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HOUSE VIEW

WEB 3.0 REPORT



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AN INTRO TO WEB 3.0

Web 3.0 is a term that emerged in the 2000s, but it has only gained traction in the last few years. With the surge of bitcoin and blockchain, Web 3.0 is used to describe the transformation of the web towards decentralisation and user ownership. How could Web 3.0 change our existing interactions with the web? How does blockchain fit into the picture?

By Felipe Baptista Giesbrecht

Before we dive deeper into Web 3.0, let us briefly look at how the web developed over time.

WEB 1.0: THE READ WEB (1999-2004)

Originally, the web was envisioned as an open and decentralised architecture that allowed for global information sharing. During the Web 1.0 period, users would mostly consume content from static webpages and user interaction was limited.

WEB 2.0: THE READ-WRITE WEB (2004-NOW)

In the early 2000s, the web started evolving towards user interaction. Forums and social media platforms emerged. Users started being able to share content and communicate openly with each other. With the rise of smartphones, Web 2.0 experienced exponential growth, which resulted in global interaction taking off. Web 2.0 has evolved a great deal in terms of user interface and interaction, but it still has challenges to overcome.

One of them is the lack of ownership users have with respect to their data and content.

Most of the content users produce and upload are on platforms owned by near-monopolies on the web. Another one is economics: a significant share of the advertising-generated profit on websites is held by the same handful of companies, even though the traffic is only due to user-generated content.

Let us clarify this by means of an example, i.e., why do many of us have five messenger apps on our phones? Because Telegram does not allow a message to be sent to WhatsApp, for example. The channel controls the access to the protocol as well as all of the underlying data and uses that data for monetisation purposes (see image below). Bitcoin, however, is different: all of the protocol data is open and accessible by anyone, and anyone can build an app that is interoperable with other apps (i.e., one can send bitcoin from a Coinbase wallet to a Trust Wallet).

Closed, permissioned system

Dedicated Apps



Permissioned Protocol Access



Single ownership and access of data



Open, permission-less system

Free of choice App



Open Access



Public ownership and access of data



WEB 3.0, THE READ-WRITE-OWN WEB

Web 3.0 is a vision of the third iteration of the web. At its core, it envisions a more decentralised web that introduces new user ownership and economic incentives. Everything incentivises users to earn, e.g., the internet browser Brave distributes ad revenues to users directly into their wallet instead of giving it to Google.

The evolution to digital ownership

	Web 1.0 Static	Web 2.0 Dynamic	Web 3.0 Decentralised
Read	YES	YES	YES
Write	NO	YES	YES
Own	NO	NO	YES



HOW COULD THIS VISION COME TRUE?

The invention bitcoin brought created uniqueness in a digital form without trust in a central intermediary for verification. For example, if a user takes a picture with their phone and sends it to someone, there are then two copies of this image (= Web 2.0). Data can be copied endlessly, and therefore the value goes to 0. But bitcoin changed this, as it managed to create unique data that could not be copied. This concept enables us to express value in a digital form for virtually anything. Whether it is land in the metaverse or a token of ownership of a real painting. Hence, blockchain and digital assets play a key role in turning the vision of a decentralised Web 3.0 into reality.

Web 3.0 envisions a more decentralised web that introduces user ownership and economic incentives.

WEB 2.0 VS. WEB 3.0 METAVERSE

“The metaverse” does not exist yet – a number of virtual worlds calling themselves metaverses have been created (i.e., Decentraland, Horizon, and the Sandbox). The vision of “the metaverse” would connect several virtual worlds so interaction can take place. Therefore, we need a protocol such as TCP/IP, which enables different servers to communicate with each other through a widely accepted standard. The same way that every webpage can be rendered by a single browser.

At the moment, all “metaverses” only exist by themselves and are not able to talk to other virtual worlds. Let us look at some practical examples. Versions of digital worlds exist since the late 1990s. In the 2000s, many of the widely known Web 2.0 metaverse titles like “Second Life”, “EVE Online”, “World of Warcraft”, “Roblox”, and “Fortnite” appeared.

What do these early metaverse examples have in common? Users spend a significant amount of time in their lives investing in their digital identities inside of these worlds. They accumulate assets, create content, and cultivate social relationships. The users, however, do not in fact own any of these hard-earned digital assets. If the responsible company for the respective virtual world were to shut down their servers, everything created in this alternative world would simply be gone. This was the case for innumerable gaming metaverse examples in Web 2.0: Star Wars Galaxies, Warhammer Online, Little Big Planet, and many others.

How could the metaverse look like in Web 3.0? Let us assume that the economics of a specific virtual world works based on cryptocurrencies and non-fungible tokens. Users could connect their blockchain wallets when entering that virtual world. All the assets stored in the connected blockchain wallet could be verified and, if compatible, take a digital form or give specific rights. Additionally, assets and digital money earned in that world would automatically be transferred to that wallet. Should the virtual world ever cease to exist, the wallet would still be a proof of ownership of these assets. This has the potential to enable an interoperable metaverse, which would make it possible for users to take assets over to other virtual worlds. Goldman Sachs puts it as follows: “... the global internet is in the middle to late innings of the innovation curve of Web 2.0 and the leaders of this wave of internet are now firmly established. In framing the next wave of computing (Web 3.0), we see the potential for dramatic shifts in industry structure...”.

THE METaverse – BEYOND THE HYPE

Today, there is a great deal of hype around the “metaverse” and the vision of a decentralised Web 3.0. Mitchell Goldberg, PhD Candidate at the University of Basel, clears up some common misconceptions about the metaverse, elaborates how blockchain technology can power the next generation of the internet, and explains where the dream of the decentralised web might encounter challenges.

Mr Goldberg, when people hear the term “metaverse” today, they probably have a picture of video games and VR glasses in mind. Could you tell us what the metaverse actually is and also what it is specifically not?

The term “metaverse” was first introduced in a science fiction novel called “Snow Crash” (N. Stephenson, 1992) where it describes a virtual environment that emulates physical space and is populated by humans-as-avatars (human-controlled virtual characters). In a way, the metaverse enables social and economic interactions through the internet that give the users a feeling of presence. Using this definition, a lot of today’s online multiplayer games and social virtual worlds would qualify as a “metaverse”.

However, the future of the metaverse may exceed today’s platform-based system by creating a more immersive version of the web, i.e., something that is ubiquitous and can be accessed through many different devices and clients. Moving from one virtual space to another should be as simple as clicking on a link.

A lot of people assume that the metaverse requires VR glasses, but that is not necessarily true. Of course, these headsets may create a more realistic experience, but that does not mean that non-VR virtual worlds cannot be part of the metaverse. Most importantly, the opposite is not true either: not every VR application is part of the metaverse, e.g., watching a movie through a VR headset may create a much more immersive experience, but it does not enable social and economic interactions with other humans-as-avatars in a virtual environment. The metaverse is all about connection.

Virtual worlds have already existed for many years. Online games have just recently started to brand themselves as metaverses. What is different when we talk about metaverses today / in the future compared to the digital experiences before?

I would say it is a story of “new wine in old bottles”. Virtual worlds have existed for decades, but technology and society have evolved. It has become feasible to visualize virtual 3D spaces in a more realistic way, we can share data much faster through the internet, crypto has enabled developers to create novel digital assets that can actually be managed by their owners and, last but not least, it has become socially acceptable to spend more time on the internet or to play video games with friends and strangers. Users of virtual worlds are no longer labelled as “nerds” and treated as outsiders.

Which roles do blockchain and NFTs play for the metaverse and how is it all connected to the term Web 3.0?

Web 3.0 is a set of tools and protocols that aim to decentralise the web as we know it. Instead of having to trust a single platform operator, users can now participate in open, permissionless systems that build the backbone of a new web.

From a technical perspective, the metaverse does not require Web 3.0, but there are good reasons why cryptoassets and more distributed power may be beneficial for the end-users and firms who engage in the metaverse [2]. For example, crypto assets on public blockchains are interoperable by nature, i.e., the same assets can be integrated by developers of different platforms. Furthermore, users and firms are able to evaluate the execution environment and code that creates these digital assets before they interact with them.

We often hear that Web 3.0 will be decentralized and hence superior to the current centralized Web 2.0 run by digital oligopolies. Can you share your thoughts on the decentralisation of the internet? What challenges lie ahead?

Web 3.0 is an opportunity to mitigate problems that are inherently part of today's web. Essentially, the web consists of different platforms. The operators of these platforms control the digital lives of their users which puts them in a position of immense power. They can unilaterally change the rules of their platform and enforce these rules themselves. Users and businesses that rely on these platforms are at risk of being exploited, e.g., through rent seeking. [Editor's note: Rent-seeking refers to the pursuit of economic gain by manipulating market rules and regulations, rather than by improving the quality or efficiency of goods or services.]

Web 3.0 tries to distribute this power among the users, but there are a few shortcomings. The crypto space is highly innovative, but a lot of people are not familiar with its basics. This has led to scams and, depending on the jurisdiction, unclear regulation. In my opinion, the biggest challenge is to enable innovation while protecting consumers. This can potentially only be overcome by educating the users and regulators.

You did research on the virtual world of Decentraland. There you showed higher land prices are paid for virtual property with more expected visitors. Is the metaverse all about attention or are there other benefits?

It really depends on the definition of the term "metaverse". If you think about AR/VR applications as a whole, there are many other benefits, e.g., for teaching or e-commerce. But if you look at the "metaverse" as a 3D version of the web or a virtual space where people meet, it mainly is an attention economy [1]. Landowners have a financial interest to own land on platforms which attract the most users because it gives the highest value to commercially driven firms who would like to engage in the metaverse. But even within a specific platform there can be differences between locations in terms of value. Some parcels and regions may attract more visitors than others, and thus, they are more valuable in this attention economy.

When you think ahead, what are you most excited about?

I'm more concerned than excited about the future of the metaverse and Web 3.0. Most proponents exaggerate and overpromise when it comes to the future of the space. On the other side, opponents often highlight the scams and push for regulation. I hope – and this would really excite me – that we can resolve this challenge. Not everything is bad about Web 3.0 and the metaverse, but there are some issues. Hopefully, as more and more people get a better understanding of the fundamentals, we can find a way to solve the problems of today's web to create a fair and interesting metaverse for everyone.



Mitchell Goldberg

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Mitchell Goldberg is a PhD Candidate at the University of Basel who conducts research in the area of blockchain and the economic aspects of the metaverse. His recent working papers focus on the valuation of land in the metaverse and governance of the metaverse through Decentralized Autonomous Organizations (DAOs).

Referenced papers:

[1] Goldberg, Mitchell and Kugler, Peter and Schär, Fabian, Land Valuation in the Metaverse: Location Matters (September 29, 2021). Available at SSRN: <https://ssrn.com/abstract=3932189> or <http://dx.doi.org/10.2139/ssrn.3932189>

[2] Goldberg, Mitchell and Schär, Fabian, Metaverse Governance: An Empirical Analysis of Voting Within Decentralized Autonomous Organizations (December 23, 2022). Available at SSRN: <https://ssrn.com/abstract=4310845> or <http://dx.doi.org/10.2139/ssrn.4310845>



BUILDING BLOCKS & BEYOND: NFTs & SBTs

As we move towards a decentralised Web 3.0, non-fungible tokens (NFTs) have emerged as an essential component in realising this vision. NFTs are unique digital assets that have a wide range of potential uses and applications.

By Vanessa Thien

EXPLORING THE UNIQUE QUALITIES OF NON-FUNGIBLE TOKENS

NFTs are unique digital assets on the blockchain. Different from cash or cryptocurrencies, such as bitcoin and ether, an NFT cannot be interchanged with any other NFT. Even two NFTs with the same image are uniquely represented on the blockchain and cannot be replaced or exchanged with each other.

A prevalent misunderstanding is that NFTs are restricted to representing digital images only. In fact, they can be utilised to certify ownership of a wide range of assets, including land titles and digital collectibles. Additionally, NFTs are increasingly being deployed in gaming and metaverse applications, such as virtual real estate, in-game items, virtual characters, digital art, music, and video. NFTs have the potential to be applied in various industries and sectors, highlighting their versatility as a technology.

While Ethereum has traditionally been the go-to blockchain for NFTs, other platforms like Solana have been gaining market share due to their lower transaction fees and better scalability.

However, Ethereum remains the dominant blockchain for NFTs, with many of the most highly-valued and widely-collected NFT projects, such as CryptoPunks and Bored Ape Yacht Club, being built on the Ethereum network. This is due to the extensive and active developer community, as well as the wide range of tools and resources available for creating and minting NFTs on Ethereum.

Different from digital items such as an image that was sent via email, NFTs represent ownership of the asset.

A NEW TYPE OF NFT: THE SOUL-BOUND TOKEN

As blockchain technology evolves, so do the types and functionalities of tokens. A particularly interesting new class of NFTs emerged in 2022, coined by Ethereum Founder Vitalik Buterin: soul-bound tokens (SBTs).

SBTs are a type of NFT that represent individuals' identities in a decentralised digital world. Unlike traditional NFTs, SBTs are not designed for speculation and have no monetary value. Instead, they are non-transferable and focus on the utility of the token for personal identity verification. This approach moves away from the "hyper-financialisation" of NFTs.

SBTs are not expected to replace NFTs. Rather, they will most likely co-exist, solve different problems, and serve different functions.

Soul-bound tokens can be used for identity verification, allowing individuals to prove who they are in order to access sensitive information or services online. SBTs also give individuals control over their personal data and identity, without relying on centralised authorities or institutions. Additionally, they can be used as digital identities for the unbanked, giving people without access to traditional forms of identification a way to prove their identity and access financial services. In social media, SBTs can be used to prove the identity of the creator of a social media post or account, reducing misinformation or impersonation while giving people control over their own personal data and identity.

Despite being a new development, SBTs are not expected to replace NFTs. Rather, they will most likely co-exist, solve different problems, and serve different functions.

NFT	VS	SBT
Represents assets or property		Represents identity or reputation
Transferable		Non-transferable
Prone to speculation		Detached from speculation
Tends to have monetary value		Designed to have no monetary value

AUTOMATED AUCTIONS VIA DAO, E.G. NOUNS



In contrast to the limited release of 10,000 NFTs, Nouns.wtf is a decentralised autonomous organisation (DAO) that releases one NFT (known as a Noun) per day, indefinitely. Each day, an automated auction is held to determine the owner of the newly minted NFT. Despite the current crypto winter, the project has maintained its momentum and popularity, with each Noun auctioning for around 30 ETH.

NEW BUSINESS MODELS POWERED BY NFTS

One of the most exciting evolutions is the possibility to develop new business models. With the key features of non-fungibility and immutable data, here are three examples of how NFTs are being leveraged by developers and their community :

LIMITED EDITION COLLECTIBLES, E.G. CRYPTO PUNKS



The team behind CryptoPunks is widely recognised for developing the NFT standard that we know today, and for inspiring the common way to mint NFTs. Using 10,000 algorithmically-created characters, each with a mix of attributes and varying degrees of rarity, the team minted them as tokens on the Ethereum blockchain. These unique characters can be easily verified for legitimacy, as the information about their creator, collection, and minting time is recorded on the blockchain and is immutable.

Due to their exclusivity and uniqueness, CryptoPunks are essentially limited-edition collectibles. As more digital experiences and platforms are built on top of the Ethereum blockchain, holders of CryptoPunks may have the ability to participate in these experiences in unique ways or even have their CryptoPunks featured in them. Furthermore, NFT marketplaces such as OpenSea allow creators to establish a unique revenue stream through commission earned on transactions from the secondary market.

Typically, early adopters have an advantage in acquiring new NFTs. Nouns.wtf, however, flips this script by offering an ongoing mint of NFTs, allowing late adopters to also have a chance to acquire a piece of the collection. It is worth keeping an eye out for the new ways in which this innovative approach to minting, releasing, selling, and governing NFTs, and its collection's committee will evolve.

ENHANCED CONSUMER ENGAGEMENT THROUGH POAP TOKENS

Proof-of-attendance protocol (POAP) tokens are similar to SBTs in that they are also a relatively new development. POAP tokens allow NFT holders to record their attendance at events permanently. This concept is commonly used by businesses to track and reward their customers based on their level of engagement.

A notable example of POAP in action is CryptoSlate by CoinDesk, which uses POAP tokens to reward conference attendees for their participation. Another example is the Adidas Originals, which uses POAP tokens to reward customers for their engagement in the metaverse. Additionally, the US Open in 2021 also adopted POAP tokens to reward fans for their engagement and attendance. POAP tokens are a way to increase customer engagement, reward them for their loyalty, and track their activities.

CONCLUSION

NFTs have significant untapped potential, serving as the building blocks for Web 3.0. This is evident in the various ways they can be used to create new concepts such as SBTs and POAP, and the various business models that can arise from simple NFTs, such as Crypto Punks and Nouns. As NFT technology is still in its early stages of development, many projects are experimental and primarily used for games and digital experiences. However, as the possible business and operating models mature, there is a significant opportunity for corporations and companies to leverage NFTs and SBTs to enhance their business models and improve customer retention.

BLOCKCHAIN GAMING: CATALYST FOR MAINSTREAM ADOPTION?

Since the inception of Bitcoin, which popularised the idea of decentralised ledger technology and cryptocurrencies, the digital asset industry has been searching for new blockchain-based applications that can differentiate themselves from this Peer-to-Peer Electronic Cash System and further drive mainstream adoption. The technology behind blockchain and digital assets has long been focused on redefining the future of finance, whether it be by relying on a decentralised ledger to record peer-to-peer transactions, or by interacting with DeFi protocols and instruments. Yet, the scope of blockchain technology is broadening and other traditional industries will be impacted, such as gaming.

By William Ery

TRADITIONAL GAMING IN A NUTSHELL

Gaming, or in this context traditional gaming, consists in a person playing an electronic video game, most often developed by large companies, such as Electronic Arts, Epic Games, Sony, Microsoft, Nintendo, Tencent, or Activision Blizzard. The gaming industry has largely adopted a centralised model for data storage and management. Under this model, all data related to a game, including player account information, in-game assets and currencies collected by players, and server history, is stored in databases controlled by the game's administrators.

In 2021, the gaming industry generated more than \$200 billion in revenues. In comparison, the film industry market size was valued at around \$90 billion, and the music industry was worth \$26 billion. Whether it be with mobile, PC, or console games, players spend their money and time on video games because, let us be honest, games are fun. Players enjoy the freedom, the competition, the relaxation, the excitement, the challenge, and a multitude of other feelings they may experience while gaming. These are just some of the reasons why the gaming industry could surpass \$300 billion in revenues by 2026.

In 2021, the gaming industry generated more than \$200 billion in revenues. In comparison, the film industry market size was valued at around \$90 billion, and the music industry was worth \$26 billion.

In a nutshell, gaming is a fun and booming industry that attracts billions of players via mobile, PC, or console every year, and it just so happens that blockchain technology might have a way to make the whole thing even better.

THE RISE OF BLOCKCHAIN GAMING

The possibility to create applications on top of blockchains, has led to the emergence of a new trend known as blockchain gaming.

It allows players to own and trade digital assets, represented as NFTs within a video game. The rise of blockchain gaming offers players new benefits, such as the retention and control of in-game assets and currencies, and the possibility of moving in and out of games with those assets.

Gaming activity made up for about a half of all unique active wallets (UAW) in the decentralized application space, ahead of DeFi, throughout 2022, according to DappRadar and BGA. Alien Worlds and Splinterlands are amongst the most popular games with around 200,000 daily UAW each. Axie Infinity is notorious for having popularised the “Play-to-Earn” concept, allowing players to collect, breed, and battle fantasy creatures called Axies, which are represented as NFTs.

Gaming represented more than half of decentralized application activities in 2022.

THE MERITS OF DECENTRALISED GAMING

There are many benefits that blockchain and decentralisation offer to gamers: from player “ownership”, in every sense of the word, to the creation of novel decentralised “gaming economies”, and from the development of new types of games, to the emergence of a multi- or metaverse interconnecting gaming ecosystems with each other. The industry in general, and game developers more specifically, can also profit from the rise of blockchain gaming. For developers, blockchain technology offers new ways to build, earn, and interact with their community, while the digital asset industry will benefit from mainstream adoption thanks to gaming.

Scarcity, or more precisely “provable” scarcity, represents one of the main benefits put forward by blockchain gaming. NFTs, used to represent in-game items, allow players to have increased ownership in their favourite game and to extract real value from their hobby. This concept can be viewed through the wider lens of the progressive move from Web 2.0, in which Big Tech owns user data, towards Web 3.0, in which the users own their own data. Blockchain and gaming seem to fit together perfectly, as in-game items represented by NFTs act as proof of digital ownership, which is verifiable on a public and distributed ledger. This power shift offers a whole new experience in which games evolve into decentralised “gaming economies”.

Blockchain technology has expanded these gaming economies on a mass scale, making them more robust and easier to develop. The implementation of NFTs in games creates decentralised digital economies that reward users for engaging with the game. Players can choose to “rent” tools or characters from experienced players for monetary compensation, and owners of virtual properties in blockchain games can also earn money by renting them out to other players.

The assets that players own within the game, which they have bought or earned, cannot be removed or taken away by anyone. This is an issue that traditional gamers still face today. For example, earlier this year 60% of Madden NFL 23 players, a popular American football video game developed by EA, lost their in-game files. This was due to a “temporary data storage issue,” which led to the corruption of the games save files.

Blockchain technology and digital assets also enable new types of games to emerge, such as the Play-to-Earn concept, popularised by blockchain projects, such as Axie Infinity. This new game type enables players to acquire tokens or assets by achieving specific goals, such as completing a level or a challenge. These tokens obtained within the game possess real-world value and can be utilised for various purposes, such as buying NFTs, exchanging them for other cryptocurrencies like bitcoin or ether, and can even be used to purchase tangible assets.

The concept of Play-to-Earn lets players acquire tokens for achieving in-game goals. These tokens possess real-world value and can be utilised for various purposes.

Over time, the appearance of the metaverse could end up looking like a large ecosystem where numerous games are interconnected in which players can transfer in-game items and currencies by following certain rules established by blockchain game developers. In fact, developers can also benefit from the novel aspects offered by decentralised gaming by leveraging new ways to create games, earn by participating in the game’s decentralised economy, and by interacting with their community to build games to their liking.

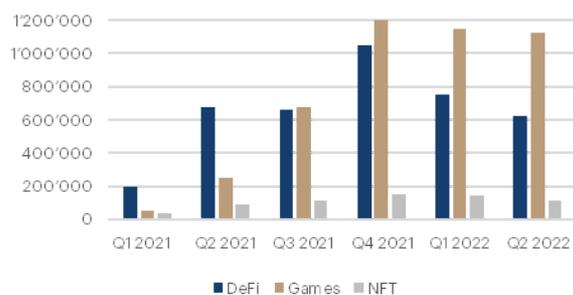
COULD BLOCKCHAIN GAMING BE THE CATALYST FOR THE MASS ADOPTION OF DIGITAL ASSETS?

The merits of blockchain gaming exposed above substantiate the argument that it might be a major catalyst for the mainstream adoption of digital assets. As previously mentioned, gaming represented more than half of decentralized application activities in 2022.

Blockchain gaming also proved to be resilient during one of the toughest years ever experienced in the digital asset industry. Despite the collapse of FTX in November, the decentralised application industry continued to be propelled by blockchain games. The funding of blockchain games also remained strong during 2022.

According to DappRadar, \$1.3 billion were raised in Q3 by blockchain games and metaverse projects. Ultimately, the entire digital asset industry could benefit from such gamification effects. Gaming has the power to draw in a new crowd of users who are interested in playing novel and fun games, participating in decentralised economies where they control their in-game assets, and experiencing what a tangible application of blockchain might feel like.

Quarterly average UAWs for categories



Source: Crypto Finance, DappRadar

CURRENT LIMITATIONS

Blockchain gaming does face some limitations. The promise of blockchain gaming is to be a community-driven, technologically innovative, player-ownership-based decentralised system. In reality, most “blockchain” games are built without real blockchain gameplay (they sometimes simply integrate NFT trading), and there is still no efficient way to store data on-chain. Gas and processing fees are high for users, and there is limited NFT utility. According to FYX Gaming, which develops blockchain games such as CryptoFights, the industry is also facing challenges to scale, and the core technology, i.e. the blockchain, on top of which a game is deployed is crucial for its development. In addition to a lack of high-level gameplay and issues with the scalability of blockchains, there is ultimately still a lack of demand from the public and a lack of resources allocated to developers, which would allow them to compete with traditional AAA game developing powerhouses.

OUTLOOK

Ultimately, blockchain gaming needs to reach a point where players experience a game without even knowing that it has been developed and is running on a blockchain. The gameplay and excitement created by the game itself need to attract players to play, while the novel aspects offered by blockchain and digital assets need to make them stay.

According to CoinMarketCap’s latest report on the subject, the blockchain gaming market has been stagnant in terms of pricing and adoption, and the older generation of games is declining. However, there is potential for growth in the future. Blockchain gaming still has a long way to go for mass adoption, as seen in the low numbers of Unique Active Wallets relative to traditional gaming, NFT transaction volumes, and the number of blockchain games out there.

For blockchain gaming to succeed, the gameplay and excitement created by the game needs to attract players to play, while the novel aspects offered by blockchain and digital assets need to make them stay.

Ethereum holds the majority of the blockchain market share, but other platforms are competing to be the top choice for game developers. The current trend is moving towards the third era of games, which will prioritise fun, and use scalability solutions while avoiding economic flaws. Overall, the focus is shifting to blockchain gaming studios that can produce engaging content that makes use of blockchain gaming infrastructure.

Extending on the “era” theory developed by CoinMarketCap, it is reasonable to believe that the “end-game era” will likely see the emergence of AAA games ecosystems, which offer impeccable gameplay, are entirely built on the blockchain, leverage NFTs, give control and asset ownership to the players, and allow them to navigate between games.

Considering blockchain gaming, there are many more topics to develop on, such as soul-bound tokens, the revolutionary opportunities enabled by Smart NFTs, i.e. NFTs which “evolve” when certain conditions are met (similar to that of smart contracts), and the emergence of what many believe will rule our future, the Metaverse.

CONCLUSION

Gaming already represents 50% of decentralised application activity - more than any other in 2022. In addition, during tougher market conditions, gaming has proven to be more resilient than DeFi, for example. NFTs can disrupt how games are “played”, but also, and perhaps more importantly, how games are “owned”. With blockchain gaming, players have the opportunity to provably own in-game assets and currencies, participate in novel gaming economies, and soon enough move in and out of games within a larger ecosystem. If blockchain gaming can prove to be a real catalyst in terms of the mass adoption of digital assets, there will still be limitations to consider, such as the lack of quality gameplay, issues with scalability (which vary in severity depending on the blockchain), the shortage of public demand, and ultimately the shortfall in resources needed to develop AAA decentralised blockchain games. Overall, the future of blockchain gaming seems bright, and the “real-world utility,” which many still seek, could be found in the next blockbuster blockchain game!

VALUE ACCRUAL FOR WEB 3.0 TOKENS

An important aspect when analysing any investment opportunity is to understand its underlying economic model and value accrual mechanism. For crypto and Web 3.0, for example, this means that even if the underlying technology is groundbreaking, it still requires a clear economic model in order to be a great investment. When analysing the various use cases, from NFTs to gaming, we believe that value accrual in Web 3.0 could be fundamentally different than the economic models of the past decades. We see potential for a shift away from concentrated power centres towards a more democratised value distribution.

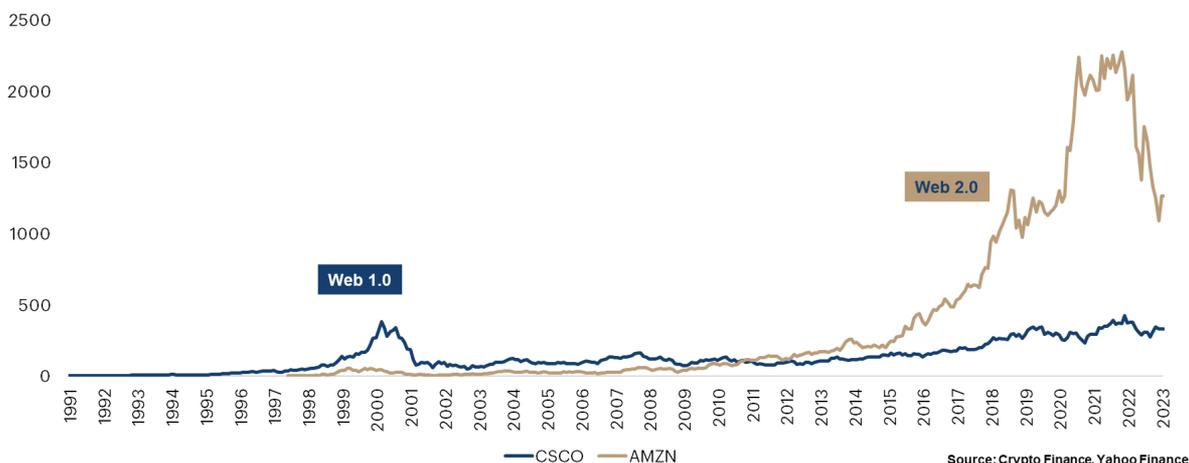
By Friedrich Herzog

WEB 1.0 TO WEB 2.0 EVOLUTION AS CONTEXT

The internet was certainly a groundbreaking invention, but how valuable are HTTP or TCP/IP from an investment perspective? Ignoring the fact that they are not investible in the first place, it is unlikely that anyone would be willing to pay much for these protocols today given their open-source nature. They have become a free commodity, with no barriers. Another aspect when assessing a new technology's value accrual is how it changes over time. In the early days of the internet, before the 2000 dot-com collapse, it was extremely valuable to invest in Web 1.0 companies, such as infrastructure and/or hardware providers (one example in the charts below is CISCO).

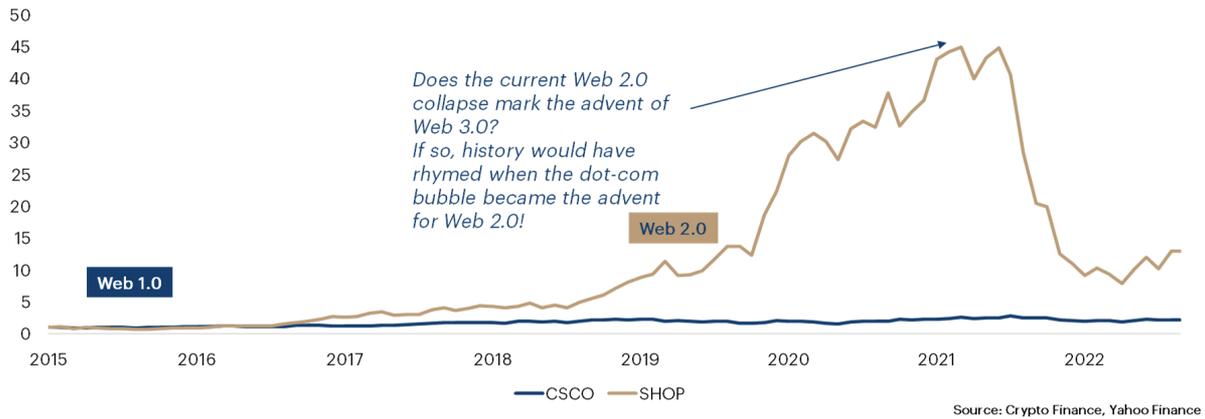
However, as time progressed and the internet transformed towards Web 2.0, companies like Google and Amazon emerged and replaced the pre-2000 favourites. As of today, some of these Web 2.0 companies are the highest valued companies in the world, and Web 1.0 companies have taken a back seat. Therefore, it is important to understand how, and where, value accrues at any given point in time. Digital assets will be no exception. As we venture through the different stages, from early technological innovation towards broader adoption, each epoch will likely have its unique winners and losers.

Growth of \$1 Amazon vs Cisco



Source: Crypto Finance, Yahoo Finance

Growth of \$1 Cisco vs Shopify during the Web 2.0 boom years, until the recent collapse of the technology sector



WHERE IS THE VALUE ACCRUAL IN WEB 3.0 TODAY?

One of the original Web 3.0 theses was the so-called “fat protocol thesis,” which highlights a transition from value accruing at the application layer as in Web 2.0 (think: Google as the application running on top of HTTP as the protocol layer) to value now accruing at the protocol layer (e.g., Ethereum). However, this hypothesis did not hold true over time, and there is an emerging sector of applications that accrue significant value on top of the protocol layer (e.g., NFT marketplaces such as OpenSea). This value accrual mechanism is in turn time dependent. As mentioned above, every phase in the Web 3.0 (r)evolution will have its own winners and losers, and it is therefore important for investors to always understand the current dynamics of the value accrual path.

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To exemplify the current state of Web 3.0, below is a list of example protocols and projects that outline where (and to whom) the value currently accrues.

Protocol	Description	What fees/revenues are generated?	Value accrual: who receives the fees?	How does the token/coin have value?
Ethereum	Layer 1 smart contract platform enabling the development of dApps	Transaction fees	Validators and stakers	Token holders by virtue of proof-of-stake consensus receive a fee share as a reward
Uniswap	Decentralised exchange running on top of Ethereum	Transaction fees	LPs within the liquidity pools	Tokens do not directly accrue value but carry option value for future governance changes
OpenSea	Centralised platform and marketplace for NFTs	NFT sales	NFT issuers; approx. 33% retained by OpenSea	No tokens, just a marketplace; value accrual exists at the NFT level and at the company level
Bitcoin	Decentralised medium of exchange (currency)	Transaction fees	Miners	Network value; no direct value from fees as those go to miners

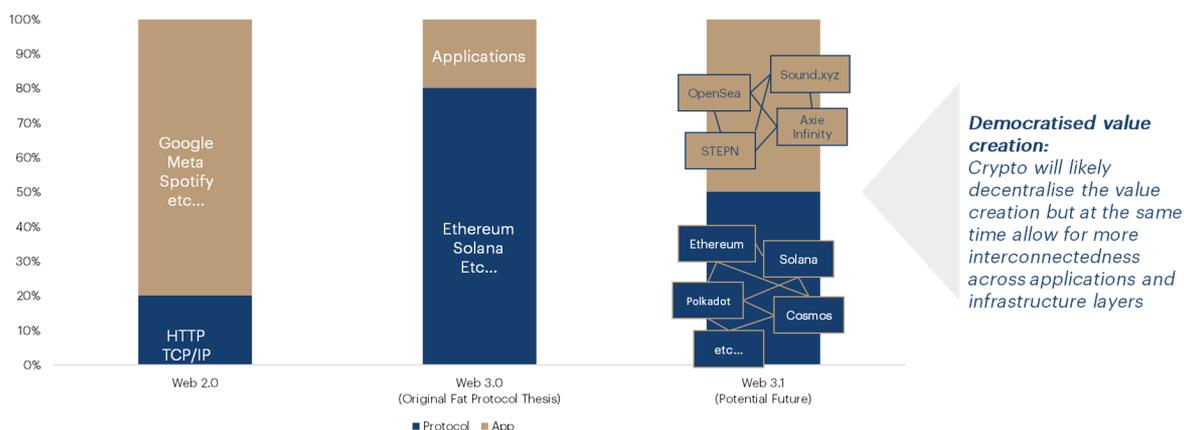
VALUE ACCRUAL IN THE FUTURE

In a stylised Web 3.0 world, we could imagine a future where there is more distributed and therefore democratised value accrual across the infrastructure and application layers, as depicted in the graph below. This would not be a contradiction to the “fat protocol thesis” but rather an evolution towards a more balanced value distribution, with protocols still capturing a large portion of the value, but not necessarily the majority.

Given these complex, time-variant value accrual dynamics, and the ever-changing market environment, it is important to keep the finger on the pulse of technological progress and its applications. Value accrual in Web 3.0 will be fundamentally different from the economic models of the past decades. We are in the early stages of this shifting environment, which, of course, comes with high levels of uncertainty but at the same time with immense opportunities. The prospects for the future of Web 3.0 are truly exciting!

Value accrual in Web 3.0 will be fundamentally different from the economic models of the past decades.

Evolution of what the Web 3 future could look like



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