White Paper

Introduction to Web3 and the Metaverse

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Introduction

There's change coming. Much like the introduction of the internet almost 30 years ago, there is a new movement that is gathering pace and accelerating at such speed that it will quickly threaten the current digital and business landscape. Those who understand and appreciate the magnitude of this change - the Web 3.0 revolution can stand to benefit. Similar to those who embraced the internet (Web 1.0) back in the 90s and the social media era (Web 2.0), first-movers will have a clear advantage with fortune almost certainly favouring the brave.

When the internet was launched for mainstream audiences, there were many who believed that this was just the beginning. Technology would certainly evolve and even if we'd never heard of terms such as 'broadband', dial-up modems would (hopefully) be a thing of the past. But even then, despite slow internet speeds, we saw a glimpse of the future. Emails replaced postal services; access to the latest news and information were at the touch or two of a button and live communication in general, across international boundaries, were faster than ever. The dotcom boom followed shortly after with companies clamouring to be a part of the initial revolution. While many failed, some such as the likes of Amazon and Google flourished. Of those that failed, some were simply down to being too early - Pets.com being a prime example of this. The dotcom bubble burst shortly after the failure of a number of businesses with many pessimists claiming victory in their view that the internet was a 'fad' and that the future did not involve a connected world wide web consisting of machines and people across the globe.

However, by the time the Web 2.0 era came into play, the internet was fully in play, used by millions of people around the world with corporations and individuals alike, embracing the technology. According to the Pew Internet Project survey in December, 2005, pre-2006, the majority of internet surfers who accessed the web were under the age of 30 - whether this be for work purposes or to simply pass the time.[1] Fast forward 15 years and the spread of internet users by age was significantly more evenly distributed with 50% of global internet users aged 35 or more.[2] More importantly, the number of internet users[3] had increased from approximately 1 billion to 4.5 billion people during this time. We need to appreciate that Social Media platforms such as Facebook and Twitter played an important role in this progression with user-generated content forming the backbone of increased connectivity and communication between the online audience together with the acceleration and increased adoption in mobile technology driven by smartphone adoption.

[1] https://www.pewtrusts.org/-/media/legacy/uploadedfiles/wwwpewtrustsorg/reports/society_and_the_internet/pipsurf0206pdf.pdf

[2] https://www.statista.com/statistics/272365/age-distribution-of-internet-users-worldwide/

[3] https://ourworldindata.orginternet#:~:text=Globally%2C%20the%20number%20of%20Internet,from%20each%20country%20are%20online%3F

It's taken us 30 years or so to reach this point, and much of this time was taken developing core technology. Constant invention coupled with innovation was required to advance online possibilities. When Facebook was launched in 2004, desktop / laptops were the only way of accessing the platform, while today, 98.5% of Facebook users access the platform via their mobile devices.[4] So while progress has been fast, there has been the constant need to develop technologies that match the requirements of the platforms that rely on it to drive further growth and user engagement. This is a significant point for a number of reasons. The first is that technology was developed in accordance with the specific requirements of individual companies. A centralised and very concentrated group of businesses that seemingly control and monetise aspects of the web, driven by user engagement and data. Billions of dollars have been invested by these companies for this purpose. While this questions the integrity of corporation-led innovation, the fact remains that there was a 'innovate as we go along' methodology employed by the likes of Facebook and Google, which remains the case today, albeit now much more aligned to strategic business goals compared to the early days of their existence. The second and perhaps most important point is that today, data custody isn't in the hands of internet users and worryingly, in the hands of large corporations who continue to monetise each user for financial gain. The challenge with this, is that the internet today is policed by corporations who decide what content should be shown or not shown to its audience, something that compromises the early ideologies of the internet from three decades ago.

Web 3.0 challenges this version of the internet and in some way is trying to solve the problems caused by this with the decentralisation and democratisation of the internet being the ultimate goal of Web 3.0 advocates. Taking power away from large organisations and to some extent, financial institutions and governments on the basis that current laws and practices are vastly outdated is also a part of this. Giving individuals power using secure technology as a transparent mechanism for this is another important factor. Unlike the early Web 2.0 days when social media platforms were coming to the forefront, the technology that underpins Web 3.0 already exists. While it may require refinement, very little innovation or new inventions are required to make Web 3.0 a very real possibility today, which is why many people in the know, strongly believe that within just a few short years (substantially less than the 15+ years it's taken social media to mature) Web 3.0 technology will drive many of the digital interactions and transactions that will take place. The pace of change will therefore be incredibly fast and only a lack of awareness or education relating to the benefits of Web 3.0 will hold back the inevitable.

The purpose of this White Paper is to help overcome some of the obstacles relating to Web 3.0 education using laymans terms and real life examples to help illustrate the opportunities that exist now. As mentioned, first-mover advantage is a very real concept and those who embrace this will stand to benefit faster than others.

[4] https://www.statista.com/statistics/377808/distribution-of-facebook-users-by-device/

1.0 Why Web 3.0 / Web3?

1.1 The challenge with Web 2.0

It makes sense to address the need for a new iteration of the web. After all, for billions of people around the world, the internet today isn't broken nor needs any form of repair. And this may well be the case. But let's present the facts.

The Open Internet of the 1990s changed in the mid-2000s.

During the first era of the internet, the web was built on open protocols. These open protocols (TCP, IP, SMTP and HTTP) allowed almost anyone to use these 'rules' or governance guidelines to help build the foundations and ecosystem of the internet. Website developers could easily create and launch new websites or internet systems upon this framework.

In the Web 2.0 era, companies have used these open protocols but with the addition of a second layer of proprietary, closed protocols. The closed protocols have allowed large profit-focused companies such as Google, Facebook, Amazon and Apple to build software and services that outpaced the development and capabilities of the original open protocols. A good example of this from Andreessen Horowitz from their a16z "Web3 Landscape" guide is the use of email. Email was built on SMTP (Simple Mail Transfer Protocol). While no individual company owns SMTP, companies such as Google, built software such as Gmail. Individuals don't pay to use Gmail but Gmail supports Google's core business, which is collecting data to sell targeted advertising. In the Web 2.0 world there's a saying that "If you're not paying for it, you're not the customer, you're actually the product." [5]

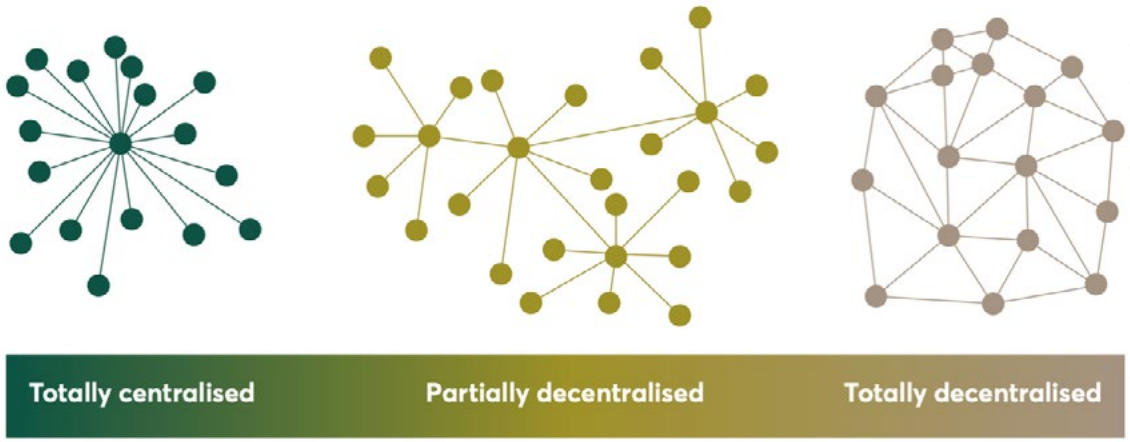
Because of this and other countless examples of a similar nature, there is a centralisation of power that needs to be challenged. Web3 and the communities driving this are fully aware of these challenges and the need to provide an alternative to the status quo. The goal of Web3 is to put power in the hands of communities instead of corporations.

[5] https://a16z.com/wp-content/uploads/2021/10/The-web3-Readlng-List.pdf

1.2 The need for Decentralisation

In the context of Web3, the concept of decentralisation refers to the process of decentralising power away from an authority, organisation or location so that no individual or individual entity makes decisions on behalf of all parties.[6]

To help illustrate the definition, the diagram below highlights the difference between a centralised, partially decentralised[7], and decentralised organisational structure.



Source

the original internet, as conceived by its founders, was based on the premise that its organisation was decentralised and chaotic where users connected with each other without and no single organisation had ownership or control, but the success of it can be narrowed down to these 5 developments:

- TCP/IP & FTP
- World Wide Web and HTML
- Web Browsers
- Search Engines
- Internet Service Providers

[6] https://www.nesta.org.uk/report/introducing-decentralised-futures/why-decentralisation-matters/#content

[7] https://hackernoon.com/the-evolution-of-the-internet-from-decentralized-to-centralized-3e2fa65898f5

It's difficult to talk about the origins of the world wide web without referencing its inventor, Sir Tim Berners-Lee but even during the early days of the internet, Berners-Lee referenced the need for a decentralised environment for its users. In fact, he ensured that the underlying code for the internet be available, royalty-free forever. During this time, Berners-Lee and the community of early adopters listed fairly revolutionary guidelines for this new sector:[8]

Decentralisation: No permission is needed from a central authority to post anything on the web, there is no central controlling node, and so no single point of failure … and no "kill switch"! This also implies freedom from indiscriminate censorship and surveillance.

Non-discrimination: If I pay to connect to the internet with a certain quality of service, and you pay to connect with that or a greater quality of service, then we can both communicate at the same level. This principle of equity is also known as Net Neutrality.

Bottom-up design: Instead of code being written and controlled by a small group of experts, it was developed in full view of everyone, encouraging maximum participation and experimentation.

Universality: For anyone to be able to publish anything on the web, all the computers involved have to speak the same languages to each other, no matter what different hardware people are using; where they live; or what cultural and political beliefs they have. In this way, the web breaks down silos while still allowing diversity to flourish.

Consensus: For universal standards to work, everyone had to agree to use them. Tim and others achieved this consensus by giving everyone a say in creating the standards, through a transparent, participatory process at W3C (World Wide Web Consortium). However since then, power has certainly become more centralised with information now flowing through a small handful of individual corporations who now determine what gets published and therefore what gets seen and by whom. The trade off for this is that we now have a much more user friendly version of the web that we all enjoy but this trade off has certainly come at a steep price in terms of data ownership, privacy and of course, overall decentralisation of the web. Certainly, one of the key arguments here is based around whether the free use of platforms such as Facebook, Google, TikTok and others is a fair trade off in terms of compensating users for the value of data and content created on these platforms.

Because of this, there is a large and growing movement focused purely on the decentralisation of the web[9] (including Sir Tim Berners-Lee), where users own and control their own data using principles such as Peer to Peer (P2P), a Decentalised Web (using a different address system to the current web), Distributed Computing and Distributed Applications.

[8] https://webfoundation.org/about/vision/history-of-the-web/

[9] https://www.nesta.org.uk/report/introducing-decentralised-futures/re-decentralisation-internet/

2.0 The Key Ingredients of Web3

As mentioned in section 1 above, Web3 technology does not just already exist but is at a mature enough stage to impact our everyday lives in its current form. It's therefore essential to understand the technology that drives Web3 and the implementation of these technologies that impact our daily lives.

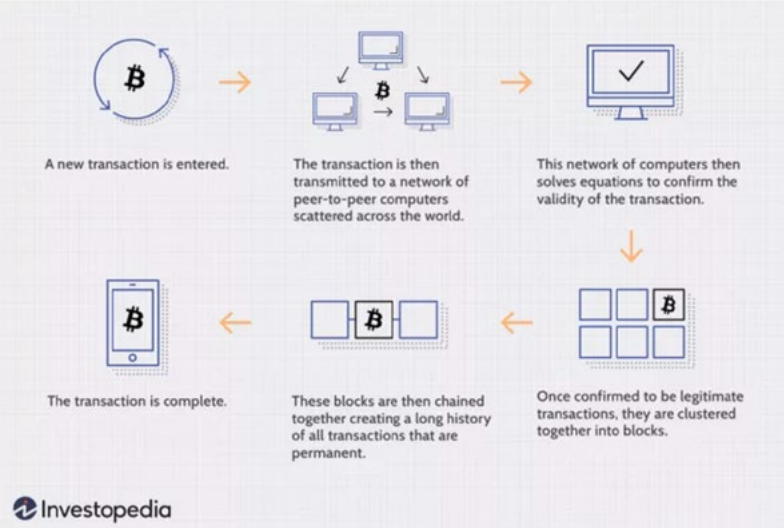
2.1 The foundation - The Blockchain Ledger

As of now, Blockchains are best known for their role within cryptocurrency, creating and recording a digital ledger of each transaction made. A blockchain guarantees the legitimacy and security of a record of data and in doing so, generates trust without the need for a 3rd party. Traditionally, this role may have been provided by a government, financial institution or legal services provider.

The blockchain, in essence, is a database of records, but with one clear distinction. Whereas a database typically stores data in tables, a blockchain groups data into blocks with each group holding a specific set of data. Blocks have specific storage capacity, and once a block is filled, a new block is created that links the new block with the previous block - therefore creating a chain of blocks, or blockchain. The nature of each block, together with a time stamp of activity recorded for each activity relating to the block, provides a linear sequence of events that can form a clear timeline that is set in stone - a ledger of activities or transactions.

As mentioned above, the most common use of blockchain technology is related to cryptocurrency transactions but it's absolutely vital to note that different types of data can be recorded on a blockchain ledger. This includes legal contracts and product inventory amongst other items. Blockchain technology is decentralised and therefore no activity that has been recorded on a ledge can be reversed or erased.

The image below[10] summarises the process of a Bitcoin transaction recorded on a Blockchain:



Source

[10] https://www.investopedia.com/terms/b/blockchain.asp

2.1.1 Blockchain Decentralisation

The decentralised nature of a Blockchain means that there is no single point of failure that would compromise the storage, security or longevity of the data that is stored on it. For example, if a company held its entire database of clients on a single computer or server and the server malfunctioned, this single point of failure may have huge consequences for the business. The use of P2P networks within a Blockchain record allows the creation of multiple nodes to be created to log transactions.

The P2P infrastructure and connectivity ensures that nobody can ever take down the Blockchain. This also eliminates the need for 3rd parties that could potentially amend or modify crucial data ensuring maximum security.

2.1.2 Blockchain and Transparency

The decentralised nature of blockchains means that the data stored on a ledger can be transparently viewed via a personal node or via Blockchain Explorers that can show live transactions being recorded to the ledger. Each transaction is encrypted with the user having the option of decrypting information in the event they wanted their identity to be revealed.

This level of transparency also helps to support the security and integrity of each activity on the ledger and means that any unscrupulous attempts of fraudulently amending a record can be identified within seconds. For example, if an individual block was manipulated by a hacker, all related blocks (or synchronised versions of the blocks) within the chain would be misaligned in terms of the data stored and would therefore stand out as an anomaly and therefore cast the hacker's version as illegitimate. Legitimacy can only be achieved if 51% of the blocks were to show the same data - something that is highly improbable given that each activity has a timestamp and would therefore need to be orchestrated at precisely the same time.

2.1.3 Who owns the Blockchain

The technology that underpins the Blockchain cannot be owned by anybody with the technology being a protocol. That said, there are over 1,000 blockchains in existence today with this number growing on a daily basis[11]. There are also 4 main types of blockchain networks, all serving a specific purpose. These are summarised in the table below:

Type of Blockchain Network	Type of Blockchain Network Main Utility	Benefits / Usage
Public	Cryptocurrency	Transparency, trust and independence
Private	Enterprise / Smaller Networks for Asset Ownership & Supply Chain	Access control (trade off is trust) however still decentralised
Hybrid	Verification based access. Eg Medical Records / Real Estate	Access control - confidential data by access only
Consortium	Multiple members can collaborate across a decentralised network with preset validation nodes. Supply chain	Restricted access to a specific group

[11] https://earthweb.com/how-many-blockchains-are-there/

2.1.4 Blockchain Platforms

By understanding the different types and utility of blockchain networks in use today, it's important to understand the platforms that have been created to serve a specific purpose. The below is a short list of platforms that exist today and their main utility:

Blockchain Platform	Blockchain Network	Utility
Ethereum	Public	First blockchain for creating smart contracts and decentralised applications
IBM	Private	For risk-sensitive enterprises that want to link into cloud and legacy technologies. IBM Food Trust has impacted Supply Chain transaction recording significantly in certain countries.
Tezos	Public	More modern smart contracts blockchain that can be used for Proof-of-Stake ledger recording
Stellar	Consortium	Stellar focuses on multi currency connecting banks, people and payment systems to move money quickly and at very little cost
EOSIO	Public	Open sourced platform that allows businesses of all sizes to build blockchain and smart contract ledgers.

2.2 Cryptocurrency in Web3

2.2.1 Bitcoin

There's no doubt that the success of Bitcoin has opened the eyes of a mass audience who have either watched in awe as the cryptocurrency has soared in value since its inception or enjoyed the financial benefits of its success. But the main positivity of Bitcoin revolves around its validity as a currency and the technology that underpins it. Yet there are those who still consider Bitcoin and other similar currencies, nothing more than a fad.

Make no mistake, Bitcoin and its success is primed to continue. Its market capitalization today is over $1 Trillion with over 40 million Bitcoin users in existence at the time of writing. Bitcoin however, isn't new. Launched by Satoshi Nakamoto in 2009 on the back of the great financial crisis in 2008, where the world's reliance on financial institutions first came into doubt. The failure of major banks and financial institutions - many of whom needed large scale government support to avoid default and bankruptcy, highlighted the need for alternative financial systems. Bitcoin uses peer to peer (P2P) payment systems that avoid the need for traditional 3rd party confirmations and therefore reducing the requirement for banks to be involved in this process. Instead, each transaction is recorded on the blockchain with a reliance on the 'Proof of Work' standard, employing mathematical algorithms to validate the authenticity of transactions, which each record securely stored on the blockchain ledger.

Back in 2010, when the first Bitcoins were traded, one Bitcoin was valued at just $0.0008. In 2010, as the famous story goes, a hungry programmer purchased 2 Papa John's pizzas for 10,000 Bitcoin. Today, at the time of writing, the value of a single Bitcoin is approximately $47,500. Those two pizzas today would be worth the equivalent of $475 million! It's clear that the increased value of Bitcoin has been nothing short of astronomical and despite frequently fluctuating valuations, Bitcoin has continued to increase in popularity as a store of money with the annual adoption rate of Bitcoin averaging out at 113% per year[12].

Much of Bitcoin's success has come down to its scarcity. In total, there will only ever be a maximum of 21 million coins issued and with approximately 19 million already mined and in circulation, the increase in demand isn't supported by supply and as greater acceptance of Bitcoin as legal tender occurs, the demand is likely to support further price increases. El Salvador was the first country to formally accept Bitcoin as legal tender in the country and this is a route that will likely be followed by other countries over time.

That said, Bitcoin's valuation is still some $20,000 off its peak of $68,000, which it achieved on 10th November 2021 and while speculators predict a price of $100,000 per Bitcoin in 2022, a sense of caution must be taken into consideration before investing.

[12] https://time.com/nextadvisor/investing/cryptocurrency/bitcoin-price-predictions/#:~:text=Bitcoin%20adoption%20has%20been%20increasing,slower%20rate%20of%2063%25.)

2.2.2 Ethereum

With the growth in popularity and support for Bitcoin, other technologies were created using the Blockchain as a ledger for each activity or transaction. The most famous of these is Ethereum, founded by Vitalik Buterin, which is an open-source platform that uses the Blockchain to record smart contract transactions and cryptocurrency without the need for 3rd parties. Ethereum also has its own cryptocurrency, Ether (ETH), which is growing in popularity due to its use within multiple applications, which is one of the key differences (and advantages) over Bitcoin. Indeed, Ethereum is described as the 'world's most programmable blockchain'[13]
In Q2 2022, Ethereum is looking to transition from the Proof of Work standard to a Proof of Stake standard, which will have multiple, positive implications for the crypto community. For one, Proof of Stake will make Ethereum up to 99.95% more energy efficient and significantly reduce ETH emission. Another significant advantage of this complicated upgrade (also known as 'the Merge'), is the increased security and scalability of Ethereum, according to Trent Van Epps from the Ethereum Foundation[14].

Ethereum and NFTs

One of the key applications of Ethereum today is linked to its role in the purchasing of Non Fungible Tokens (NFTs). Ethereum enables the whole NFT ecosystem to function because of the following reasons:

- Ethereum is decentralised and secure.
- Transaction history is publicly verifiable making it easy to prove ownership of any digital asset.
- The trading of NFTs can happen on a P2P basis removing the need for (commission claiming) third parties.
- Ethereum's backend (or technology base) is universally the same. This means that all Ethereum products can all understand each other, making NFTs portable across different products.

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13 https://ethereum.org/en/what-is-ethereum/
14 https://cryptobriefing.com/ethereum-merge-proof-of-stake-with-trent-van-epps/#:~:text=With%20Proof%2Dof%2DStake%2C,otherwise%20join%20 a%20staking%20pool).

3.0 Non-Fungible Tokens (NFTs)

Although NFTs have been around since 2014, it was until 2021 that these became popular. Dismissed by many as the latest blockchain fad, this latest 'bubble' has witnessed over $25 billion of NFT transactions were recorded in 2021[15]. As we've learned from the likes of Bitcoin and Ethereum, some fads are worth investigating before being totally dismissed. But before we dive deeper into the world of NFTs, it perhaps makes sense to establish what these are and why they exist.

[15] https://www.cnet.com/news/bored-ape-yacht-clubs-new-metaverse-shows-nfts-are-evolving/

3.1 What is an NFT?

Let's tackle the 'non-fungible' part first. Non-fungible, basically means 'unique'. Something that cannot be replaced identically by something else. For example, a $100 bill can easily be traded for say, another $100 bill (which makes it fungible). The Mona Lisa however would be classed as non-fungible and if you traded the original Mona Lisa, you couldn't do so for another original Mona Lisa.

The tokenisation aspect of NFTs in essence makes these assets easier to buy, sell or trade using a stamp of authenticity linked to ownership. Most NFTs are on the Ethereum blockchain allowing each transaction to be publicly verified to enable efficient proof of ownership.

3.2 What is the point of NFTs?

There are many different schools of thought when tackling this question. Initially, NFTs were seen as the solution to the problems of Web 2.0 where creators, who were often at the mercy of large tech corporations who monetised a combination of unique content, community engagement and data for profitability, simply weren't being compensated fairly. In this scenario, Web3 and specifically NFTs, remove 3rd parties from the equation allowing the community to directly access, purchase and own digital content directly from creators. But this doesn't just impact digital-first creators. Recently, Dolly Parton launched limited editions of her new album Run, Rose, Run in the form of an NFT[16]. In this scenario, the middle man could be seen as the record label, but either way there's a sense of optimism for creators who finally have the opportunity to be rewarded for their creativity.

While artists and creators were amongst the first to understand the impact of NFTs within their industry, there is a deeper sense of possibility that is coming into play and although not mainstream, it's important that we consider these newer NFT applications in order to understand the opportunities for businesses.

[16] https://www.harpersbazaar.com/celebrity/latest/a39310963/dolly-parton-nft-dollyverse/#:~:text=The%20two%20are%20working%20with,by%20Southwest%20Festival%20in%20Texas.

3.2.1 Real World Assets as NFTs

The ways that NFTs can be constructed allows for different use cases and therefore, they present an ideal way to represent real world assets such as art or even real estate. In fact, there have already been real estate transactions that were completed using the sale of NFTs [17]. Despite being in the early days of this technology, these types of transactions have already tackled traditional processes, threatening the status quo by ultimately removing middlemen from the equation and therefore saving both time and money from the process. We're aware of the changing needs of GenZ as an audience and long, drawn out purchasing cycles and bureaucracy is certainly not desirable.[18]

3.2.2. NFTs as a Community Enabler

It's fair to say the the early NFTs were certainly focused on the ownership aspects of digital assets but combined with other technology, NFTs are quickly becoming a validation token (or ticket) for access into communities of like-minded individuals who all have one thing in common - ownership of a specific type or part of a collection of NFTs. Using platforms such as Discord, NFT holders can access a collection's dedicated channel and communicate with other 'members' after validating their NFT ownership.

This progression is happening at an incredibly fast pace with hundreds, if not thousands of new NFT collections being launched each month enabling new communities to be formed within days. Connectivity and interoperability between platforms is key to this with digital wallets being used to validate ownership using 3rd party applications that have been built to work with platforms such as Discord. Most communities have an open area where those who want to be a part of the community can participate and engage with other communities; however, those with validated NFT ownership can access member-only channels where privileged content, insights and opinions can be accessed.

It's important to note that NFT ownership doesn't just unlock new Discord channels for validated owners. There's now an increasing demand from members for utility, whereby additional benefits - including but not limited to financial benefits such as discounts and savings can be achieved. The term 'game-changer' is often bandied around without justification, but for those who understand the benefits of being a part of an exclusive community or network through ownership rather than social status, the provision of utility as a reward for NFT ownership certainly can be regarded as a game-change for many.

[17] https://www.forbes.com/sites/nataliakarayaneva/2021/11/24/real-estate-nfts-how-it-began/?sh=7f3e886a3b12

[18] https://ologie.com/full-circle/2021/11/taylor-swift-tiktok-and-trend-watching/

3.3 The most-popular NFT collections

Ask anyone in the know, which are the most famous NFT collections and chances are they'll mention the Bored Ape Yacht Club and CryptoPunks. We've discussed utility and the benefits of ownership above, and both are very different in this regard. We'll look at each of these separately in order to get a deeper understanding of their popularity and why they continue to rise both in terms of prestige and value.

3.3.1 Bored Ape Yacht Club (BAYC)

What is it?

Owned by Yuga Labs, BAYC is a collection of 10,000 NFT collectables (each with different traits and outfits) that live on the Ethereum blockchain. Each bored ape NFT doubles as the owner's membership to an exclusive 'Yacht Club' providing multiple benefits to members.

What's the current value?

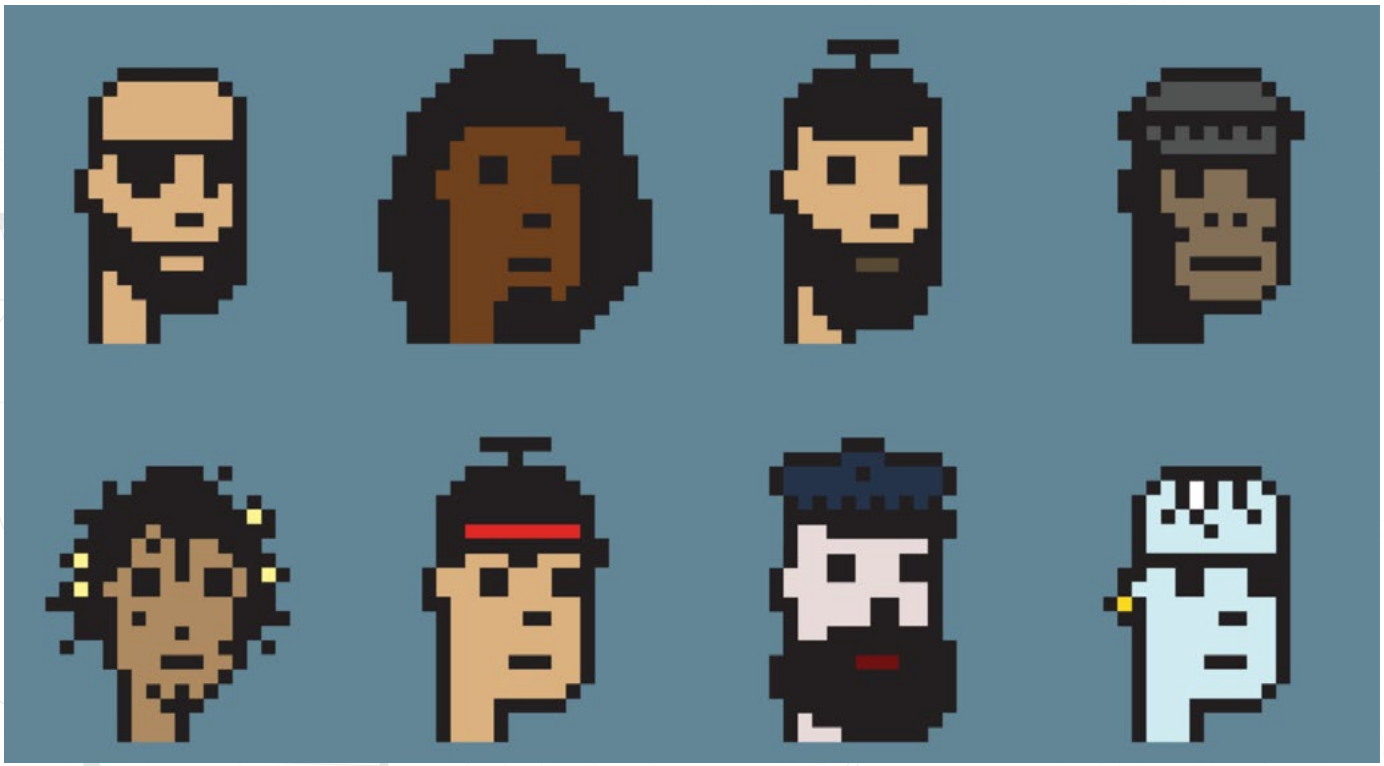
At current prices (April 2022), the floor price for a single BAYC NFT is $368,725. They launched at ETH 0.08 back in April 2021 (equivalent to $190).

What are the benefits of ownership?

The benefits for members of BAYC are as follows:

- Membership to an exclusive club with celebrity members such as Jimmy Fallon, Serena Williams, Justin Bieber, Paris Hilton and Eminem to name a few.
- Access to members-only collectibles such as the Bore Ape Kennel Club that allowed members to 'adopt' a dog NFT with traits that mirrored their original BAYC NFT. Owners could then mutate their original BAYC NFT with their dog NFTs to create Mutant Ape NFTs and then have the ability to sell these on the open market. These NFTs alone are currently selling at ETH 24 (approx $84,000) each.
- Access to the community and community meetups exclusively for NFT owners. These have included an actual yacht party and concert featuring special guests such as Aziz Ansari, Chris Rock and a performance by the Strokes.
- A modern day status symbol. With the ability to use your exclusive NFT as your avatar on platforms such as Twitter and Discord (an upgraded feature on Twitter), many owners have likened this to wearing an expensive Rolex or Patek Philippe watch but for the digital world.
- Free 'Airdrops' to owners of the newly launched ApeCoin were distributed in March 2022. Each BAYC NFT owner received approximately 10,000 ApeCoins which were free to claim. Within hours of launch the ApeCoin price had risen and at the time of writing sits at $12.70 per ApeCoin meaning that those who didn't sell the airdropped coins would have additional assets worth $127,000.

3.3.2 CryptoPunks



What is it?

Launched by Larva Labs (but recently acquired by Yuga Labs), CryptoPunks was one of the first NFT collections to become mainstream. Initially launched as a free NFT, the allocation of 10,000 unique was too large to store on the blockchain and instead a hash of the composite image for each CryptoPunk NFT was taken and embedded into the smart contract. However, since then and with the assistance from the community, the record are now securely on the blockchain.

What's the current value?

The current price of a CryptoPunk NFT (April 2022) is ETH 70.69 ($237,000) although its important to note that each CryptoPunk can vary in value in the open market.

What are the benefits of ownership?

- Much like BAYC, there are a number of celebrity owners of CryptoPunks including rapper Jay-Z, Shawn Carter, Steve Aoki and Gary Vaynerchuk who owns 59 CryptoPunks. This provides a status symbol for many. CryptoPunks was the original NFT and therefore owners of this are highly regarded within the crypto community.
- Unlike BAYC, community building and engagement wasn't one of the core objectives of the CryptoPunks NFT but those who own the NFT, claim that the owners have created their own community. One verified owner, Mike Dudas, rates the CryptoPunks NFT highly as "it's the OG & it's pure. The 'lack' of formal / project-led utility causes the holders to band together and fill in in cool ways via their own chats & get-togethers."

3.4 How do you purchase NFTs?

The purpose of the White Paper isn't to provide a 'how-to' guide to cryptocurrency and Web3 however, most NFTs are available on the open market and platforms such as OpenSea will allow you to trade cryptocurrency for NFTs. Remember, you'll need to load your digital wallet with a currency such as ETH in order to make a purchase and securely store your NFT.

Not all NFTs cost hundreds of thousands of dollars, so if you are interested in investing in NFTs keep you should consider the following:

- **Do your research.** Platforms such as Twitter and Discord house communities for many NFT collections. Get a gauge not just on follower or community numbers but actual engagement. If there is a strong community feel, you may be onto a winner. If the follower numbers are high but there's very little engagement, it's likely that the followers were 'bought' and that the collection or any promises related to the utility will materialise.
- **What's the mission?** Once you've purchased or minted an NFT, you'll more than likely have access to the community of fellow NFT owners. It's therefore important that you select a NFT collection and community that serves a purpose that is aligned to your own mindset. That said, if your own personal goal is to generate a quick profit on your NFT, the need for community may not be relevant.
- **Consider the floor price.** One of the main advantages of NFTs being recorded on the blockchain is transparency. Platforms such as OpenSea will show you real-time transactions for each collection and can also show you the full history of each particular NFT. For example, you'll have access to information such as the number of times the NFT has been sold, bid on or even listed for sale. This will give you an idea as to how volatile the NFTs price could be. Also, if you see a large number of NFTs being flipped (bought and sold frequently), this may suggest that there will be price fluctuations that could go in either direction. Remember, scarcity is an important factor so coupled with demand together with the strength of the community can help you determine a good investment over a bad one.

4.0 Smart Contracts

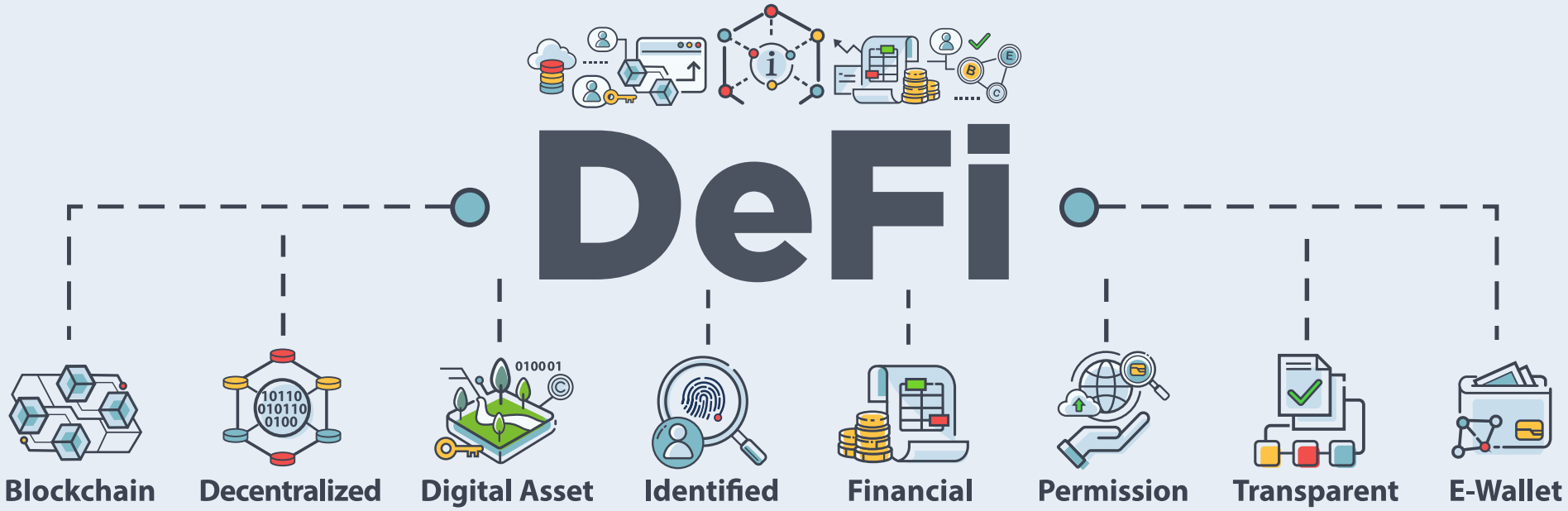
Smart contracts are digital contracts stored on a blockchain that are automatically executed when predetermined terms and conditions are met. Smart contracts are used to execute a trade or agreement between all parties so that everyone involved can be safe in the knowledge that a record of the agreement is stored on the blockchain.

Typically generated using automated trigger-based workflows, Smart contracts have the following benefits when used: [19]

- **Speed, efficiency and accuracy:** No paperwork nor manual error checking compared to traditional contracts
- **Trust and transparency:** No third-parties and instant confirmation for all parties of a completed activity removes any doubt that the agreement has been tampered with by others.
- **Security:** Transactions are recorded on the blockchain and are therefore encrypted. Each record is related to previous and future activities, which means that hackers would need to amend the entire chain to change a record.
- **Cost savings:** Smart contracts remove the need for third party professionals such as lawyers to create and execute an agreement saving both time and money in the process.

To summarise, smart contracts are used to execute all transactions on the blockchain whether this be for the purchasing of cryptocurrency through to NFT transactions as well as wider commercial use including vendor / supplier contracts. Due to the benefits of smart contracts, it's inevitable that smart contracts will become more and more popularised in the future with wider applications that will positively impact our personal and professional lives.

[19] https://www.ibm.com/topics/smart-contracts



5.0 DeFi

The financial services industry is one of the industries that has been most disrupted by cryptocurrencies and the blockchain. Decentralised Finance - or DeFi as it's commonly known is the umbrella term used to define finance related applications that are developed on the blockchain. Smart contracts are utilised to confirm activity and transactions.

As with the mindset that underpinned Bitcoin, DeFi has been developed to eliminate the need for third-party or regulatory involvement, giving greater control to people rather than authorities.

In order to get a better understanding of how DeFi is impacting society, the following use cases highlight some of its current applications:[20]

- **DeFi Lending and Borrowing**

  Much like traditional loans, decentralised lending allows cryptocurrency holders to earn interest by lending money to others in order to generate a yield. The platform Compound was created by Robert Leshner is one of many that facilitates this process.

- **Decentralised Exchanges**

  Decentralised Exchanges (DEx) is another example where the traditional middleman's role has been eliminated. DEx's allow token owners to swap or exchange their tokens for other assets without the need for a central exchange or other authority. This reduces the cost of each transaction and reduces the time required for a trade. Founded by Hayden Adams, Uniswap is the largest automated token exchange[21].

- **Prediction Markets and Asset Management**

  Platforms such as Augur and Ampleforth allow token owners to leverage DeFi services related to Prediction Markets (betting) and the Asset Management of illiquid assets.

[20] https://hedera.com/learning/what-is-decentralized-finance

[21] https://hedera.com/learning/what-is-decentralized-finance

6.0 Decentralised Autonomous Organisations (DAOs)

A major part of Web3 that will increasingly become more popular and prevalent for entrepreneurs and like-minded communities are Decentralised Autonomous Organisations (DAOs). As the name suggests, DAOs are decentralised business entities where its management, decision making and ownership is spread between the members / owners of a DAO rather than centralised to a small group of decision makers. They have built-in treasuries that no one has the authority to access without the approval of the group. Decisions are governed by proposals and voting to ensure everyone in the organisation has a voice.

The decentralised aspect of DAOs mean that there is no CEO of a DAO nor a CFO that can potentially manipulate financial records. With DAOs, there is total transparency and the rules around spending are coded directly into the DAO[22].

DAOs fundamentally shift how businesses are structured and governed compared to how most businesses operate today. Smart contracts are the backbone of a DAO and the rules of engagement are defined within this. Importantly, smart contracts can be verified easily and cannot be manipulated. This provides a level of trust and transparency in a DAO allowing like-minded or interested parties to easily invest in an entity and have a say in all decisions related to it.

The table below compares how DAOs differ from traditional companies:

DAO	Traditional Organisation
A flat and unstructured organisational structure	Typically hierarchical structure
Voting is required for members to make changes to the entity or to make spending decisions	Changes can be made by a sole party or smaller vote based on controlling interests
All votes are tallied with the outcomes automatically implemented with the need for a third-party	Votes counted manually and are open to manipulation from third-parties
All activity and transactions is transparent and fully available to the public	Transactions and activity is typically private and not available publicly
Depending on the structure of the DAO, membership can remain fairly liquid and tradeable in public Web3 markets	Often difficult to exit private entities.

[22] https://ethereum.org/en/dao/

6.1 How can DAOs be used

DAOs can replicate many of the types of traditional organisations that exist today:

- **Charities / Causes:** A DAO can be created to help raise funds for a single or group of charities with spending decisions voted upon by DAO members.
- **Networks:** Groups of people can join forces, raising capital for investment in specific activities. For example, a group of freelancers can come together and use their collective buying power (held in the DAO) to vote on aspects such as office space, software tools and get-togethers.
- **Private Ventures**: DAOs have been formed to create purpose-specific ventures. For example, PleasrDAO was created by a group of like-minded NFT collectors who raised funds to make collective investment decisions relating to NFTs and other assets. Another example, is LinksDAO that was created by a community of golf enthusiasts with the purpose of building a new golf course and modernising the golf club membership experience.

6.2 How does DAO Membership / Ownership work?

There are two main types of DAO membership in use today:

- **Token-based Membership**

  Members can participate in a DAO by trading tokens on a decentralised exchange. An example of this could be through the trading of NFTs where owners would gain access to the DAO through ownership. Token-based membership is permissionless with any NFT owner having equal rights to other NFT owners.
- **Share-based Membership**

  More permission-based than token-based membership, those wanting to become a DAO member through a share-based membership would typically need to submit a proposal offering work-based services or contributions or tokens.

7.0 How DAOs are impacting the world

It's often difficult to understand the impact of something without any real world connection or case studies and Web3 certainly falls in that category with the complexity involved. But there are some very real examples of how Web3 is impacting lives for the better. Below are some examples of this.

- **UkraineDAO**

  UkraineDAO was set up with the sole purpose of raising much-needed funds for Ukraine to support their country's defence against Russia. A number of high-profile activists and esteemed members of Web3 community include Pussy Riot, Trippy Labs and PleasrDAO members joined forces to create the DAO in February 2022. The DAO launched and traded a number of Ukraine flag-based NFTs with all proceeds directly going to the ongoing effort.

  The founders launched a DAO in favour of traditional fund-raising efforts for a number of reasons. The first, was to eliminate the need for third-party involvement, which are susceptible to interception by authorities, private entities and governments. Another reason was to demonstrate how DAOs are a model for individuals around the world to come together and positively support humanitarian efforts[23].

- **Big Green DAO**

  Although cited as a philanthropic 'experiment', the Big Green DAO is already making an impact that's fully aligned with its mission, which is to support schools, families and communities to grow their own food. In their own words "Growing food improves nutrition security and mental health, increases time spent outdoors, and cultivates a deeper appreciation for our collective impact on the climate[24]."

  What sets the Big Green DAO apart from other similar DAOs is in its governance. Starting with a $1million fund, designated for grants, the DAO selected 5 entities to support in it's first phase with each beneficiary receiving a grant of $50,000. Each beneficiary, then becomes a DAO member and it's their responsibility to select the next set of beneficiaries for a grant. Once selected, these new beneficiaries all become DAO members, with the original beneficiaries retaining their membership. If for example, 15 new beneficiaries are selected, the next round of selection will now be voted upon by a total of 20 members. This process is repeated and with each new phase of grants, the membership widens.

  This form of DAO takes advantage of decentralisation and by increasing the number of votes required to formalise an action, lessens any potential for vote manipulation and will hopefully, mean that better causes or those in real need for these grants are selected.

[23] https://www.ukrainedao.love/ukraine-dao

[24] https://dao.biggreen.org/

- **LinksDAO**

  LinksDAO is the perfect example of a global community coming together for a specific purpose and in this case, it's to build or buy a top 100 golf course in the USA and create the best golf club membership experience possible for its members. LinksDAO was ideated in December 2021 and within just a few weeks, launched a series of membership NFTs with two main categories - Leisure and Global. A total of just over 9,000 NFTs were minted and sold out within 48 hours, with LinksDAO generating funds of over $10million.

  This specific DAO is focused on utility and one of its goals is to provide as much value to NFT holders as possible. To date, multiple discounts have been negotiated with industry suppliers and the goal to purchase a golf course and launch it by Q2 2023 remains on target. This is certainly one to watch

The use cases above demonstrate the opportunities that exist for different types of organisations. At the heart of each DAO is decentralisation and community and these core elements will impact the success of these organisations over time.

8.0 The Metaverse

You may be wondering why we didn't start this White Paper with a chapter about the Metaverse. After all, it's this aspect of Web3 that has captured the imagination of the mass public over the last few months. But it's important to understand the difference between the two and although there are areas of crossover, both of these are very different. As we've explained so far, Web3 very much refers to the decentralised internet. The Metaverse on the other hand is focused on virtual worlds. Both provide immediate opportunities but the reality is that their applications in the real world are very different[25].

The Metaverse allows those within it to engage with others using apps and services. Individuals typically create virtual versions of themselves, known as 'avatars' and use this virtual self to navigate around a metaverse. While this virtual universe is familiar to gamers (the likes of Roblox and Fortnite are based around their versions of a metaverse), there are multiple businesses currently exploring alternative metaverses for a wide range of applications.

The company Meta (formerly known as Facebook) is developing their own metaverse, using its Oculus Quest 2 headsets that enable immersive experiences for those who wear the device. Other notable metaverses include The Sandbox and Decentraland and herein lies the potential challenges when it comes to the metaverse in its current state. One of the key aspects of Web3 is the drive for decentralisation however, with multiple metaverses being created and run by different organisations, we're currently in a state of flux where the lack of interoperability means that current metaverse users are having to choose between different platforms rather than navigate their way through multiple metaverses. Meta, for example, has earmarked investment of $10billion into the Metaverse and has launched a number of centralised applications based on their Horizon product suite that can and potentially will only work using Meta controlled devices.

There are also a number of other metaverses that have either been created or are in the process of being created that serve specific purposes, which further adds the complexity of interoperability. For example, the creators of the FLUF collection of NFTs have recently launched additional NFTs that have been earmarked for a role in their version of the metaverse. Headoffice. space is another metaverse, but one that focuses on corporates as a target audience. With each additional metaverse, the risk of dilution also increases and therefore, the need for user growth also increases. While this may not be an issue (the current number of metaverse users is estimated to be in the millions rather than billions), the lack of a single, unified metaverse may present challenges to growth.

History has taught us that only a few metaverses may survive (think of how many core social media platforms remain today) but in a truly decentralised environment that includes interoperability and the ability to seamlessly navigate through different metaverses, the chances of more metaverses surviving increases exponentially.

While we've addressed certain challenges with the metaverse today, there are undoubtedly opportunities that should be explored and we'll highlight a few of these below:

[25] https://www.forbes.com/sites/bernardmarr/2022/02/22/the-important-difference-between-web3-and-the-metaverse/?sh=7bd1a8765af3

8.1 Current metaverse opportunities

- **Brand Visibility and Activations**

  A number of brands have already embraced aspects of the metaverse, launching activations designed to engage audiences that are spending time in the virtual world[26]. Brands such as Disney, Adidas, Gucci, Samsung, Coca-cola, Sotheby's and Hyundai have all experiment thus far with a range of activations including NFT drops, product launches and in the case of Sotheby's art sales direct from the company's presence in the Decentraland platform.

- **Land Purchasing and Investment**

  Easily relatable to real-life, the purchasing of 'land' on both The Sandbox and Decentraland metaverses has been a lucrative business for many early adopters. With primary land sales selling out fast, brands and investors have turned to the secondary market to make purchases. Prices in the secondary market have increased as much as 13x from initial launch prices with both celebrity purchasers such as Snoop Dogg and established corporations such as PwC, JP Morgan, HSBC and Samsung already investing heavily in virtual land.[27] Once land is purchased, owners have the option of 'building' on the land - which may be a representation of themselves or their businesses in the metaverse or to perhaps rent out the land to others who require it for a specific project or activation. They can of course also do nothing in the anticipation of increased real-estate prices and make a profit on a future sale.

- **Revenue Opportunities**

  Some brands have created virtual versions of their businesses with the added option of selling virtual memorabilia to its audience. Club Amnesia, a famous nightlife brand originating from Ibiza, launched a 'nightclub' in Decentraland complete with rooms for different music genres as well as a store that sells different types of virtual clothing, headwear and other types of memorabilia (NFTs) that can be stored on digital wallets by those who make a purchase.

- **Virtual Showrooms & Product Launches**

  The COVID-19 pandemic and forced lockdowns around the globe showed that people are prepared to make purchasing decisions using digital tools and communication channels and there's a possibility that next generation tools to support digital sales can be developed in the metaverse. Using platforms such as The Sandbox, Decentraland and other more niche metaverse platforms, companies can either rent or purchase land and use the land to create immersive and interactive experiences for potential customers. Virtual showrooms can be used for either qualified lead generation or direct purchase by directing visitors to an online store.

- **Internal Communications and training**

  With remote working on the rise around the world, companies face challenges relating to employee onboarding, training, staff collaboration and general employee bonding. The metaverse provides the potential of filling this hole for companies and to date, some have used the metaverse to enable large scale employee onboarding and to provide training to employees by creating customised corporate environments, where employees can interact with others while engaging with Web2 collaboration tools such as videos, presentations and other documents.

[26] https://blog.digitalnexa.com/brands-in-the-metaverse-the-best-case-studies-so-far

[27] https://www.forbes.com/sites/bernardmarr/2022/03/23/how-to-buy-land--real-estate-in-the-metaverse/?sh=21a3d7aa546e

9.0 Web3 Legal Frameworks

There's an underlying feeling that with Web3, the legal frameworks that will govern this technology will be deemed as 'supernational' rather than what we'd typically class as international by definition. The reason is that international law still requires governance from a centralised level - whether these are independent authorities or governments. With the blockchain together with smart contracts and the level of transparency provided by this newer framework, governance is on a peer to peer level removing the requirement for government or authoritarian control. This provides an interesting challenge for many - especially regulators - but the pace of change is so fast that writing and passing democratic law will be an increasing challenge.

That said, there is a requirement for legal frameworks and corporation law that covers the existence of business frameworks such as DAOs and progress has been made in this regard. For example, the state of Wyoming became the first US state to recognise DAOs as legal entities and passed a law on 1st July 2021 that gave DAOs the same rights as limited liability companies.[28]

Further legislation will no doubt be introduced and if anything, will fast track the legitimacy of Web3 as a means of business setup, operation and governance without the need for a centralised body at the heart of key business decisions.

[28] https://finance.yahoo.com/news/daos-taking-over-wyoming-law-194516224.html

10.0 Conclusion

There's very little doubt that Web3 and the metaverse is likely to revolutionise our lives much in the same way that the invention of the internet has. While Web 1.0 and Web 2.0 have taken (some) of us on a thirty year journey, we also strongly believe that the time it takes Web3 to establish itself firmly in our lives will be considerably shorter. In an interview with Bloomberg, UK-based Dan Hughes, founder of Web3 startup Radix DLT and a cryptographer shared his belief that Web3 has the potential to go mainstream within the next 5 to 10 years with the main hold up of this being down to the trust put into it by mass audiences.[29] It's correct that the main implementers of Web3 technology are those who are perhaps more tech-savvy than others but much in the same way there was resistance towards the internet back in the 1990's and certainly towards social media as a concept in the mid-2000s, there will certainly be a point where, adoption will be wide enough to influence real change. After all, only 65.2% of the world's population use the internet, which has resulted in the online sector from becoming a multi-trillion dollar industry today.[30]

The reality is that with Web3's greater purpose, application and utility together with it's decentralised attributes, the impact it can have on the world's population can be significant. From the way individuals around the world earn and save money, invest in and collect assets (from businesses to tokens), the opportunities are endless. But as with all the previous generations of the internet, there will always be first-mover advantage and that's why even some of the largest organisations have fast-tracked positions to explore this new space in the hope that they're not left behind.

[29] https://www.bloomberg.com/opinion/articles/2022-03-26/web3-will-take-several-years-to-go-mainstream

[30] https://datareportal.com/global-digital-overview

Web 3.0 Glossary

Basic Terms

ADDRESS	a string of characters that represents a wallet that can send and receive cryptocurrency
AIRDROP	a marketing campaign that distributes a specific cryptocurrency or token to an audience via wallets
BLOCK	file with information on transactions completed during a given time period. Blocks are the constituent parts of a blockchain
BLOCK EXPLORER	interface that lets you see transactions on the blockchain
BLOCKCHAIN	a sequence of blocks, or units of digital information, stored consecutively in a public database.
BURN	NFTs or coins are considered “burned” when they have been purposely and permanently removed from circulation
CRYPTO	cryptocurrency, a digital currency that is secured by cryptography, which makes it nearly impossible to counterfeit or double-spend
DAO	decentralized autonomous organization, a blockchain-based org where all involved can have ownership and engage in decision-making
DAPP	decentralized app, any practical application of blockchain and/or cryptocurrency, like mobile games or social sites
DECENTRALIZATION	the transfer of control and decision-making from a centralized entity (individual or organization) to a distributed network
DEFI	decentralized finance, removes the control banks and institutions have on money, financial products and services
ERC-20	simple interface that allows for the creation of tokens on Ethereum that can be re-used by other applications, from wallets to decentralized exchanges
ERC-721	defines non-fungible tokens (NFTs) on Ethereum, allows anyone to create tokens that are completely unique
FIAT	a term for government issued currencies, like the US dollar or any currency controlled by a central authority
FLOOR	the lowest price available for an NFT in a collection, the minimum amount you need to buy one.
GAS	the fee required to conduct a transaction or execute a contract on the Ethereum blockchain
GWEI	denomination used to define the cost of gas in transactions on Ethereum
IMMUTABLE	data cannot be changed or modified by anyone after its creation, the core defining feature of blockchain
INTEROPERABILITY	the ability to see and share information across multiple blockchains

LAYER 2	a scaling solution that promotes mass adoption of the Ethereum platform, provides tools to create scalable dapps that prioritize performance, user experience, and security
MAXI	maximalist, someone who believes that one particular crypto is the only viable one by far and predominantly invests in it
MINING	process where blocks are added to a blockchain, verifying transactions, also how new bitcoin or some altcoins are created
NODE	the most basic unit of blockchain infrastructure that stores data
PERMISSIONLESS	often used to describe blockchains, a system where no entity can regulate who can use it and how
P2E	play to earn
PROOF OF STAKE	a crypto mining system that rewards mining power to miners based on how many tokens they have, is more energy efficient than proof of work
PROOF OF WORK	a mining system involving solving computationally intensive puzzles to validate transactions and create new blocks
SEED PHRASE	a series of words that unlocks your crypto wallet
SELF CUSTODY	only you have the possession of your digital assets because you control the private key, versus holding assets at an exchange like Coinbase
SMART CONTRACT	a piece of code that self-executes once certain conditions are met, like a vending machine but online
SOCIAL TOKEN	a type of cryptocurrency that a brand, community, or influencer can use to monetize themselves
STABLECOIN	a cryptocurrency with extremely low volatility, that has its market value pegged to some external reference such as the USD
STAKING	putting your tokens in to serve as a validator to the blockchain and receive a reward
TOKEN	a representation of an asset, can be held, traded, or staked to earn interest
TRUSTLESS	an environment where there is no centralized authority such as a bank
COLD WALLET	stores digital assets off-line, making them secure from bad actors but more difficult to use
HOT WALLET	is online and easily accessible but also more susceptible to hackers
WHITE/ALLOWLIST	a list of addresses that get early and guaranteed access to mint NFTs at a specific date and window of time

Slangs

ALPHA	early investment advice or information that puts you ahead of the game
APEING IN	buying into an NFT project, perhaps without due diligence
BTFD	buy the f'ing dip, when a crypto price is dropping hard, that's the time to buy in
BUIDL	build useful stuff, when crypto is dipping, building useful stuff proves that it's still valuable.
DEGEN	degenerate/gambler, someone shooting at all chances, possibly taking extreme risks
DYOR	do your own research before you invest in cryptos, buy NFTs etc.
FOMO	fear of missing out
FREN	friend
FUD	fear, uncertainty and doubt
HODL	holding on for dear life when a crypto price tumbles
PROBABLY NOTHING	often used sarcastically to mean the opposite. It probably is something
REKT	wrecked, refers to a crypto trader who is ruined due to losses from a price crash
RUGGED	when developers market a project to generate sales and then abandon it, taking existing profits and the project value (and buyer's NFT) goes to zero
SHILL	unsolicited endorsing in public, promoting an NFT you're dropping or a coin you've invested in
SWEEP THE FLOOR	buying NFTs in bulk at the floor or base price

White Paper

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