PORTAL
ASSET MANAGEMENT

Thematic Report on Web 3.0

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Table of Contents

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DIGITAL FUND

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Web 3.0

"Change the incentives, change the world" – Vitalik Buterin

- Web 3.0 is the paradigm shift towards developing a more democratized internet – an internet that is governed by the collective rather than by corporations
    - It is essentially a new way for us to use the internet without giving up our privacy and valuable data
    - By enabling users to interact directly across open and secure networks, we can move away from relying on trusted intermediaries that can breach our trust
- The Web 3.0 vision is empowered through cryptocurrencies and technological innovation in edge computing, decentralized data networks and artificial intelligence

Background

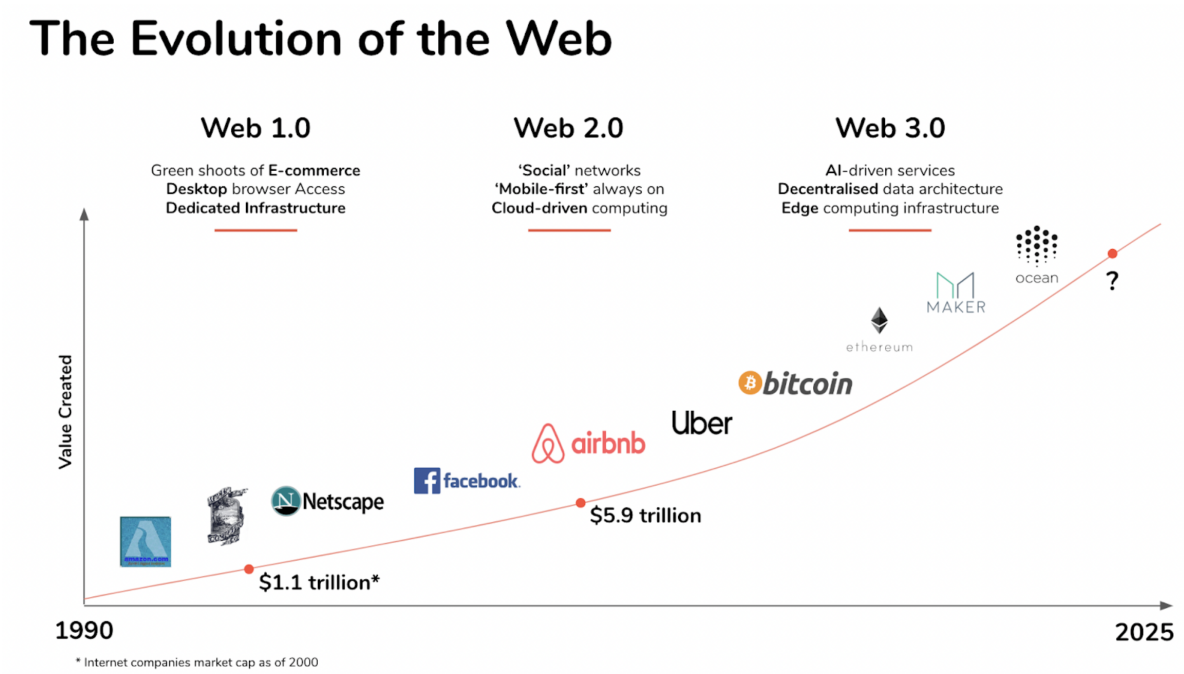
The internet has evolved over time from static sites to a data-driven global marketplace and social playground.

The first phase of the internet, 'Web 1.0', was referred to as the Static Web. It had the ability to display information, but users were not able to change any of this information. Posting, liking, commenting, did not exist. This was the age of digitisation, where we moved information from our encyclopedias, libraries, filing cabinets to the 'read-only' web.

When Paul Krugman (Nobel prize winning economist) wrote that *'the internet's effect on the world economy would be no greater than the fax machine's'*… he likely wasn't aware that the forward-thinking developers were diligently working away on Javascript and HTML5.

These advancements in web technologies ushered in Web 2.0 - the 'read and write' web. New web applications were built with a focus on interaction - users were now able to comment, create and upload content, paving the way for social networks.

With the rise of Facebook, Twitter, YouTube, it changed the internet from a predominantly anonymous place to a more user-trusted world, bringing billions of people together. Smart phones and improved connectivity allowed us to achieve the always online status. These changes in our behaviour, combined with cloud computing making app development more cost-effective, fuelled the mobile app revolution.



Source: Fabric Ventures

There is no doubt that mobile apps and the platform economy benefited our everyday lives - it's transformed how we transact and cooperate with each other. However, as our physical lives become more intertwined with our digital lives, we slowly start to experience the side effects of big tech.

When we use Facebook or Google, we give up our identities, search history, browsing and shopping habits to these mega-corporations. Tech companies are expensive to run and they have shareholders to please. To retain more users, they give away their service for free, ending up with a business model that relies on monetising our valuable data through targeted advertising and even selling our data to third parties.

Facebook's problem with aligning incentives between users and shareholders leads to the dilemma "if you're not the customer; you're the product" – the Cambridge Analytica incident being a perfect example of that.

All our data concentrated in the hands of a few also creates risk that our data can be hacked. In 2017, Equifax's data breach cost 145 million Americans their privacy.

Not only are we sacrificing our security for convenience; but tech giants have become God-like in their power to impose censorship. Although the argument can be made that censorship is due to concerns over posts inciting violence – but should tech companies be the ones deciding arbitrarily what constitutes as free speech?

The current landscape nurtures in the opportunity for Web 3.0 to evolve Web 2.0 into a better, fairer system - decentralized peer-to-peer networks, where no single party controls the data.
In essence, Web 3.0 is the 'unmediated read-write' web. Tech giants can be replaced with applications or services that are controlled by the users, enabling them to control data privacy and data ownership, while also removing the rent-seeking middleman.

Web2	Web3
Twitter can censor any account or tweet	Web3 tweets would be uncensorable because control is decentralized
Payment service may decide to not allow payments for certain types of work	Web3 payment apps require no personal data and can't prevent payments
Servers for gig-economy apps could go down and affect worker income	Web3 servers can't go down – they use Ethereum, a decentralized network of 1000s of computers as their backend

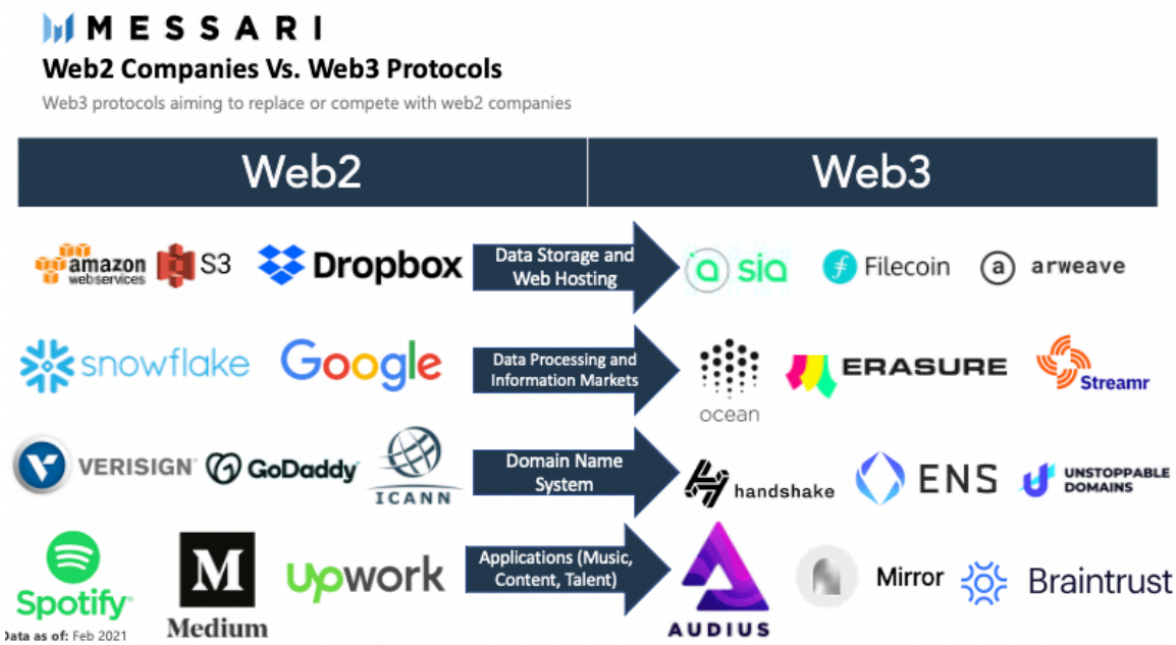
Source: Ethereum.org

Web 3.0 in Action

'Show me the incentive and I will show you the outcome' – Charlie Munger

Web 3.0 is the re-architecting of the internet to realign the incentives in favour of the collective. This process enables a whole new wave of businesses and business models.

Although Web 3.0 is much more nascent than DeFi, Web 3.0 protocols are already competing with Web 2.0 companies on data storage, information flows, domain name systems and applications.



Source: Messari

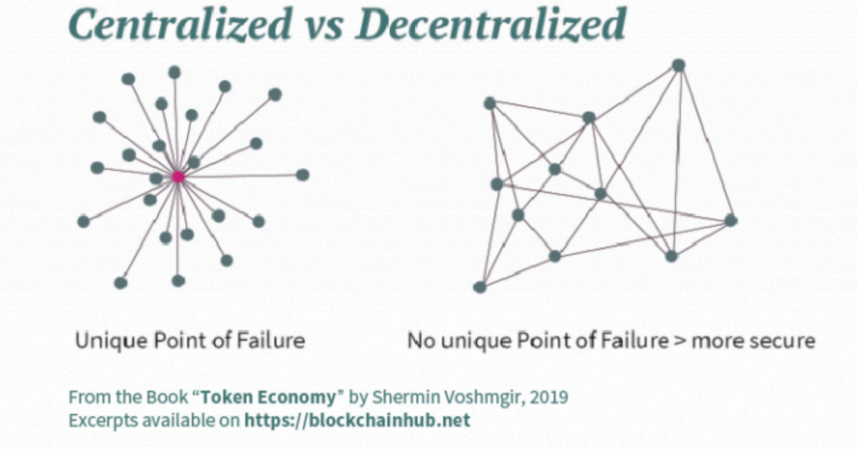
Web 3.0 protocols encompass a broad range of use cases, that aim to achieve:

- Data ownership to end users who have complete control of their data and the security of encryption
- Censorship resistance - no government, company, or institution can restrict access
- Trustless and permissionless applications – transparent, open source networks where anyone can join

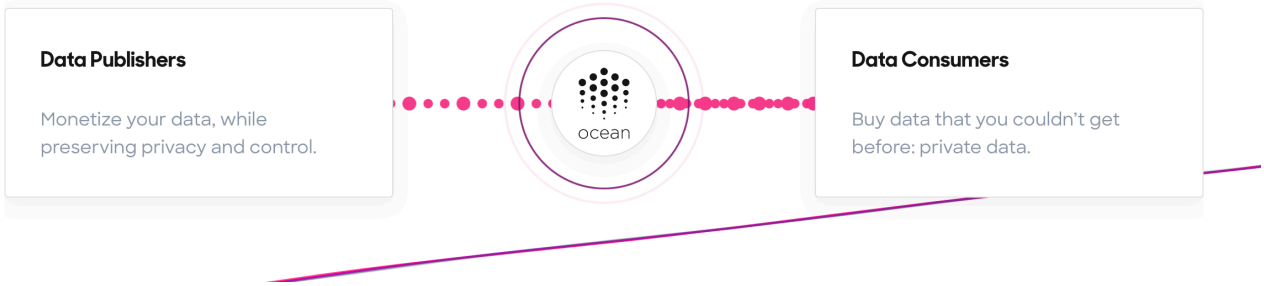
The token plays a key role in aligning the incentives between users and platforms.

Filecoin is a decentralized protocol that's created a free market to bridge the consumers and providers of storage. It enables anyone to rent out spare storage space on their computer or anyone to buy storage on the network.
Founder Juan Benet explains:
"*There's a ton of storage in the world that's not getting used. Think of it like Airbnb. You had people with rooms weren't being used; Airbnb built a marketplace for them.*"

Filecoin competes with centralized storage services such as Amazon AWS and the main difference is that this market is shared and owned by the Filecoin community, instead of one single corporate entity.



Ocean Protocol is a project that's attempting to democratize the value of data, from the hands of internet giants to the actual owners of that data. It's created a decentralized data exchange that connect data consumers with data providers, enabling people to monetise their data.



If history has taught us anything, it is that humans are creative problem solvers, and we are able to cooperate at a scale that is unmatched by any of our peers in the animal kingdom.

Historian Yuval Harari theorises that it our ability to story tell that allows us to cooperate so effectively in large numbers.

"Any large-scale human cooperation—whether a modern state, a medieval church, an ancient city, or an archaic tribe—is rooted in common myths that exist only in people's collective imagination.

By constructing and agreeing to an idea, we create a framework of beliefs that provides us with a common language and rules to live by.

People of the same religion who have never met can pull funds to build a hospital because they believe in the same God. Strangers of the same nationality can risk their lives to save each other because they believe in the existence of their country. Lawyers who have never met can combine efforts to defend someone they don't know because they believe in the existence of laws, justice, human rights and the money paid out in fees.

These constructed fictions, be it limited liability corporations or the concept of money, allow our species to cooperate in flexible ways with countless numbers of strangers.

Technology catapults the speed and ease to which we can cooperate. The invention of the printing press meant that science was no longer a solitary pursuit. It gave scientists, separated by geography, the ability to share findings with great accuracy. The invention of the internet helped disseminate knowledge wider, faster than ever before and at almost zero cost.

At the heart of our ability to cooperate lies two components – trust and network effects.

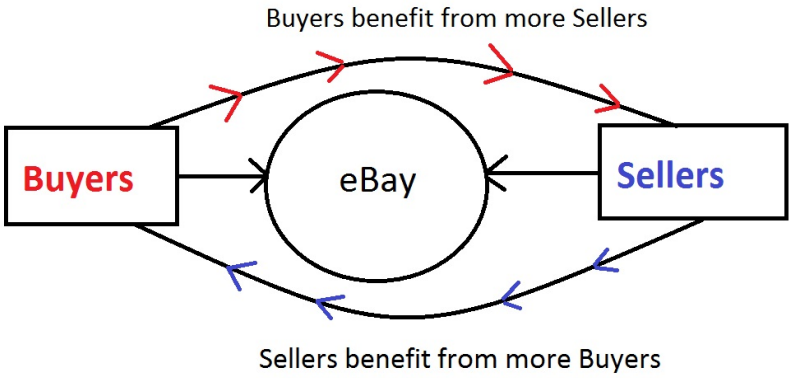
Trust is the belief in the honesty, fairness, or benevolence of another party.

"Trust is the glue of life" – Stephen Covey

The mobile app revolution changed our behaviour at mass scale – we can now trust a stranger's car with Uber and trust our homes with a stranger through AirBnB. Even though we may not trust the other party, our trust in the intermediary lets us transact with a degree of confidence.

Network effects occur when a company's product or service becomes more valuable as usage increases. The term was coined in the early 1970's as academics began to study the growth of the telephone network.

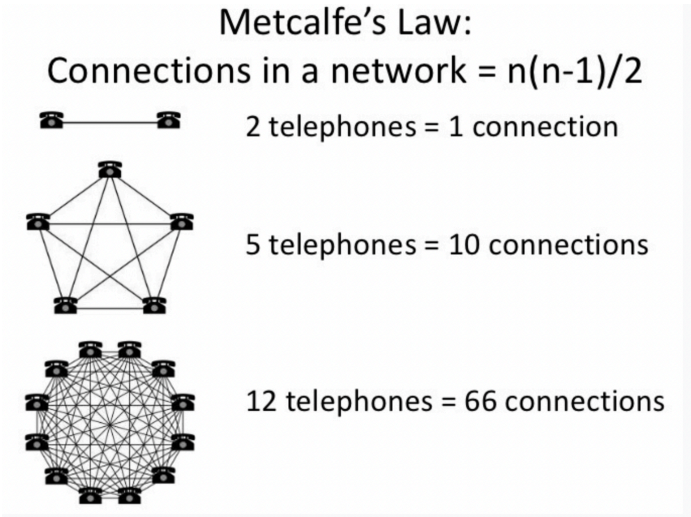
The most obvious type of network effect we see today is the two-sided network effect in marketplaces such as eBay, Airbnb and Uber.



Network effects may seem like they have come into existence due to technology, but they have existed since the dawn of time. Language, religion, physical markets are all examples of concepts grown through network effects.

Our ancestors made their way to the local market because it aggregated buyers and sellers, making trade more efficient. This is exactly what eBay and Uber do with buyers/sellers or riders/drivers.

Robert Metcalfe, inventor of the Ethernet, formulated a concept to describe the power of network effects.



Source

Metcalfe's Law states that the value of a communications network grows in proportion to the square of the number of users on the network (in the above example the addition of 3 telephones increases the connections by 3 squared).

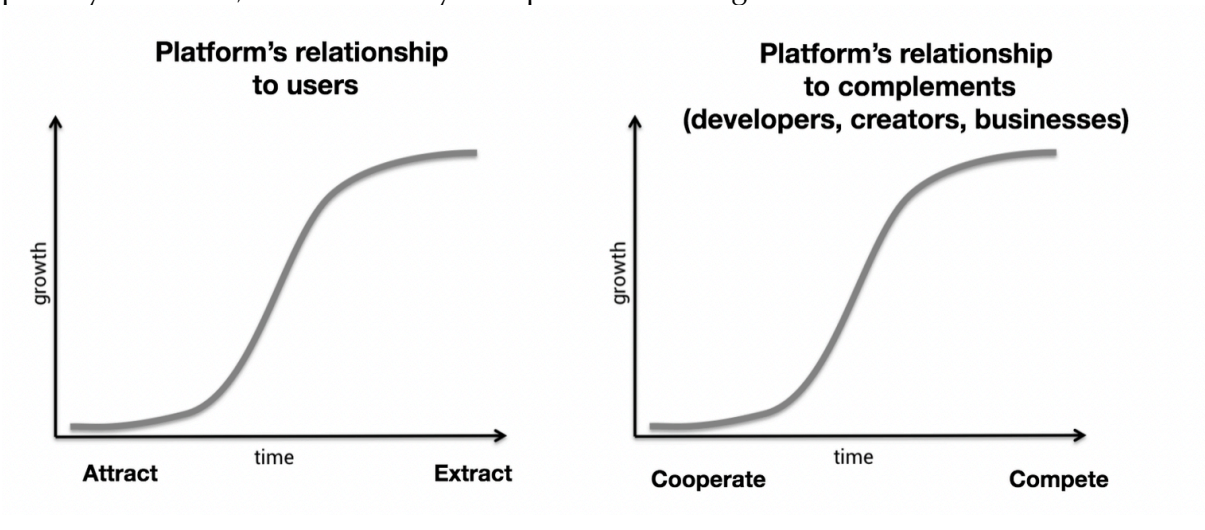
Technology helps network effects grow exponentially and with the invention of blockchain come the ultimate game-changers; cryptocurrencies and Web 3.0. They both build on trust and network effects.

Trust is the ubiquitous layer for all human collaboration and *the* feature of blockchains is trust – making its applications and benefits to different industries seemingly limitless.

Never before have we been able to operate at scale in a trustless, secure environment. With transactions verified by blockchain, Bitcoin enables peer-to-peer payments without a bank. Similarly, Web 3.0 applications create platforms that allows strangers to interact without depending on an intermediary to provide that layer of trust.

This new internet architecture can redesign the incentive structures and force companies to adopt new business models.

The current architecture of centralised platforms is not only rife with data breaches, privacy concerns, hacks but they also produce misaligned incentives.



Chris Dixon describes centralised platforms' life cycle as an S-curve. In the beginning, they do everything they can to attract users, developers, and businesses to build up multi-sided network effects.
However, once they've built those network effects, they switch from 'attract' to 'extract' or 'cooperate' to 'compete' by monetising user data through targeted ads and charging businesses high fees to reach customers.

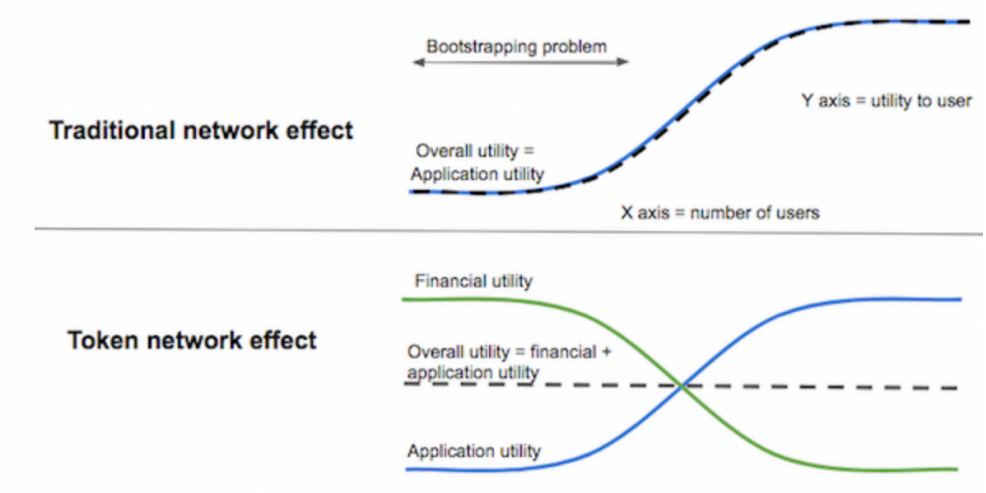
Web 3.0's tokenized networks change all of this.

When a network is owned by a private, centralized company, value flows from users to shareholders. In decentralized, open-source networks they solve the problem of incentive alignment between network creators and network participants by issuing tokens.

Dixon further explains:

"Token networks align network participants to work together toward a common goal — the growth of the network and the appreciation of the token…Moreover, well-designed token networks include an efficient mechanism to incentivize network

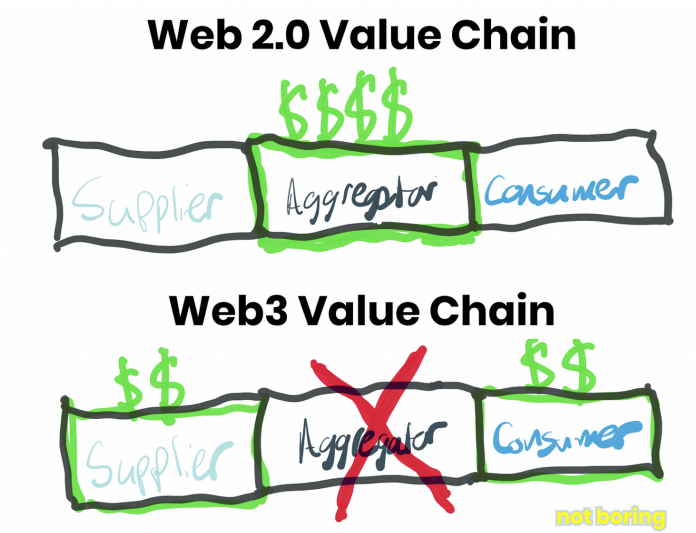
participants to overcome the bootstrap problem that bedevils traditional network development."



Source: Chris Dixon

Token financing offers companies that struggle to raise funds, a lower barrier to entry and a wider market to raise funds from.

Tokens also change how value accrues within the system. Users become the shareholders. Network effect platforms are essentially aggregators - by removing the middleman, value is redistributed to the users and the creators, unlocking an entirely new business model.



Source: Not Boring

Not only do Web 3.0 protocols redistribute value, but they also distribute power. Mirror is a decentralized publishing platform, similar to Medium, but where users own their content and have a say in the governance.
When social networks can no longer monetise our data, they become less valuable, marking the likely demise of data oligarchs.

Jamie Burke (CEO of Outlier Ventures) explores Web 3.0 as it converges with Artificial Intelligence and the Internet of Things into 'The Convergence Ecosystem':

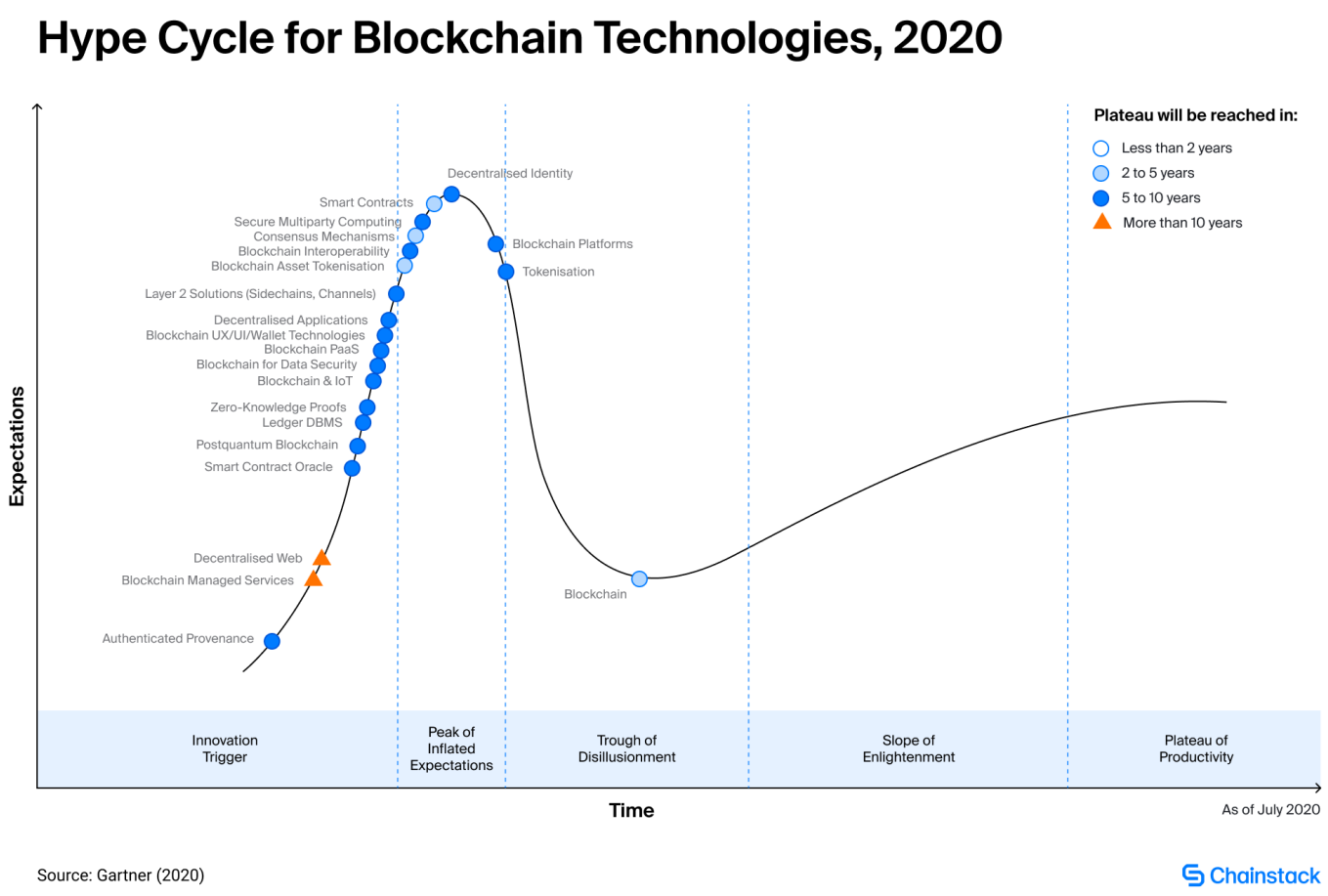
"This will likely become the greatest period of socio-economic experimentation humanity has ever seen, bringing about leaps in technology, economics and governance models…

Different token designs will form an incentivisation system to allocate resources more efficiently.

Successful projects will differentiate through values and trust.

The most successful networks will be those that have inclusive and aligned communities."

As Web 3.0's narrative of better incentive mechanisms spreads, adoption will certainly increase but we are still far from mainstream adoption.



By referring to Gartner's Hype Cycle for blockchain we get the indication that Web 3 (Decentralised Web) is still in the innovation trigger phase. The Web 3.0 market is nascent and highly fragmented with mass adoption still at least 10 years away.
Description of the 5 phases of a technology's life cycle:

No.	Phase	Description
1	Technology Trigger	A potential technology breakthrough kicks things off. Early proof-of-concept stories and media interest trigger significant publicity. Often no usable products exist and commercial viability is unproven.
2	Peak of Inflated Expectations	Early publicity produces a number of success stories—often accompanied by scores of failures. Some companies take action; most don't.
3	Trough of Disillusionment	Interest wanes as experiments and implementations fail to deliver. Producers of the technology shake out or fail. Investment continues only if the surviving providers improve their products to the satisfaction of early adopters.
4	Slope of Enlightenment	More instances of how the technology can benefit the enterprise start to crystallize and become more widely understood. Second- and third-generation products appear from technology providers. More enterprises fund pilots; conservative companies remain cautious.
5	Plateau of Productivity	Mainstream adoption starts to take off. Criteria for assessing provider viability are more clearly defined. The technology's broad market applicability and relevance are clearly paying off. If the technology has more than a niche market then it will continue to grow.[1]

Source: Wikipedia

In the past, it's taken 20 years to see the commercial impact of an innovation:

	Invented in:	Commercial impact in:
Steam Locomotive	1804	1825+
Aeroplane	1903	1923+
Internet	1983	2003+

Source: Dhaval Joshi – BCA Research

When the Wright brothers invented the plane they were met with widespread scepticism from both the general public and scientific community. People did not believe that it was possible for humans to fly, it took 5 years for the Wright brothers to sell the plane.

Technological innovation often comes with the need to adopt a new way of thinking and leave behind an old belief system that no longer serves the greater good.

Our faith in fiat money is now being tested while crypto is slowly getting adopted as a new belief system and an emerging asset class.

It's not often a new asset class is born, many do not see one in their lifetime, making it difficult to price. Unlike other asset classes, which have utility-based demand, monetary assets resemble a bubble because the utility is in the collective speculation itself.

Matt Huang (Co-founder of Paradigm) details this phenomenon in his thesis 'Bitcoin for the Open-Minded Skeptic';

'Each bubble leads to broader awareness and motivates Bitcoin's underlying adoption, gradually expanding the base of long-term holders who believe in Bitcoin's potential as a future store of value.'

Web 3.0's success will depend on the success of Layer 1 adoption. Bitcoin and Ethereum have proved successful so far in becoming Layer 1 native money. Investment theses on bitcoin and crypto have been explored in depth by many brilliant minds, however, therein also lies a moral case for crypto adoption.

By analysing money as an intrinsic human need for security/safety it allows us to see the moral case. Inherent in all of us is our instinct to survive. Our need for safety comes in second on Maslow's hierarchy of needs.

Source: Simple Psychology

Money is a tool that all humans use to trade our time and alleviate the uncertainty of the future. Central banks through their manipulation of the money supply, create more uncertainty as they reduce people's purchasing power. It becomes, in the words of Robert Breedlove *'a game with ever-shifting rules designed to disfavour those already dispossessed in the socioeconomic hierarchy'*. If a country kept changing the rules of soccer, would anyone want to keep playing?

It's with no surprise that millennials and Gen Z are drained of morale, hope in acquiring traditional assets and are incentivised to spend more and save less.
History of human ingenuity suggests that they are likely to seek novel and more effective ways to fulfill their needs.
Will they use their energy to fight a system that's priced them out of assets, propped up by money printing, with value unfairly distributed via the Cantillon effect?
Or will they opt into a system that aligns incentives and builds a new decentralised infrastructure that can solve technical, societal, and economic problems?

One may argue that the purpose of money printing is (in Breedlove's words) *'to smooth the seas of markets by imposing price stability and low unemployment.'* However *'this misguided purpose inflicts a depravity on market participants by robbing them of the critical stressors necessary for learning and the development of competence.'*

Time and attention are precious finite resources. Centralised social media companies are incentivised to collect more data and fine-tune algorithms to maximise our time on their sites. Central banks and social media platforms are not inherently evil, but when the incentives are not structured right, we see them exploiting human time and attention.

Crypto and Web 3.0 offers people an alternative to their current system. It paints a compelling narrative, one that aligns incentives. However, the economy and blockchain are beautifully complex machines that are hard for those who don't have the time or patience to understand.
The case for crypto and Web 3.0 extends beyond logic and crosses into morals. Kids may not understand macroeconomics and business models, but they do understand the concept of freedom, fairness, and equality of opportunity.

Harari points out that humans are the only species capable of dramatic, large-scale shifts in behaviour by collectively changing the narrative.

Lions may never banish the idea of the alpha male lion... but we can decide slavery, one of the oldest institutions in human history, is no longer acceptable. We can declare monarchy an outdated form of governance. We can decide females should have the right to as much power as men.

Behind the Web 3.0 vision is a revolution in human behaviour. It takes effort to adopt a new technology and those most willing to take risks and make effort are those who were disadvantaged before that technology existed.

Investing in Web 3.0 is a challenging exercise requiring skill, patience, and an understanding of increasingly complex and interdependent technologies. Money is also a medium through which we can express our preferences and values. As investors we can empower social change - helping to build a decentralised network and provide the resources for a more open and secure society.

Empires rise and fall, sowing the seeds of their own destruction.
World reserve currencies come and eventually go.
Technology will keep evolving.
The only constant in life is change.

Society is only just beginning to awaken to the importance of decentralisation… society's consensus will make the Web 3.0 shift inevitable.

"This shift will not occur overnight. People will continue to focus on the price of crypto-assets and worry about the regulatory implications of public token sales. But behind the scenes, a new decentralised infrastructure is being built. Network by network. Protocol by protocol." – Jamie Burke (Outlier Ventures)

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