major drawback of commerce 2.0 is a monopoly that thrives on centralized authority.

### Web 3.0

Web 3.0 is the third iteration of e-commerce which is decentralized. E-commerce with Web 3.0 wants to re-

engineer the overall online commerce experience by (i) eliminating central authority and (ii) extra cost for interfacing with middle man/gateway services.

Commerce 3.0 aims to build an open economy for creators and ensures alike.

An open economy booms on trust, transparency, and borderless exchange. In addition, it also creates a conducive atmosphere for customers and sellers to interface directly with one another without any form of intervention by third-party/middlemen. In the future monopolization of e-commerce will come down and web 3.0-based e-commerce will be a favorite to all[13.]

**Evolution of the web from 1.0 to 3.0**

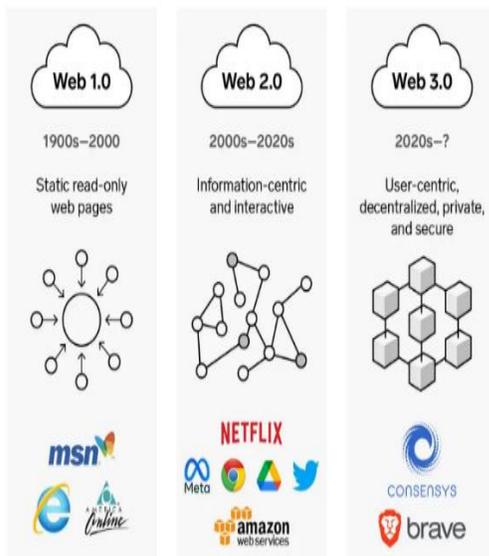


Fig. 1a.: Evolution of the web from 1.0 to 3.0[14]

**The evolution of web**

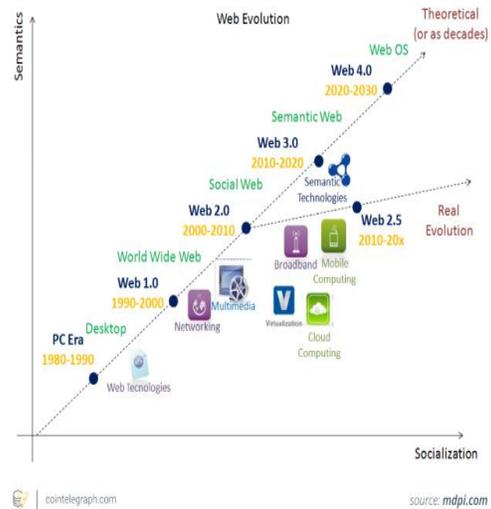


Fig. 1b: Evolution of the web from 1.0 to 3.0[14]

**Web2 & Web3 -A comparison**

Web 2.0 and Web 3.0 are similar technologies with similar backgrounds, but they approach challenges differently. Web 2.0 focuses on reading and writing content, whereas Web 3.0 focuses on creating content (Semantic Web). Web 3.0 is much better since it utilizes technology to facilitate information interchange amongst web users while simultaneously enhancing cybersecurity.

More differences of web2.0 and web3.0 based on currency, content ownership, speed technology, and application are listed in table 1.

**Table 1**

|                   | Web2   | Web3  |
|-------------------|--|---|
| Currency          | Payments on Web 2 are made in fiat money. Government-issued money, such as the US dollar, is used during transactions  | Web3, on the other hand, uses cryptocurrencies such as Ethereum or Bitcoin, which are encrypted digital currencies to fund transactions |
| Content Ownership | With Web 2.0, the network assumes control for information storage, causing access issues and concerns about the anonymity and protection of online data.               | Web 3.0 solves this problem by letting data be exchanged in several locations simultaneously.   |
| Speed             | Web 2 transfers are quicker than Web 3 transfers. Web 2 scans for information kept in a fixed place, generally on a single server, using HTTP in unique web addresses. | Web3, on the other hand, assigns ownership to numerous others (decentralization).   |
| Technology        | The most common Web2 technologies include – AJAX and JavaScript, HTML5, and CSS3.  | ML, deep learning, semantic web, and decentralized technologies power Web3.   |
| Applications      | Web2 includes podcasts, social bookmarking, blogs, RSS feeds, and video sites.   | Web3 incorporates AI and machine learning-powered dapps, virtual worlds, and 3D portals.  |

### III. PILLARS OF WEB 3.0.

The main pillar of Web3 is “trustless”. Since Web3 is not built on a centralized network, there is no need to trust any other third party for financial transactions. Everything is run on a blockchain system with the help of AI and machine learning. In contrast, the service providers (e.g., Google, and Facebook) control the system in Web2. The major pillars of Web 3.0 are discussed below[15].

#### Decentralization

The current state of the internet is being dominated by a few companies. Figure 2 shows that almost 57% of global application traffic went to 6 companies. In Web3, ownership is not in the hands of a few entities and it is distributed among users. An algorithm provides the services which are hosted by all of the participants.

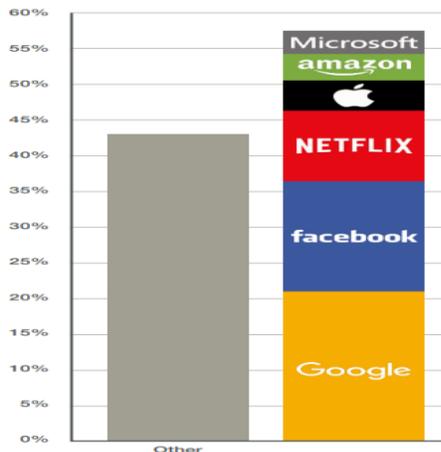


Fig. 2: Global application traffic in 2021[16]

#### Permissionless

Anyone who has access to the network can utilize the services, no one can be banned or excluded because the network is decentralized and there is no centralized authority to verify data transmission, verification happens at the user level with the thousands of nodes participating.

#### Trustless

It means that there is no centralized network which means there is no need for a trusted third party to

facilitate interactions between two pirates. The only trust that is needed is in the underlying algorithm.

#### Native payment

Instead of relying on a slow and bureaucratic banking system, payments will be done in cryptocurrencies. No limitation can be imposed on money transfers as cryptocurrencies such as Bitcoin and Ether are decentralized, meaning no one can impose limitations on tokens transfer.

#### Ownership

Users own their data and can decide how much of it they want to share. If a user owns an NFT(Non-Fungible Tokens) from a game and the game manager removes their account, the user still owns the NFT which is a major change from the Web2 ownership system. NFTs will play a major role in Web3 as they will function as proof of ownership.

#### Censorship resistance

All data is stored in the blockchain which means it is tamper-proof and immutable. No one can delete them or censor them.

### IV LIMITATIONS & PROBLEMS OF CURRENT WEB3 INFRASTRUCTURE

#### Performance -Speed and Storage

**Speed:** Major blockchain networks are slow when compared to centralized networks. There is always a trade-off between decentralization, scalability, and security. This is referred to as the blockchain trilemma. In order to people transition from web 2 to Web3, web 3 needs to provide all of these at the same time. However, solutions such as layer 2 and sidechains are being developed to tackle this trilemma, but they are far from perfect.

**Storage:** Storing data on the blockchain is not cheap. For instance, storing 1GB of data on the Ethereum blockchain costs thousands of dollars.

**Too much decentralization:** No one can censor or ban a user on Web3. This means that illegal content cannot be taken down as there is no centralized power.

#### Traceability

Cryptocurrencies are anonymous and untraceable. It means that neither the sender nor the receiver be identified, and the entire amount of the transaction should never be made public. Unfortunately, the blockchain for Bitcoin makes this information

available to anyone who knows your wallet address. An anonymous cryptocurrency should also include a technique for mixing transactions based on, which is impossible to tell which sender sent a certain payment.

#### Speculation in the cryptocurrencies

If cryptocurrencies are to be used as a payment mechanism in Web3, they must function as real money. This means that they should have the store of value function which they currently lack due to their volatility. Stablecoins are also not a good substitute as stablecoins like Tether are centralized stablecoins that are supposedly backed by US Treasuries and dollars [15]. Algorithmic stablecoins are also not a good option as they can lose their value easily as happened in the case of Terra.

### **V. VARIOUS COMPONENTS OF WEB 3.0**

In the following section, influence of web 3 on various components e commerce will be discussed.

Blockchain, DeFi ,NFTs, decentralized autonomous organizations (DAOs),metaverse, dApps and are all part of Web3 .

#### **1.Blockchain and cryptocurrencies**

Web 3.0 is a possible future version of the internet based on public blockchains -a record-keeping system best known for facilitating cryptocurrency transactions.

The blockchain is a ledger or record of transactions. The blockchain exists in its entirety on multiple computers spread across the internet. Whenever a new "block" of transactions is added to the chain, all database copies must agree and be amended. All transactions are open to public view and permanent.

Any attempt to meddle with the record corrupts the chain, and since validated copies of the database are spread all over the web, no central authority can control it. Blockchain technology can be used for any application to keep a record of transactions, but most people associate it with cryptocurrency.

Cryptocurrency (also known as "crypto") is decentralized digital cash that isn't controlled by any government or a central authority like a bank. Cryptocurrency uses blockchain technology to record

how much currency there is and who holds what amount of it.

The supply of cryptocurrency is increased through "mining," which provides computational power to run the blockchain in exchange for new currency. At least, that's the way it works with "classic" cryptocurrencies like Bitcoin. In the case of the Ethereum blockchain, for example, end-users pay a "gas fee," which is received by Ethereum miners who process transactions [18].

#### **2. Non-Fungible Tokens -NFTs in the Web 3.0 platform**

NFTs are another cornerstone of Web3. NFTs are cryptographic assets on a blockchain. Each NFT has unique identification codes and metadata and hence cannot be exchanged for another. That's what the non-fungible part of the name means. NFTs are linked to digital or physical assets in the same way that the paper title deed for a house represents ownership[17]

Unlike cryptocurrencies, they cannot be traded or exchanged at equivalency. Cryptocurrencies are identical to each other and hence they can serve as a medium for all commercial transactions[18].

#### Uses of Non-Fungible Tokens

NFTs can be used to digitally represent physical assets like real estate and artwork. Because they are based on blockchains, With NFTs artists can be connected without intermediaries.

NFTs extend beyond their usage in the purchase of digital artworks. NFTs can also be used for purchasing digital lands in the virtual world, such as Metaverse. NFTs also serves as a great option for next-generation digital music ownership, publishing, and licensing.

Digital and nondigital collectibles, event tickets, and in-game items like avatars are some of the assets that NFTs can represent.

One big advantage of NFT is that any legal authority does not necessarily recognize NFTs, so ultimately, all you're buying at this point is control over a string of letters and numbers. However, as NFT technology evolves and perhaps benefits from legislation, that may change[19].

Current examples of NFT market

*Sale of NBA Top spot NFTs:* NBA Top Shot is an NFT marketplace to trade short video clips from NBA and WNBA games as NFTs. It is a place to collect non-fungible tokenized NBA moments in digital card form. Some of these cards have sold for millions of dollars. [20]. Gameflip is the simplest and no-hassle way to sell NBA TopShot NFTs for fiat currency. In Feb 2021 ,Top Shot NFT of LeBron James dunking was bought by Jesse Schwarz for \$208,000 which sets a record. It was the most expensive sale in the platform’s short history[21].

*Sale of a Tweet on NFT:* Twitter's Jack Dorsey tweeted a link to a tokenized version of the first tweet ever, in which he wrote: "just setting up my twttr." The NFT version of the first-ever tweet sold for more than \$2.9 million. [22]

*Sale of Art work on NFT:* Beeple -a digital artist sold a group of NFTs for\$69 million in early 2021. The artwork was a collage comprised of Beeple's first 5,000 days of work. [23].

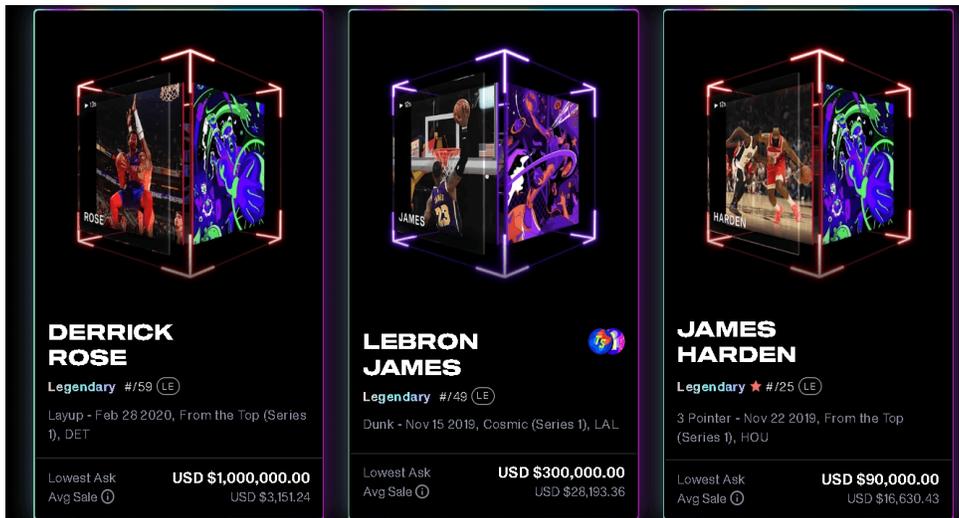


Fig. 3: The top three NBA Top Shot NFTs by asking price[24]

**Cryptocurrencies and NFTs**

Like physical money, cryptocurrencies are fungible, meaning that they can be traded or exchanged, one for another. This fungibility characteristic makes cryptocurrencies suitable as a secure medium of transaction in the digital economy.

NFTs are unique and are irreplaceable, meaning that it is impossible for one non-fungible token to be equal to another. NFTs are digital representations of assets and have been likened to digital passports because each token contains a unique, non-transferable identity to distinguish it from other tokens.

They are also extensible, meaning you can combine one NFT with another to “breed” a third, unique NFT.

Just like Bitcoin and other cryptocurrencies, NFTs also contain ownership details for easy identification and transfer between token holders. Owners of NFT can add metadata or attributes pertaining to the asset in NFTs so that it can be easily identified by the owners.

Purchase of NFTs

Many NFTs can only be purchased with Ether, so owning some of this cryptocurrency—and storing it in a digital wallet—is usually the first step. One can then purchase NFTs through OpenSea, Rarible, and SuperRare or through any of the online NFT marketplaces [18]

**Fungible vs. nonfungible tokens**

|                     | Fungible tokens           | Nonfungible tokens                       |
|---------------------|---------------------------|--|
| Main features       | Divisible                 | Indivisible                              |
|                     | Non-unique                | Unique                                   |
|                     | Interchangeable           | Irreplaceable                            |
| Real-world purposes | Payment system            | Intellectual property                    |
|                     | Store of value            | Academic title                           |
|                     |                           | Artwork                                  |
|                     |                           | Music composition                        |
|                     |                           | Gaming                                   |
|                     |                           | Utility                                  |
|                     |                           | Assets like stocks, shares               |
|                     |                           | Access to a service i.e., a subscription |
| Technology used     | Own blockchain            | Built on another blockchain              |
| Example of tokens   | Bitcoin; Litecoin; ERC-20 | ERC-721                                  |
| Content stored      | Value                     | Data                                     |

 | cointelegraph.com

Fig. 4: Cryptocurrencies(Fungible)vs NFTs [25]

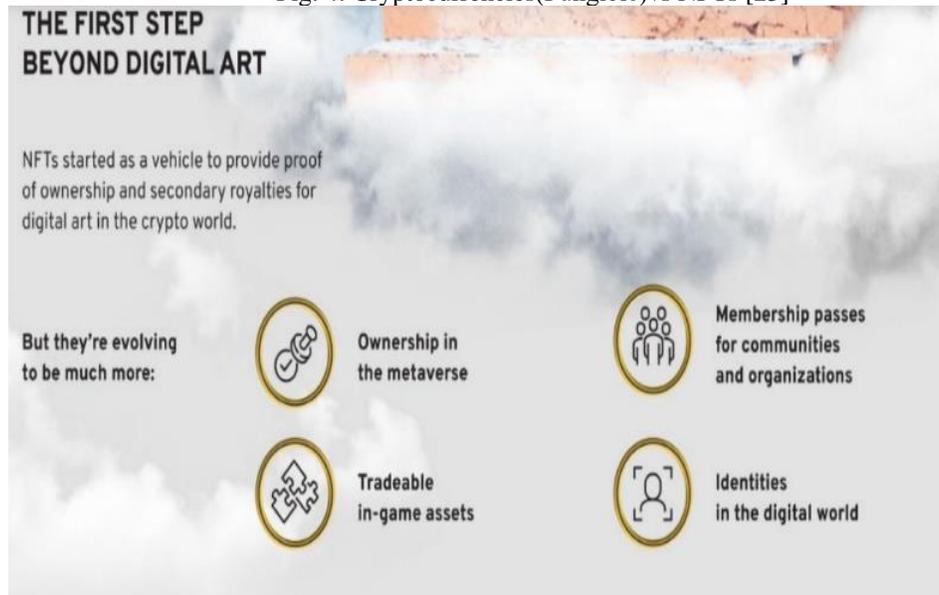


Fig.5: NFT's usage beyond purchase Digital Art[26]

### 3.The Metaverse

The metaverse is a term used to describe the virtual world in which people can interact with each other and with digital objects in a realistic way. the metaverse is a natural extension of web 3.0.

The word “metaverse” is originally from the 1992 sci-fi novel “Snow Crash”. Recently Facebook brought the

Metaverse to the mainstream by rebranding itself as “Meta”. The Metaverse is not yet a concrete reality, while the vision of it is a 3D immersive world where we will be spending a lot of time socializing, working, entertaining, learning, etc. It is the combination of virtual reality (VR), augmented reality (AR), mixed reality (MR), gaming, cryptocurrencies, social media and much more.



Fig.6: The metaverse happens at the intersection of Web3/Blockchain, MR and gaming.[27]

### Applications of metaverse

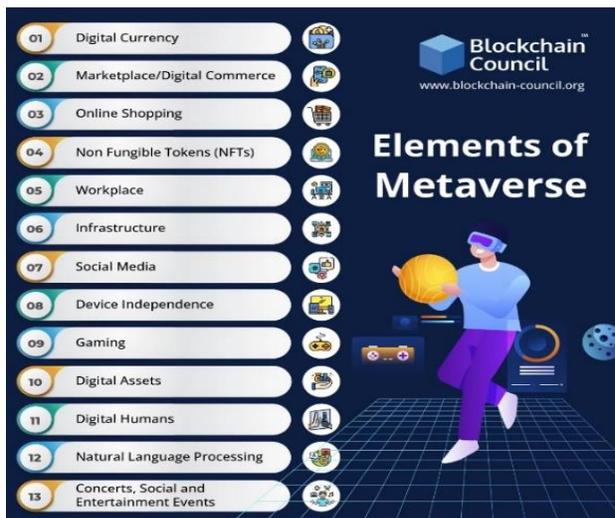


Fig.7: Applications of Metaverse [28]

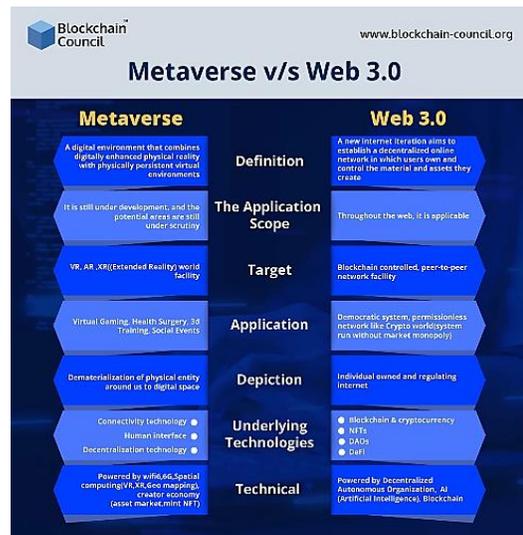


Fig.8: Metaverse vs Web 3.0[28]

Metaverse – Transformation of 2D Web page to 3D space

To put it in very simple terms, the Metaverse is a new way for people to use the internet by transforming it from 2D to 3D. Instead of browsing and interacting with the web content by clicking and flipping different pages and tabs on the 2D screens on computers or mobile phones, this web content is transformed into three-dimensional objects. Take online gaming as an example, instead of playing the games on a 2D webpage. The webpage is transformed into a 3D space where users can walk around inside, interact with other users and play the games as in-game avatars. Users can interact with the web content virtually and immerse themselves in the virtual space. With the integration of virtual reality headsets, users can even have an immersive experience visually and physically.

**4.Decentralized Apps (dApps)**

Dapps are like normal apps, and offer similar functions. The main difference is that dApps are run on a blockchain-like peer-to-peer network using smart contracts[29].

dapps are decentralized and they have the following features:

- dApps are open-source and operate on their own without anyone entity controlling them.
- dApp’s data and records are public.
- dApps use blockchain-like cryptographic tokens to help keep their network secure.

Benefits of dapps

Dapps have the following interesting aspects:

- No Censorship - governments or any individuals can not to control the network easily and hence chances of single point failure is very remote
- No downtime – Since dapps rely on a peer-to-peer system, dapps continue to work even if individual computers or parts of the network go down.
- Blockchain-based - As they are made using smart contracts, they can easily integrate cryptocurrencies into the basic functionalities of the dapp.
- Open-source - Open-source dapps encourage the widespread development of the dapp ecosystem and enable developers to build better dapps with more useful or interesting functions.

Drawbacks of dapps

dapps promise to solve a lot of the problems faced by regular apps, but they also have some disadvantages.

- **Slow speed** - dApps can sometimes be slow to load, and payments can take a while to process. This adds lagtime to processes and we expect it to be instantaneous. This becomes the sole reason for the business not to rely on decentralized applications.
- **Hacks** - Many dapps are run on open-source smart contracts. Hence hackers can review the code and look for weakness by probing the networks. This may lead to a lot of hacks on popular dapps.
- **Lack of user experience** - A lot of dapps have poor user interfaces. dApps don’t work the same as centralized applications do, and hence its user experience is poor . For example, because dApps are blockchain-based, you would need to use a public and private key to log in, instead of a username and password that you can easily remember or type.
- **Low dapps users** – Like many Web 2.0 apps, if the dapps users are more in number , the more effective the network is at delivering those services. This is referred to as the network effect. Since Dapps struggle from low user numbers, due to poor experience , it makes them less interactive. It can also make them less secure, as a dapp's security is often dependent on user numbers.

Examples of Most popular dapps

Ethereum[30], BNB Chain[31] and Polygon[32] are some of the dapps built on decentralized networks. One can search for details dApps in DappRadar[33] ,a website that list thousands of dapps Details of thousands of dApps built on decentralized networks.

The most popular dApps and the corresponding web 2.0 adpps are listed below.

- From AWS to IPFS
- From LLC to DAO
- From Chrome to Brave
- From your bank to Metamask
- From centralized systems to decentralized blockchains
- From Facebook to Steemit
- From Eve Online to Star Atlas

The normal apps and their equivalent dApps are shown in Figure 9.

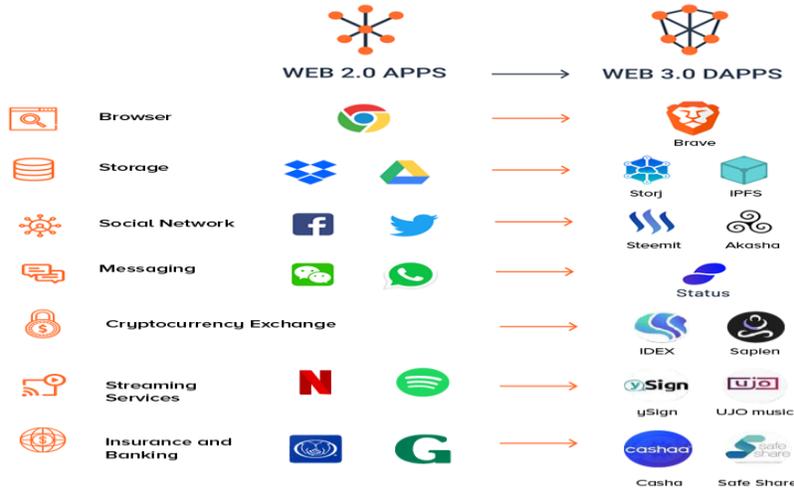


Fig. 9 : A comparison between web2.0 and web 3.0 apps[34]

Decentralized finance (DeFi) and decentralized exchanges (DEXs) are among the most popular dapps that reimagines all financial transactions by removing intermediaries and is based on blockchain typically Ethereum.

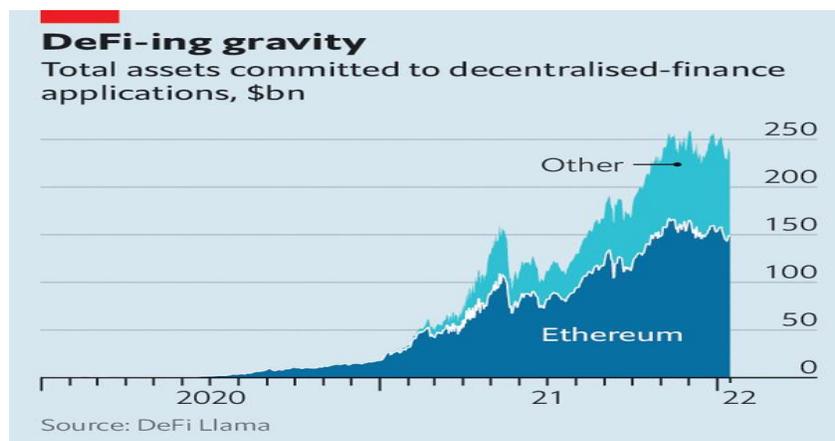
**5.Decentralized Finance**

A key sector in the growth of the blockchain based cryptocurrencies and Web3 is DeFi. The DeFi is also based on blockchains(databases distributed over

many computers/devices and kept secure by cryptography) which can help to replace centralized intermediaries like banks and tech platforms.

In the larger platform of web3.0 which includes social and technological phenomenon, DeFi is a small sector within the wider web 3.0 crypto trend.

Web3 is based on blockchain technology to create a more equitable internet whereas Defi is Web3’s version of a more transparent financial system.



The Economist

Fig. 10: Assets committed to De-Fi applications[35]

The value of assets deposited in Defi system has increased from less than \$1bn at the beginning of 2020 to more than \$200bn in the beginning of 2022 (Figure10).

### DeFi & Web3

Blockchain and Web3 are separate from decentralized finance but they share many similar characteristics. Most notable characteristics are : Permissionless and open, Decentralized, Interoperable, Non-custodial, Programmable, Immutable, cryptographically verifiable and Token-based economic and governance systems [36].

### **6.Web 3.0 & Edge Computing**

In the current Web 2.0 framework, most computing and data storage takes place in centralized data centers located far away from data sources. Web 3.0 takes a different approach by leveraging a decentralized edge computing architecture.

Edge computing involves moving computing and storage functions closer to data sources at the edge of the network. This decreases the distance that data needs to travel, and enables faster processing and decisioning with ultra-low latency[37].

Edge computing is a foundational technology for Web 3.0, and will make it possible to support data-heavy Web 3.0 applications that leverage video, augmented and virtual reality, and AI.

Edge computing is all about delivering online data and services as close to where it's being requested or generated as possible. Edge computing is the opposite of "Big Data" computing in huge , centralized computer centers, whereas edge computing happens at the edges of the network.

For example, data might be processed on your local PC before being sent along to a central location to be aggregated. This means you can combine the processing power of devices along the edges of your network into one giant decentralized supercomputer. With billions of IoT (Internet of Things) devices collecting information in smart homes, factories, and

retail stores, having enough computing power to process that data is a real challenge. Edge computing provides a way to meet those demands, save on bandwidth, and deliver data requests quickly.

The special feature of Edge computing is that the data processing and applications are concentrated in devices in the network rather than existing almost entirely in the cloud.

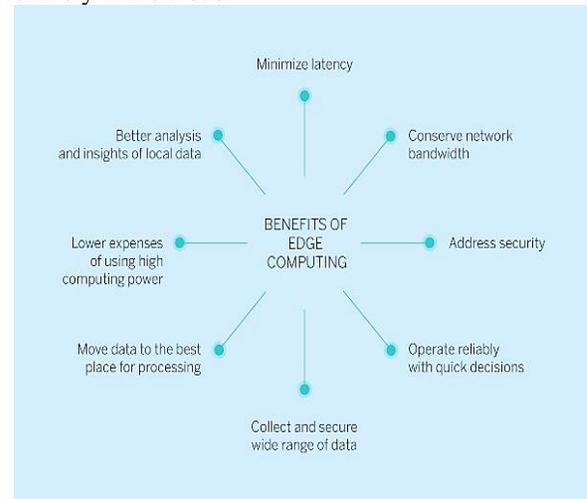


Fig.11: Benefits of edge computing [38]

### **7. Decentralized Autonomous Organizations (DAOs)**

Decentralized autonomous organizations (DAOs) are the main components of web3. An organization, like a business or charity, has a centralized structure. There's command and control from executives and management at every level to coordinate all the different people who contribute to the work that has to be done. A DAO flattens out that entire structure. There is no CEO, CFO, or anything like that. Every member of the organization has a power to voice and decide when money is spent from the treasury and on what[17].

The organization's rules are encoded using innovative contract technology in a permissionless (or trustless) blockchain. DAOs also make it virtually impossible to commit fraud since every transaction and its history is open to public scrutiny.

At a high level, DAOs work as follows.

1. Initially DAO founders create a new cryptocurrency, known as a governance token;
2. Then they distribute these new tokens to users, sponsors and other stakeholders;
3. Each token corresponds to a set amount of voting power within the organization. It also corresponds to a price on the secondary market, where it can be bought and sold at will.

While this process is often described as a way to decentralize power, governance token data suggests that DAO ownership is highly concentrated[39].

**Most common and well-funded DAOs**

- DeFi protocols like Uniswap (\$UNI) and Sushi (\$SUSHI).
- Social clubs like Friends With Benefits (\$FWB) and Bored Ape Yacht Club (\$APE).
- Grant-makers like Gitcoin (\$GTC) and Seed Club (\$CLUB).
- Play-to-earn gaming guilds like Good Games Guild (\$GGG) and Yield Guild Games (\$YGG).
- NFT generators like Nouns (1 NFT = 1 vote).
- Venture funds like MetaCartel and Orange DAO.
- Charities like Big Green DAO and DreamDAO (1 SkywalkerZ = 1 vote).
- Virtual worlds like Decentraland (\$MANA) and Sandbox (\$SAND).

The total value of DAOs in terms of raw numbers and treasury sizes is shown in Figure 12.

From figure 12 it is clear that DeFi-related DAOs have a giant lead. In terms of all DAO treasury values held and by all of the DAOs by count.

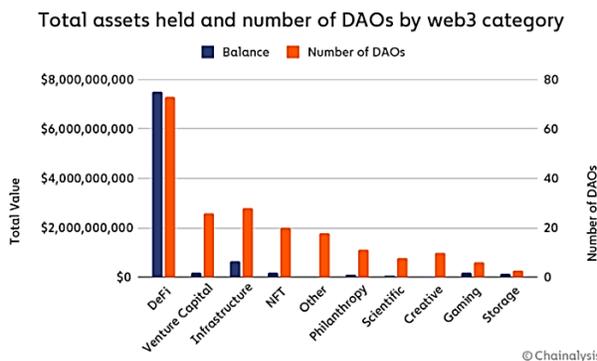
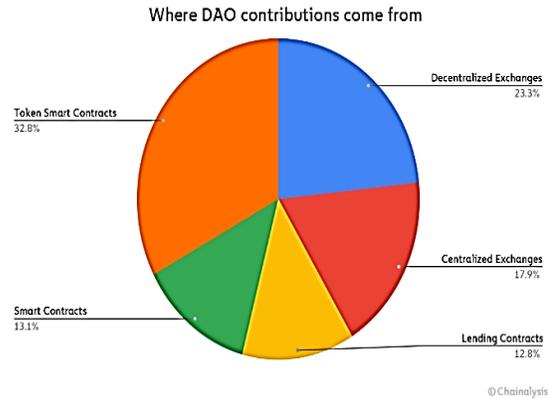


Fig.12: Total value of DAOs[39]

**Sources of DAO contributors- obtained using blockchain data.**



Token smart contract = a project-specific ERC-20 or Layer 1 token contract  
ERC-20 is the technical standard for fungible tokens created using the Ethereum blockchain  
Smart contracts are simply programs/transaction protocols stored on a blockchain that run when predetermined conditions are met.

Fig.13: Sources of DAO contributors[39]

The above pie chart shows that 82.1% of DAO treasury funds came from decentralized services. This suggests that most DAO contributors also engage with DeFi platforms and likely self-host their cryptocurrency.

Of late a large number of DAOs are focusing on venture capital, infrastructure, and NFTs, which suggests that many investors, developers, and artists are interested in DAOs. The type of investments varies depending upon the categories. The type of investments varies depending upon the categories. Gaming DAOs often engage with NFTs, venture DAOs mostly fund DeFi, and infrastructure DAOs support gaming DeFi and all other categories[44]

**VI. CONCLUSION**

In this study, we reviewed how the web underwent various iterations over time to reach the current version we use today. The World Wide Web has evolved from being read-only, where users were merely consuming information from static pages, to its second iteration of a more interactive web, where users could for the first time create and communicate as well as consume, due to the emergence of this giant social platform.

The third iteration of web -Web 3.0 rely mostly on decentralization, it suggests that users would completely own the data generated by them. This helps users or data generators sell/trade the data without having to lose ownership, risking privacy, or even rely on intermediaries. Further, this helps enable users to securely log in without being tracked in any manner. Web 3.0 is a general term for different ideas, all focusing in the direction of eliminating the big middlemen on the internet.

Several layers of technical innovations like cryptocurrencies, NFTs, ,dapps, edge computing, metaverse, DeFi, and DAOs which are housed in the web 3.0 platform are discussed briefly in this review.

Web 3.0 currently is in the early stages of development and adoption by the common users of the web, although this development has been progressing at a steady pace.

We conclude that Web 2.0 has a clear definition that everyone agrees on, which is one of the reasons it has become popular and ubiquitous. Web 2.0 is all about user-generated content, collaboration, and social media dialogue.

But as of now Web 3.0 does not have a clear definition.

Some people believe Web 3.0 is where computers will generate new information, rather than humans. Others feel Web 3.0 is all about the Semantic Web and personalization.

Though we have seen many benefits of web 3.0 in e-commerce, here are still several things to be changed in accepting anonymous purchase handling by decentralized servers. Till now, from what I know, there aren't many eCommerce accepting crypto, and this is to be changed in order to take web

## REFERENCES

[1] Lawal Mohammed Ma'aruf & Khadija Abdulkadir, An overview of e-commerce implementation in developed and developing country; A case study of United State and Nigeria,Int. Journal of Modern Engineering Res.2(2012)3068-3080

[2] Silviu Vlad Mirescu, 2010. "The Premises And The Evolution Of Electronic Commerce," Journal of Knowledge Management, Economics and Information Technology, ScientificPapers.org, 1(2010)1-5.

[3] Albertin, A. L. Comércio eletrônico: da evolução para as novas oportunidades. GVexecutivo, 11(2012), 66-70.

[4] Tian, Yan and Stewart, Concetta, 'History of E-Commerce', In book - Electronic Commerce(2007) DOI - 10.4018/9781599049434.ch001

[5] Fellenstein, C., & Wood, R. 'Exploring e-commerce, global e-business, and e-societies', Upper Saddle River, NJ: Prentice Hall PTR.(2000)

[6] Cassidy, J. Dot.con: 'The greatest story ever sold', New York: HarperCollins.(2002)

[7] Dholakia, N., Fritz, W., Dholakia, R. R., & Mundorf, N, 'Online marketing: An introduction to the e-commerce revolution', Global e-commerce and online marketing: Westport, CT: Quorum Books,(2002)

[8] Costa, E, 'Global e-commerce strategies for small business', Carnbridge, MA The MIT Press(2001)

[9] Md. Golam Rabbi and Md. Shahinur Islam. 'Design and Implementation of E-commerce Site for Online Shopping', Under graduate thesis, Daffodil International University, Bangladesh 2019.

[10] Megalingam R K, Vishnu S, Sekhar S, Sasikumar V, Sreekumar S , Nair T R., 'Design and Implementation of an Android Application for Smart Shopping'. Proc. International Conference on Communication and Signal Processing (ICCSP), India(2019)

[11] Mert Damlapinar, ecommert (2022) <https://www.linkedin.com/pulse/future-e-commerce-after-blockchain-web-30-revolution-mert-damlapinar>

- [12] Darpan Kumari, 'Web 2.0 Vs Web 3.0: The Transition to a Decentralised Web', (2019) <https://medium.com/@kumaridarpan01/web-2-0-vs-web-3-0-the-transition-to-a-decentralised-web-d1d04007737>
- [13] Oyinloye Bosun, 'Web 3.0: The future of e-commerce beyond Amazon, Walmart and Alibaba', Jan 2022 <https://finance.yahoo.com/news/3-0-future-e-commerce-103026133.html>
- [14] Paul Kim, 'Understanding web3: The new version of the web that works on blockchain,' April 2022, <https://www.businessinsider.com/personal-finance/what-is-web3?IR=T>
- [15] Arshia Mojtahedi, 'What is Web 3.0? What are its Promises & Challenges?' AI Multiple. August 2022, <https://research.aimultiple.com/web3/>
- [16] The Global Internet Phenomena Report January 2022- Sandvine, [https://www.sandvine.com/hubfs/Sandvine\\_Redesign\\_2019/Downloads/2022/Phenomena%20Reports/GIPR%202022/Sandvine%20GIPR%20January%202022.pdf](https://www.sandvine.com/hubfs/Sandvine_Redesign_2019/Downloads/2022/Phenomena%20Reports/GIPR%202022/Sandvine%20GIPR%20January%202022.pdf)
- [17] Sydney Butler, '10 Web 3.0 Examples: Is It the Future of the Internet?', Online Tech Tips, March 2022 <https://www.online-tech-tips.com/computer-tips/10-web-3-0-examples-is-it-the-future-of-the-internet/>
- [18] Rakesh Sharma, 'Non-Fungible Token (NFT): What It Means and How It Works', Investopedia, June 2022 <https://www.investopedia.com/non-fungible-tokens-nft-5115211#citation-9>
- [19] NFT in Web 3.0 and The Future of The Internet., Agiratech April 2022 <https://www.agiratech.com/nft-in-web-3-0-and-the-future-of-the-internet>
- [20] Arthur Camara, 'State Of Nba Top Shot', Nbatopspot, February 2021, <https://blog.nbatopshot.com/posts/state-of-nba-tops>
- [21] Elizabeth Lopatto, 'NBA topshot seemed like a slam dunk-so why are some collectors crying foul?', The Verge, June 2022 <https://www.theverge.com/23153620/nba-top-shot-nft-bored-ape-yacht-club>
- [22] "Beeple: A Visionary Digital Artist at the Forefront of NFTs." <https://www.christies.com/features/Monumental-collage-by-Beeple-is-first-purely-digital-artwork-NFT-to-come-to-auction-11510-7.aspx>
- [23] Bybit Learn Team, 'What Is NBA Top Shot: A New Way To Score NFTs', September 2022 <https://learn.bybit.com/nft/what-is-nba-top-shot-nft/>
- [24] <https://cointelegraph.com/nonfungible-tokens-for-beginners/fungible-vs-nonfungible-tokens-what-is-the-difference>
- [25] <https://www.visualcapitalist.com/sp/the-future-of-nfts-in-the-world-of-web-3-0/>
- [26] Henrique Centieiro, 'The Insane Future of Web 3.0 and the Metaverse', DataDrivenInvestor (2012) <https://medium.datadriveninvestor.com/the-insane-future-of-web-3-0-and-the-metaverse-4cec3f13895a>
- [27] Ayushi Abrol, 'Web 3.0 Vs. Metaverse: A Detailed Comparison', Blockchain Council, September 2022 <https://www.blockchain-council.org/metaverse/web-3-0-vs-metaverse/>
- [28] Joseph O'Neill, Matt Hussey and Scott Chipolina, 'What are Decentralized Apps (Dapps)?' Decrypt, April 2022. <https://decrypt.co/resources/what-applications-dapps>
- [29] Stephen Graves and Matt Hussey, 'What is Ethereum (ETH)? A Beginner's Guide to the Smart Contract' Blockchain, Decrypt, April 2022 <https://decrypt.co/resources/what-is-ethereum-quickly-explained-four-minute-guide>
- [30] <https://decrypt.co/price/binance-coin>
- [31] Daniel Phillips, 'What is Polygon (MATIC) and Why It Matters for Ethereum', Decrypt, March 2021 <https://decrypt.co/resources/what-is-polygon-matic-and-why-it-matters-for-ethereum>
- [32] <https://dappradar.com/>
- [33] 'How web 3.0 blockchain Would Impact Businesses?', Appinventiv, March 2022 <https://appinventiv.com/blog/web-3-0-blockchain-impact-on-businesses/>
- [34] 'The race to dominate the DeFi ecosystem is on', The economist, January 2022 <https://www.economist.com/finance-and-economics/the-race-to-power-the-defi-ecosystem-is-on/21807229>
- [35]

---

[36]Cryptopedia Staff, 'What Is the Difference Between DeFi and Web3?', Cryptopedia, June 2022  
<https://www.gemini.com/cryptopedia/defi-and-web3-explained-defi-crypto-options-web3-crypto>

[37]Why Web 3.0's Future Builds on Edge Computing & Blockchain Technology, Zenlayer March 2022  
<https://www.zenlayer.com/blog/web-3-edge-computing-blockchain/>

[38]Ahmed Banafa, 'Edge Computing Paradigm', Technology Digital world, Jan 2022  
<https://www.bbvaopenmind.com/en/technology/digital-world/edge-computing-paradigm/>

[39]Chainalysis Team, 'Dissecting the DAO: Web3 Ownership is Surprisingly Concentrated', Chainalysis, June 2022,  
<https://blog.chainalysis.com/reports/web3-daos-2022/>