



THE OPEN METAVERSE
UNDER ATTACK; ❌❌❌
THE FIGHT BACK

Outlier Ventures°

The Outlier Ventures State of Web3 thesis

TABLE OF CONTENTS

Introduction: The Open Metaverse Revisited

What's Changed Since 2021?	[05]
Context and Format for this Thesis	[06]

The Open Metaverse Under Pressure

Threats to Web3 and the Open Metaverse	[08]
Tornado Cash: The Attack on Cryptography & Decentralization	[09]
The Coercion of Stablecoins	[10]
Criminalization of Network Participation	[11]
Capital Constraints and the Threat of Monopolies	[12]
In Summary	[14]

The Risks of Web2.5

Alternatives to The Open Metaverse	[16]
A Perpetual, Not Transitory Web2.5	[17]
Royalties Rollbacks & the Open Creator Economy	[19]
MEV Wars & the Rise of Appchains	[20]
Cross-Chain Bridges; The Challenges	[21]
In Summary	[22]

Innovation and Opportunity in The Open Metaverse

Composable Creativity & the New Creator Economy	[24]
Zero Knowledge Proofs: AI's Trust Layer	[25]
Ukraine; A Battlefield for the Networked State	[26]
ReFi; A Truer form of Financial Inclusion	[27]
Dynamic NFTs & Creator Royalties Guarantees	[29]
In Summary	[30]

Conclusion: The Way Forward

Possible Paths Forward	[32]
Extending the Benefit of Composability	[33]
Decentralized Identity & the Web3 Social Graph	[34]
dCommerce & Connecting Real World Assets	[35]
Beyond Generative AI, Towards Agent Based Systems & AEs	[36]
A Call to Action	[38]

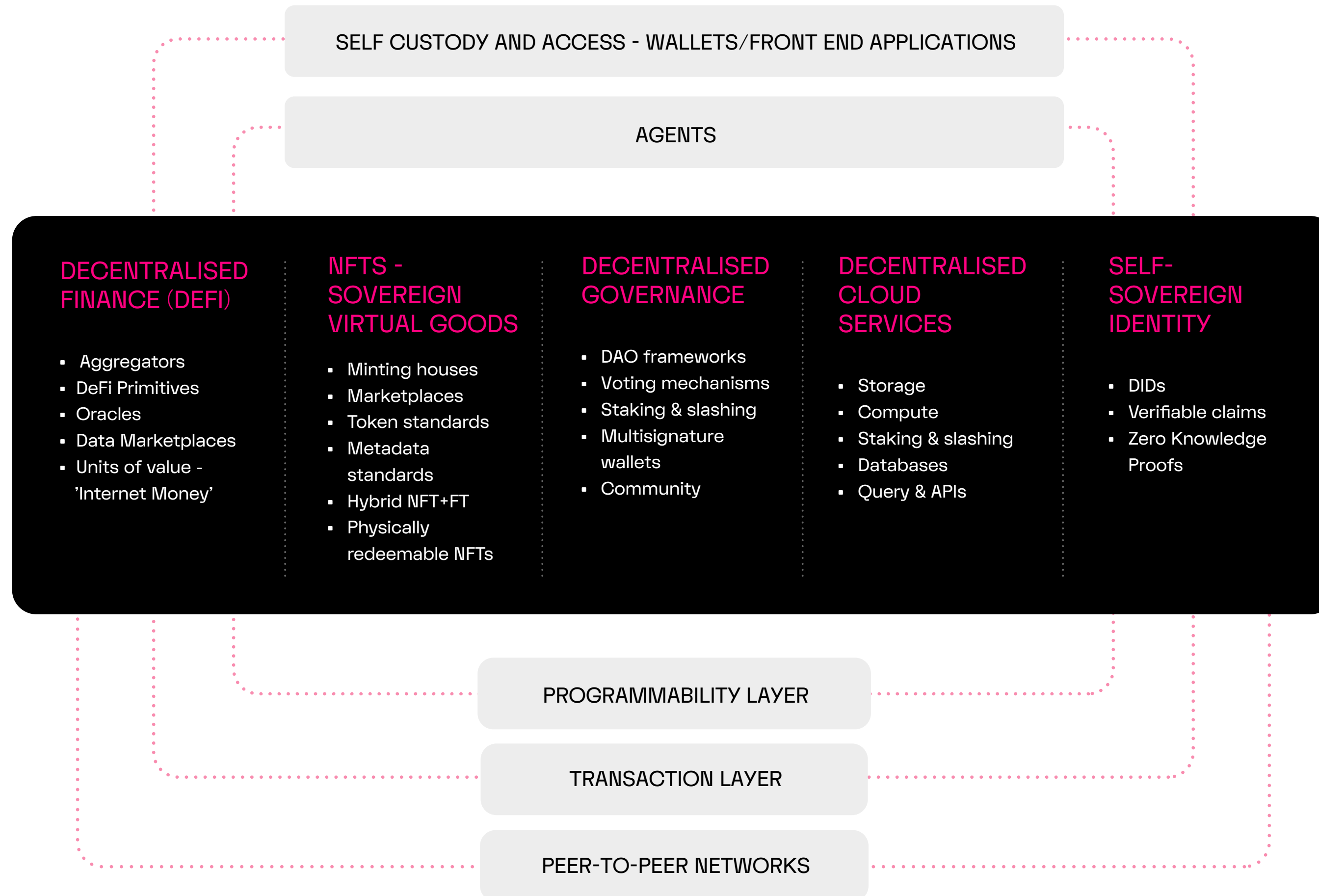
01

INTRODUCTION:
THE OPEN METAVERSE
REVISITED

Whilst the future of The Open Metaverse is still an open question, we want to offer up a vision for this radical new economic system.

A vision whereby Web3 serves as a trust machine for a more Open Metaverse, not only for crypto and digital assets, but the wider consumer internet.

WHAT'S CHANGED SINCE 2021?



A note from Jamie Burke CEO and Founder, Outlier Ventures

It's been more than two years since we originally published The Open Metaverse OS, where we outlined that [The Open Metaverse](#) is not a single-game, augmented or virtual reality environment. Rather, The Open Metaverse is an open economic system across an increasingly immersive Web that blurs the distinction between a physical and virtual reality for all human (and synthetic) activity from work, play, social to commerce.

In those two years, a lot has happened. While The Open Metaverse has continued to evolve in new directions, what has emerged is a more centralized alternative, being sold as a detour on the route to a decentralized destination. In this alternative vision for the metaverse, permissionless has become permissioned, and communities have become gated rather than seamlessly connected.

We're aiming to explore these two distinct camps, the tensions between them and the opportunities they present for founders and builders working in the space.

It is our premise that as AI blurs the boundaries between what is fact and fiction, or even what we can objectively call reality, Web3 technologies and primitives have a unique opportunity to serve as a trust machine for The Web at large.



CONTEXT AND FORMAT FOR THIS THESIS

This is a continuation of both a thesis titled [The Open Metaverse OS \(Jan, 2021\)](#) but also previous papers defining Web3 as a New Data Economy and the coming convergence of blockchains, and blockchain-like technology, AR, VR and perhaps most importantly AI.

The purpose of this thesis is to look at the emergent themes we have been developing over 2023. More importantly though, it looks to imagine their future implications if they happen at scale.

Rather than necessarily propose answers, this thesis asks questions, provokes thought, and lays out concepts that are worth further exploration and debate.

The structure of this thesis is designed to hit home the existential threats encircling The Open Metaverse.

[Section 2](#) explores the direct threats, both from a regulatory and centralizing perspective.

[Section 3](#) highlights some of the less visible, but equally important threats to The Open Metaverse. Namely, how Web3 technology is at risk from becoming subsumed by more traditional, hierarchical systems of ownership.

[Section 4](#) discusses these opportunities in more detail, showcasing the projects Outlier Ventures has invested in that help keep The Open Metaverse evolving.

[Section 5](#) charts a way forward from this point, while inviting you, the reader, to take part in shaping the direction of this set of ideas.

This report also highlights the continued innovation and development from proponents for The Open Metaverse, and the technology that allows this world to develop alongside others.



The Open Metaverse OS
(Jan, 2021)

[CLICK TO READ](#)



02

THE OPEN
METAVERSE UNDER
PRESSURE



THREATS TO WEB3 AND THE OPEN METAVERSE

There are a series of macro events around the Web3 space that are profoundly impacting the environment that The Open Metaverse operates in. Here, we explore and present a selection that we believe has had the greatest impact on the trajectory of The Open Metaverse.

These threats, from the shifting regulatory environment to the increasing centralization of technology and the emergence of monopolizing forces, all pose threats to the evolution of The Open Metaverse proper, to such an extent that it could prevent it from fully materializing.

It's our contention that the metaverse is under attack from all directions, and we're giving an overview of some of the most profound ways. This is by no means an exhaustive list. The Web3 space moves incredibly quickly, creating new opportunities, but also new threats to this space that continually evolve.

By showcasing these threats, we hope to bring awareness to the fragility of a decentralized, open-source Web3 world; one that could be lost without consistent defense. This and section 3 address this from different perspectives. While this section looks at direct threats, Section 3 showcases alternate visions where Web3 values are subsumed into those of Web2 in a system commonly known as Web2.5.

Platforms are interested in the benefits of Web3, whilst reducing disruption to their business models and user moats. Governments want to limit and restrict Big Tech monopolies, but are threatened by Web3's championing of digital property rights and sovereign agents.

TORNADO CASH: THE ATTACK ON CRYPTOGRAPHY & DECENTRALIZATION



[Tornado Cash](#) was a privacy based smart contract ‘tumbler’ that allowed the ‘mixing’ of crypto to mask its source. One of its creators, a Russian national living in the Netherlands, was arrested by Dutch authorities in Amsterdam.

OFAC (U.S. Treasury Department’s Office of Foreign Assets Control) [blacklisted Tornado Cash](#), making it illegal for United States citizens, residents, and companies to receive or send money through the service, citing Tornado was used by North Korea-sponsored hackers, the Lazarus Group, and issued an arrest warrant. Immediately, Github censored Tornado Cash’s repo, demonstrating another example of indirect state capture of centralized platforms through compliance.

This represents an attack on open source technology as a whole which is the bedrock of The Open Metaverse.

In particular, ideas around code as a form of freedom of speech (an argument first put forward by hobbyists experimenting with cryptography in the 1990s) and by virtue

the permissionless and open nature of crypto and DeFi’s ‘unstoppable’ nature.

It didn’t stop there. Circle, the company behind USD Coin, [froze \\$75,000](#) in USDC from Ethereum addresses belonging to the mixer and many exchanges, in particular those with US customers, in order to comply with law enforcement agency requests. Centralized exchanges blocking wallets is part of a wider trend that was already in process before the Tornado Cash arrests. Privacy based coins such as Zcash and Monero have been delisted from several major exchanges, making it harder for users to access and use.

Furthermore, The Merge has changed the vectors of censorship in Ethereum. High profile validators have already begun to censor certain addresses and transaction types. Large custodians, exchanges, cloud services (like [Alchemy](#)), and even decentralized RPC relayers (like [Pocket](#)) have effectively become OFAC-compliant, overnight hitting nearly 80% of network validation in mid-November 2022. Although it should be noted that this has since trended back down to 65% by the end of 2022.

THE COERCION OF STABLECOINS



Stablecoins are the economic foundation of The Open Metaverse. They serve as a hedge against the volatility that comes with a new economy, while also creating a bridge that connects them to the ‘real world’.

Understandably, this is also the area regulators are most concerned about due to fears that they could transmit wider systematic risk beyond the crypto economy as institutions add them to their balance sheets.

Therefore, they are a careful battleground and negotiation between two, for now parallel, financial systems. Today, two of the top five (representing 27% of all stable coins), including USDC (Circle) and BUSD (Binance), are officially regulated in the US and three, including USDT, can blacklist addresses and freeze transactions whilst there are just two ‘censorship resistant’ stablecoins in DAI and FRAX.

As explained by the [Centre Consortium](#), founded by industry leaders Coinbase and Circle, “they only block addresses when they are legally required. [this includes] court-ordered interventions, as well as sanctions compliance following U.S. and international rules”. Whilst they say these rules are “designed to protect privacy, and promote competition and interoperability” it even being a possibility should be of concern to the industry.

As recently as January 2023, cryptocurrency exchanges operating in the Canadian province of Ontario were prohibited from listing USDT. And Europe’s Crypto-Assets regulations ([MiCA](#)) which will take effect in 2024, effectively places a ban on algorithmic stablecoins, something the US is itself also exploring, posing further risks to this cornerstone of The Open Metaverse.

CRIMINALIZATION OF NETWORK PARTICIPATION



The point of Web3 is its permission-lessness. From mining or staking and securing the network, to building DApps or voting in its governance, users can be owners of networks at all stages of their growth.

This creates better alignment between stakeholders, and provides a viable alternative to the shareholder supremacy of Web2. In fact, in many ways the ability for a wide base to participate in a given network has even become the criteria by which to judge how regulators decide if a network is decentralized or not.

However, network participation itself is increasingly under attack. From something as simple as the act of self custody, new EU policy currently under consideration seeks to re-categorize them as "unhosted wallets", with the ultimate goal of making them illegal. In the US too, policy is turning against staking as a form of network participation, and could, if left unchecked, restrict participation in networks like Ethereum.

SEC Chair Gary Gensler, has even said proof-of-stake cryptocurrencies could be investment contracts that subject them to securities regulations.

The implications are that the U.S. Treasury's Financial Crimes Enforcement Network ([FinCEN](#)) could require all businesses operating on the Ethereum network to comply with KYC and AML requirements. In practice, this would mean customers would have to verify their identities and residencies, as well as provide further information to service providers before they can start using a DeFi service.

Furthermore, recent precedents in the [Ooki DAO legal case](#) suggest that people voting in DAOs could be liable for its future actions.

CAPITAL CONSTRAINTS AND THE THREAT OF MONOPOLIES



As capital becomes more constrained and business operations come under pressure in market downturns, many founders will be forced to sell out to bigger rivals through a process of M&A. This will mark a period of market consolidation highly likely in 2023 and beyond.

This is all the more possible as equity snuck back into vogue for early stage startups during 2022. Where previously investors may only have had exposure through a SAFT (a promise of a future token with no shareholder rights) they are now firmly on the cap table as shareholders can push for a continued focus on equity value creation over launching a decentralized and tokenized network. As the market appetite for

new tokens declines, the pathway to tokenization extends the likelihood of acquisition along the way.

This may mean not just fewer tokens, but also less open source code as the number of companies decline through either Web3 consolidation or defensive acquisitions from Web2 incumbents to kill off threats.

We saw this process writ large in the months leading up to the FTX collapse in 2022. [Sam Bankman Fried](#) capitalized on the fallout from the failure of Luna stablecoin by buying up the distressed assets of rivals, earning him the then, and somewhat ironic, moniker ‘Saviour of Crypto’.

Post FTX, Binance now represents an even greater force in crypto with a [66% market share in trading volume](#). This is all the more concerning as Binance is unilaterally controlled by one shareholder, its founder [Changpeng Zhao](#).

Such is its/his market dominance and power, that Binance announced last September that they were consolidating USDC, USDP and

TUSD into their own stablecoin BUSD. The rationale behind this move was to increase capital efficiency and liquidity on the exchange, however this overt power grab raises antitrust questions and demonstrates how much power he and Binance yield over the market more broadly. How to even manage antitrust in crypto and Web3 is going to be a growing concern.

In a system predicated on decentralization, there is no way to look at this in a positive light even if you assume [Changpeng Zhao](#) is benevolent.

It’s not just at Binance we can see market consolidation: we have seen several acquisitions from [Nike’s RTFKT](#) to [Yuga Labs](#), to our partners [Animoca](#) and our own portfolio company [Futureverse](#) with its \$100m+ Roll-Up. This isn’t necessarily bad and some may argue is a process of bundling and unbundling that has historically always happened with information technologies but its extent is something we as an industry need to constantly monitor and interrogate.

A futuristic, dimly lit control room or cockpit. The room features large windows on the left and right, showing a hazy, blue-tinted view of a city or industrial landscape. The ceiling is dark with intricate, glowing blue and white patterns. The floor is dark with several glowing red rectangular panels. In the center, there are two dark, rounded objects that look like seats or control consoles. The overall atmosphere is high-tech and mysterious.

In a global environment deliberately distributed outside any one jurisdiction, how do we as an industry protect ourselves from unhealthy levels of M&A, monopolistic behavior and antitrust?

IN SUMMARY

Binance was stopped from acquiring Genesis by US regulators but only because they were a regulated financial services entity. Nonetheless, that has not stopped the exchange buying Voyager's assets. These sorts of moves will affect how The Open Metaverse evolves, as it becomes more difficult to defend against centralized interests.

Furthermore, we have already seen – in governance attacks and builder centralization on Ethereum – how unbridled free markets trend toward monopolies, showing that different types of capital all seem to benefit from economies of scale.

While in the short term, that may help increase participation in the Web3 space, we contend that this could ultimately work against our vision of an open-source, decentralized world where assets, ideas and people and their wealth and data are free to move between platforms and jurisdictions.

Historically we have seen countless examples where large incumbents have made it difficult for rivals to flourish or simply acquired others as a defense against a loss of market share. While many put such moves down to the changing nature of markets, it is our contention that without an alternative, this ultimately leads to an erosion in the sovereignty of all users.

Google, Amazon, Facebook and Apple, have **all been fined** for abusing their size and influence over the markets they operate in. There are other issues, too: namely that surveillance and security become increasingly concentrated in fewer hands.

Dystopian examples of data and technology being used to erode civil liberties are becoming **increasingly commonplace**. With the censoring of the Ethereum network by OFAC in 2022, Web3 is facing its own tipping point.

Unless fixes are found, this could mean that The Open Metaverse is less innovative or disruptive than originally envisioned.



03

THE RISKS
OF WEB2.5





ALTERNATIVES TO THE OPEN METAVERSE

While Section 2 explored the threats to The Open Metaverse, this section explores how the very idea of the metaverse has fragmented since the original thesis was published.

In particular, we chart the emergence of Web2.5 as a halfway [but perhaps permanent] step between Web2 and Web3, the erosion of royalties in the digital assets space and the emergence of walled gardens across the entire ecosystem.

While the building blocks of an Open Metaverse are present in all of these, they represent an alternate vision, whereby centralized entities increasingly capture IP and communities for profit maximization, making it more challenging for assets, ideas and people to move seamlessly.

A PERPETUAL, NOT TRANSITORY WEB2.5

Many commentators laud the adoption of blockchain technology by Web2 giants – from Reddit to Google and Instagram – as gateways to billions of users. Each represents a shorter pathway to mainstream adoption and potentially billions of users whilst bringing legitimacy to our fledgling industry. However, it inevitably comes with trade-offs and risks.

Web2 platforms are owned and operated by highly centralized and regulated companies. As we saw with Facebook’s Libra project, these tend to be highly restricted in what they can do. Large, centralized Web2 services such as Meta, Amazon or WeChat in Asia, are vulnerable to capture and coercion by state actors, meaning any exploration of a permissionless, censor resistant metaverse would likely be contained.

A great example of the implied risks was the [roll out of NFTs by Instagram](#), even when leveraging protocols like Polygon and Ethereum. Users were encouraged to connect their Facebook Social Graph to their wallets ie. their social to

their financial graph. This represents the Holy Grail for a media and advertising company, but significantly exposes the user and presents an irresistible honey pot of data to the various surveillance states Meta operates in are simply bad actors, fraudsters and hackers

On the flip side, it allowed Meta and others to present a ‘safer’ Web3 halfway house, which we fear is likely a perpetual rather than transitory, Web3. Here, transactions can be reversed and censored, and users and developers can continue to be deplatformed. In short, this is a far cry from the permissionless The Open Metaverse we should aspire to.

The question is: how can Web3 and The Open Metaverse tap into Web2 user bases without getting diluted, or how can we make sure Web2.5 is a stepping stone to Web3 rather than an end in itself?

While Meta has announced that it is [ending its exploration of NFTs on its platform](#), there are other Web2 companies that are deepening their integration of Web3 technology. One of those is Reddit and its [avatar program](#) that allows users to mint their own PFP NFTs without having

to navigate traditional Web3 primitives such as wallets and buying/spending tokens.

Another company that has abstracted the Web3 experience away from the UX is Starbucks. Its [Odyssey Experience](#) has allowed customers to collect NFTs to unlock access to new immersive experiences, which has proven to be enormously popular.

Their NFT collections have been selling for thousands on the [open market](#). This merging of Web2 and Web3 experiences can be positioned as a Web2.5, but it will be the platforms themselves that will determine if it is permanent, reversed or transitory.

While at this stage, it has allowed millions of users to access Web3 technologies, a more dystopian future might emerge if left unchecked. We call this the “WeChat of Crypto”.

In this future, your financial and personal digital worlds would be merged into one singular super app experience, and therefore singular user profile. This could be in full capture by a given state, where you can be denied your basic civil rights and opportunities, or excluded entirely from society and the economic potential of the metaverse on a whim.

OPEN OR CLOSED METAVERSE?



WEB2

Interest in blockchain by corporations, regulators, investors

WEB2.5

- Web2 frontend with Web3 backend
- Games and products which incorporate NFTs

PERPETUAL WEB2.5 - CLOSED METAVERSE

- Corporations control data
- Reversible transactions
- CDBC's
- Erosion of royalties in the digital assets space
- "Walled Gardens"

WEB3 THE OPEN METAVERSE

- Transparent on-chain transactions
- Data ownership
- Decentralized identity
- NFT royalties
- Agent-based AI systems
- De-Fi and stablecoins



ROYALTIES ROLLBACKS & THE OPEN CREATOR ECONOMY

Royalties have been a powerful argument as to why creators should use Web3; giving them direct control of how their IP is monetised and used, with smart contracts perpetually managing its rules across not just primary but secondary markets with surety.

This is also the bedrock of The Open Metaverse's promise of enabling composable markets of IP that can be combined and recombined in infinite ways. New marketplaces like [X2Y2](#), [LooksRare](#), [Magic Eden](#) and [Blur](#) have challenged the sanctity and enforceability of royalties in secondary markets. All have explored a race to the bottom zero fee strategies to build market share, often at the expense of creators. This presents a significant barrier to the royalty system becoming a foundational part of the Web3 economy.

The idea that smart contract based royalties, or any form of codified IP rights, can be blocked or ignored by secondary markets when it suits undermines the argument that "code is (in some way) law in Web3." This would also act as a disincentive for large IP owners considering bringing their highly valuable content to Web3. Until this is resolved technically or through legal precedent, growth will likely be sluggish.

MEV WARS & THE RISE OF APPCHAINS



Walled gardens and closed communities have become increasingly commonplace in Web3 as a response to the challenges of running open and transparent blockchains.

Ethereum is perhaps the best example of how transparency has brought opportunities as well issues. [Maximum Extractable Value](#), or MEV, is a concept that allows market participants to extract value from order books.

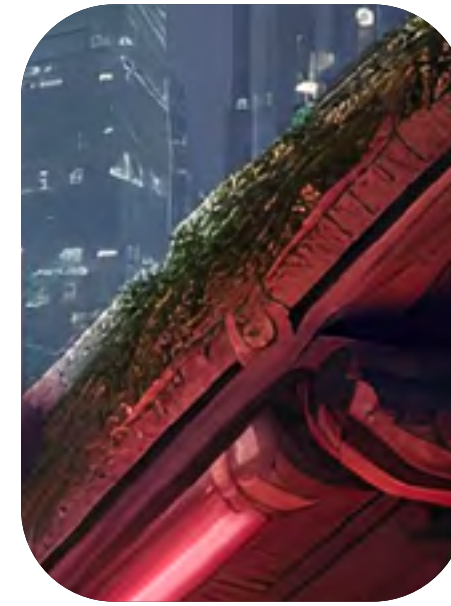
While the design of Ethereum V2 allowed miners and validators to accrue MEV, a large portion of MEV is extracted by independent network participants referred to as "searchers."

Searchers run complex algorithms on blockchain data to detect profitable MEV opportunities and have bots to automatically submit those profitable transactions to the network. These have become commonplace, especially those designed to [exploit price discrepancies and low liquidity volumes](#).

The move to [Proof-of-Stake \(PoS\)](#) accelerated their development, as validators, instead of miners, now control transaction inclusion, exclusion and ordering. This is likely to lead to a creation of solutions and products that protect market participants from searchers at the expense of an open and transparent ecosystem.

[Private Order Flows](#) are one such example. These private relays keep transactions outside of the public mempool to avoid attacks. Companies who build and maintain these are likely to become powerful intermediaries, as users seek better protections from profiteering. This additional layer of middle men is likely to lead to a centralization of order book information, taking key parts of the Ethereum blockchain further away from the decentralized ideals of The Open Metaverse.

CROSS-CHAIN BRIDGES; THE CHALLENGES



While blockchains historically have attempted to provide all four functional layers on one chain (execution, settlement, consensus & data availability) more recently there has been an increase in the number of solutions that offload portions of transaction data to help improve scalability and speed.

Some of the most popular are rollups, or Layer 2's. These are side chains built on top of Ethereum that use the Ethereum mainnet as the settlement layer only. They can be thought of as a separate execution layer that sends bundles of transactions back to mainnet for verification.

Another is appchains, or application-specific blockchains, which are a customizable blockchain environment with their own consensus mechanism designed to help app makers create bespoke environments for projects.

While these are novel solutions that have brought more users to the Web3 world, they ultimately raise more barriers between chains than they lower. Making chains more complex means creating meaningful connections becomes harder.

Bridges are now widely regarded as the biggest risk to security thanks for the increasingly complex nature of the chains using them.

While solutions like atomic bridging are actively being explored, it means more friction between chains. Being able to move NFTs and DeFi apps across execution layers is a fundamental pillar for The Open Metaverse, but it remains elusive.



IN SUMMARY

There has been a rapid development of technologies, ecosystems and mindsets that have emerged with a different set of ideas to that of The Open Metaverse.

While most were designed and implemented to help scale blockchains and increase users, there is increasingly a view that if left unchecked, these innovations would stall the vision of Web3 laid out in our [original thesis](#) at the Web2.5 stage, with little incentive to re-open ecosystems once those walls had been built.

In the next section, we'll shift our focus from challenges to opportunities, exploring how borderless technologies have continued to develop and provide opportunities for The Open Metaverse to continue to flourish.



04

INNOVATION AND OPPORTUNITY IN THE OPEN METAVERSE



COMPOSABLE CREATIVITY & THE NEW CREATOR ECONOMY

- New system of ownership over prompts, IP, and royalties
- User privacy
- Generative player-based game production
- MetaFi and tokenized AI

WEB3 TRUST LAYER

- Soulbound Tokens
- Zero Knowledge Proofs
- Dynamic NFTs



AI, GENERATIVE AI, AND
AGENT-BASED SYSTEMS

COMPOSABLE CREATIVITY & THE NEW CREATOR ECONOMY

In the penultimate section of this thesis, we explore some of the most promising opportunities and innovations across The Open Metaverse. While this report has highlighted the threats to an open-source, decentralized world, there are an increasing number of technical and regulatory innovations that could foster growth.

It's our contention that development of primitives around The Open Metaverse continue at pace, and when considered in aggregate, have promising applications beyond what is narrowly understood as Web3; in particular, artificial intelligence (AI), generative AI and agent based systems, and the role Web3 could play as a trust layer for its economy.

ZERO KNOWLEDGE PROOFS: AI'S TRUST LAYER

This is a vital component of The Open Metaverse, as it allows the movement of data and people to occur in a trustless, private environment for the IP and data for enterprises. Projects like StarkEx, Miden, Metis and others have all helped push Zero Knowledge technology to the forefront of blockchain development.

While we normally think of Zero Knowledge proofs in terms of identity and financial applications, they can also be a powerful tool for researchers who need to train AI models without compromising on data availability and integrity. Although the computational technology for this may be a way away, we believe that ZK proofs present strong possibilities for scaling AI.

Perhaps a bigger role for Zero Knowledge is its role as a counter to the rise in artificial intelligence.

If teams can prove to each other the integrity of their work without showing the data they have used, this removes that particular obstacle. We also need to remember that the future of AI depends on our willingness, as companies and individuals, to let our data be used for training.

ChatGPT, arguably the most publicly well-known AI application, is the fastest-growing app of all time, recording 100 million active users within two months of launch. It has also evolved at a similarly startling pace. GPT-4, is the fourth generation of the AI's abilities, and can now accept both text and images as input, allowing charts and graphs to be autonomously analyzed.

The robust use of privacy tech such as Zero Knowledge proofs is a necessary prerequisite for AI's continued growth and success. As openly available data dries up, without these guarantees, the supply of good-quality data (and in particular specialist data to increase the domain expertise of AI) won't be made available, limiting its potential for impact.

To achieve this lightning growth, AI systems have ingested vast amounts of data from what is referred to as The Open Web data to train the models of the future, which raise questions and concerns about both IP and privacy.

If we look at our own portfolio, we see companies, such as [Ocean Protocol](#), tokenizing initiatives for AI, creating markets for a truly new kind of Data Economy built around financial incentives for sharing data and training AI models.

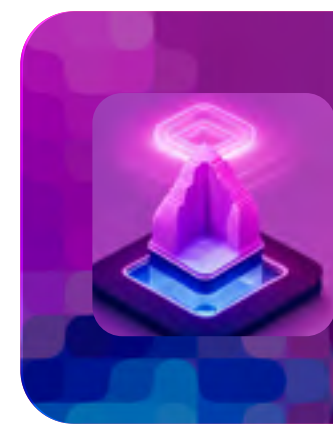
While [GDPR](#) and other privacy laws have created a line of defense for the protection of sensitive data, AI teams have found it difficult to assess data provenance and whether datasets have adhered to privacy rules or not. Zero Knowledge can be a useful privacy layer to help preserve some data, while allowing AI to still learn from it.

It's safe to say that we, like many in the industry, are very excited about [Zero Knowledge tech](#), a vision that, when fully realized, represents an 'endgame for Web3'.

Where nearly any use case can leverage blockchains without concerns to scalability or privacy.

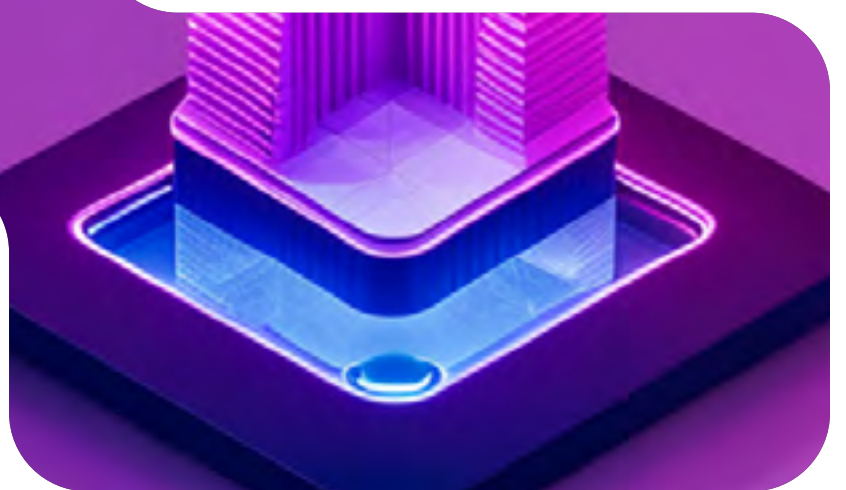
It's why we've been running a [Zero Knowledge focused accelerator program](#), to help foster the next generation of projects helping provide a more secure digital space for all participants.

However, most importantly, it will fundamentally shift Web3 from 'public by default' to 'private by design,' enabling a form of selective disclosure where a user can prove something is true without revealing the underlying data as evidence through digital proofs and attestations.



What could tokenized generative AI tools look like?

CLICK TO READ



UKRAINE; A BATTLEFIELD FOR THE NETWORKED STATE



The first hot land war since WW2 on the European Continent has shocked the world, but few technophiles can fail to be fascinated with how it is being fought: in an expanded ‘cyberwarfare’ context.

Ukraine has become the first state to battletest crypto, and to stand up a state capture resistant economy, from mobiles to low orbit satellite hardware like Starlink.

Russia and its citizens have sought to use the same infrastructure to counter subsequent de-economization by the US through sanctions. We must remember, for better or for worse, The Open Metaverse is neutral to the politics of nation states, and therefore will likely be problematic for some constituencies dependent upon the state of global affairs.

Both countries have raised considerable amounts of funds using decentralized technology. Ukraine alone has to date raised more than **\$200 million in funding** to help the war effort. Russia meanwhile, has also used the technology to raise more than \$80 million according to **crypto auditing firm Certik**.

This has caught the attention of other states, such as Taiwan, which, inspired by Ukraine, is now **actively building Web3 infrastructure** to combat aggression from China. In Hong Kong, too, protestors have embraced decentralized technologies to organize and share information, away from state surveillance.

These examples are ushering in what Balaji Srinivasan calls **“The Network State”**, the successor to the “Nation State.” A Network State is a “social network with an agreed-upon leader, an integrated cryptocurrency, a definite purpose, a sense of national consciousness, and a plan to crowdfund territory.” The examples above show how cryptocurrencies and Web3 technologies are becoming tools in broader geo-political battles. But more broadly, they show the possibilities that Web3 technology has for creating decentralized institutions.

These examples are providing real world use cases for why state and non-state actors should take an increasing interest in censorship-resistant technologies, while simultaneously raising awareness among new generations of developers about its potential in an increasingly dictatorial and statist global environment.

REFI; A TRUER FORM OF FINANCIAL INCLUSION



It could be argued that much of DeFi has been limited to replicating – albeit bottom up – Wall Street and all its excesses, just in a permissionless environment.

However, we truly believe that the power of The Open Metaverse is in [what we termed back in late 2021] ‘MetaFi’: a form of financial inclusion of value in the digital economy today.

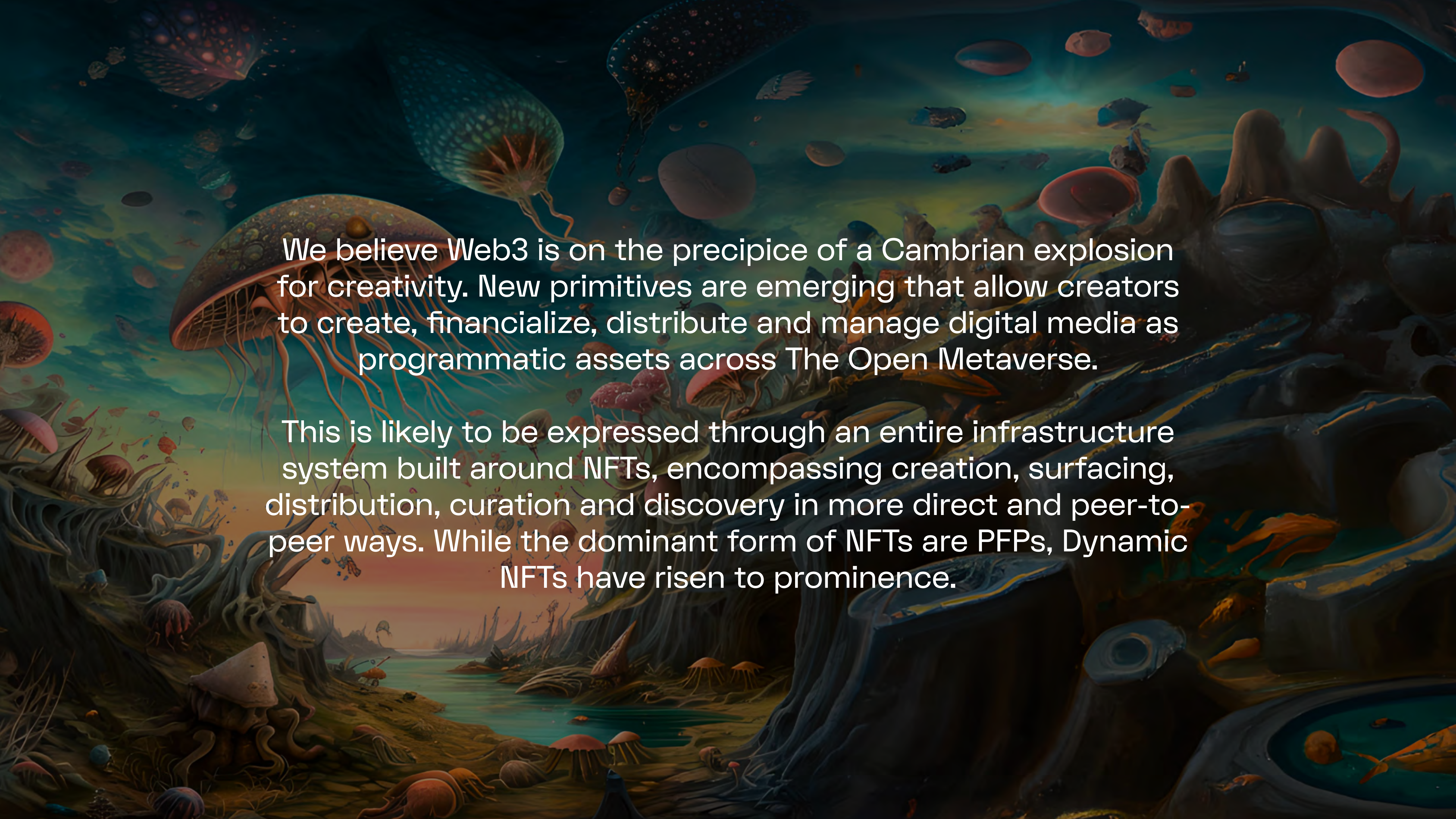
This includes anything from in-game assets to reputation and attention in the Creator Economy, all which could be used as collateral in DeFi. This tokenization of value has already begun but is now more widely referred to as ReFi or regenerative finance, creating positive environmental, social, and economic impacts over past and present implementations of DeFi which are largely zero sum games.

Furthermore, we expect ‘Digital Co-operatism’, leveraging innovations from a now maturing DAO Stack (a fascination of ours since as far back as 2014) to allow for a form of collective banking and mutualization of assets, and wealth, but also risk through insurance.

Especially as banks and the existing financial system continue to debank users of crypto on a regular basis. We must take control over our own economic sovereignty.

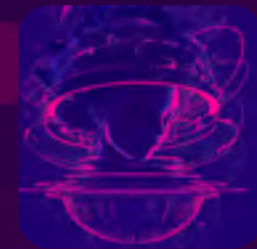
However, at the heart of this are Web3 experiences that are essentially mobile-first. [Celo](#) was one of the first protocols to focus on mobile from an accessibility and inclusion perspective in order to reach the next billion people who access the web via a smartphone. However, one of the limiting factors for native Web3 mobile experiences has been Apple’s gatekeeping with prohibitively high fees on any in-app transactions (**at 30%**) and banning linking to off-app transactions; something that has even been **challenged by Epic Games** in a California court.

Equally, early implementations of play-to-earn such as [Axie Infinity](#) showed the potential of digital work blurring with play, but the tokenomics proved too volatile, too speculative and bull market dependent. Whilst there are newer implementations such as play-and-earn, MetaFi’s potential has still not been realized at scale.



We believe Web3 is on the precipice of a Cambrian explosion for creativity. New primitives are emerging that allow creators to create, financialize, distribute and manage digital media as programmatic assets across The Open Metaverse.

This is likely to be expressed through an entire infrastructure system built around NFTs, encompassing creation, surfacing, distribution, curation and discovery in more direct and peer-to-peer ways. While the dominant form of NFTs are PFPs, Dynamic NFTs have risen to prominence.



Can The Open Metaverse Transform Streaming as we Know it?

CLICK TO READ

DYNAMIC NFTS & CREATOR ROYALTIES GUARANTEES

Dynamic NFTs can change based on external conditions. Also known as a “living NFT,” the token has characteristics that can be triggered to change due to an event or achievement. For example, if you are a gamer, your NFT avatar can be programmed to change its appearance depending on your advancement in the game.

In addition to enhanced value capture on the creator’s side, consumers are rewarded with deeper ownership, engagement, entertainment and potential earning opportunities by virtue of their participation. The ability of users to interact and organize around a particular intellectual property with the appropriate infrastructure for coordination and cultural production unlocks a new value that was not present in the social graphs of Web2, namely community and co-creation. These activities can include governance, communication, games and social interaction.

In light of the increasing complexity of on-chain cultural production, technical and legal considerations to enforce cross-platform rights management will be critical to the success of The Open Metaverse.

As marketplaces move away from honoring royalties, it’s become clear that previous rules around IP are in a state of flux, meaning creators and marketplaces will need to work together to work out what happens next.

One such outcome of this collaboration is already starting to bear fruit. Magic Eden, the leading NFT marketplace on Solana, introduced the Open Creator Protocol (OCP) in [December 2022](#), which allowed creators of new NFT collections to block marketplaces that refuse to honor royalties.

One feature inside OCP that is of particular interest is its dynamic royalty option. This feature introduces a linear price curve to cut down the total fee paid by buyers for higher-priced NFTs, potentially making royalties appear less daunting for pricey purchases.

Similarly, the new [ERC-721C](#) standard is blocking markets like OpenSea and Blur from denying royalties to creators. These changes reveal the evolving battle between creators and marketplaces over who owns NFTs.



IN SUMMARY

This section has explored the opportunities and innovations within The Open Metaverse. While the previous sections focused on the threats and challenges, there are promising advancements in technology and regulations that can drive the growth of The Open Metaverse. The development of primitives in The Open Metaverse goes beyond Web3 and holds potential in areas like artificial intelligence, generative AI, agent-based systems, and the trust layer for its economy.

Zero Knowledge Proofs (ZKPs) play a crucial role in The Open Metaverse. They address scalability and privacy concerns, allowing selective disclosure without revealing underlying data. Moreover, ZKPs serve as a privacy layer for AI, enabling researchers to train models while preserving data privacy and integrity, thus supporting AI's growth.

Additionally, the concept of "MetaFi" emerges, which focuses on financial inclusion and regenerative finance within The Open Metaverse.

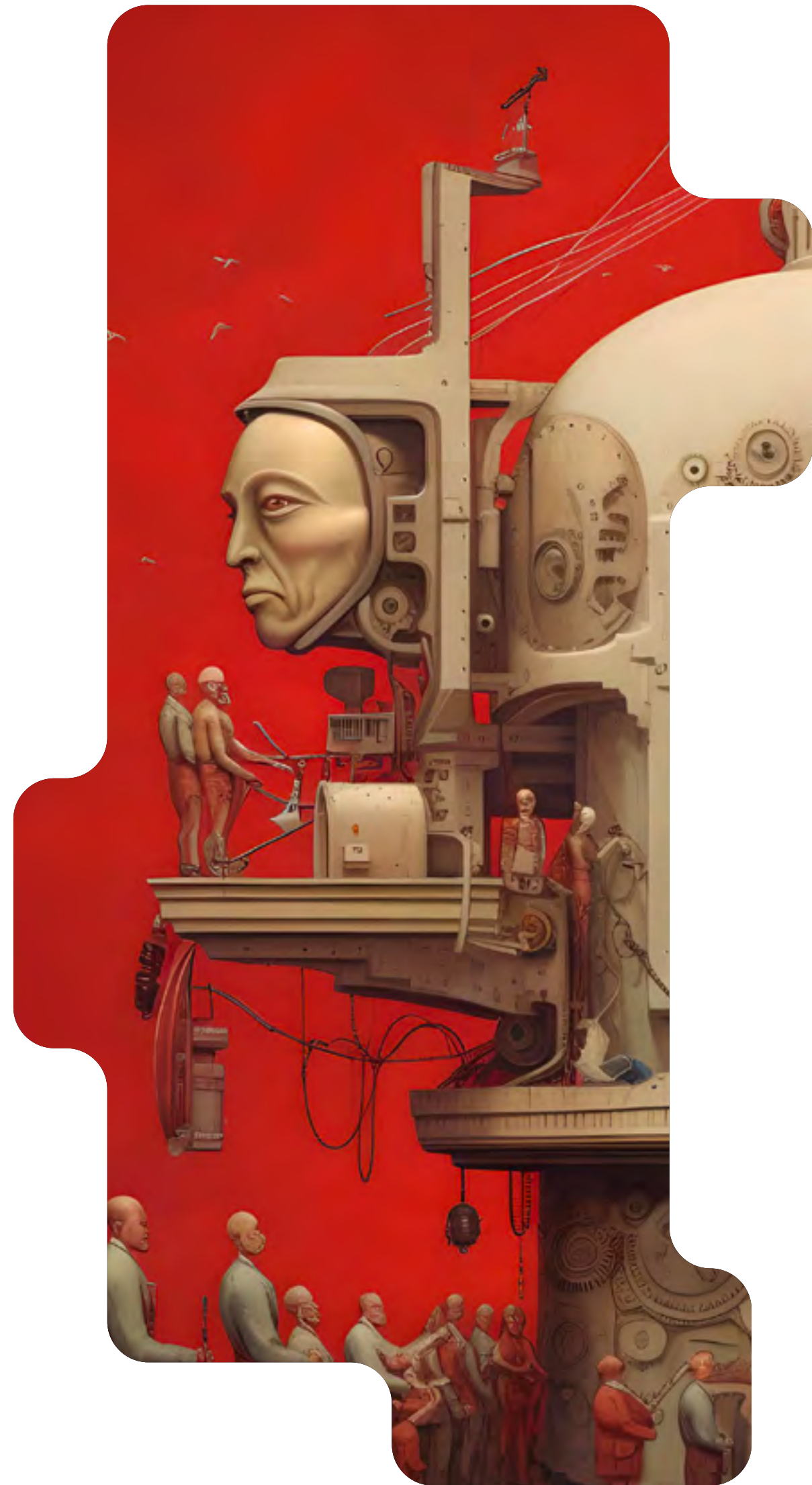
It goes beyond replicating Wall Street's excesses by tokenizing various forms of value, promoting digital cooperativism, and prioritizing mobile-first experiences. Examples of countries like Ukraine and Russia embracing decentralized technologies illustrate the potential of Web3 in geopolitical battles and the creation of decentralized institutions.

Creatively, The Open Metaverse offers creators the opportunity to manage and monetize their digital media through NFTs. In the next section, we will be discussing the opportunities which the aforementioned Web3 technologies can bring for realizing a truly Open Metaverse.

05

CONCLUSION:
THE WAY FORWARD





We explore a way forward, while inviting you, the reader, to take part in shaping the direction of this set of ideas

In the concluding section of this thesis, we will share what we believe are some of the pathways The Open Metaverse might proceed in the coming months and years.

From blockchain's use as a "trust machine" in response to the explosion of AI to the role decentralized identities might play in the evolution of Web3, we contend that The Open Metaverse offers both a genuine alternative to the centralized authority and gatekeeping found in the Web2 world as well as new possibilities.

However, without the continued efforts of creators, builders and projects to this movement, the digital landscape is likely to become further stratified and segregated; controlled by increasingly powerful players with the ability to stifle competition and innovation.



POSSIBLE PATHS FORWARD

A big part of this is related to the convergence of technologies; in particular blockchains, tokens (fungible and non-fungible) Zero Knowledge Tech and Web3. [The convergence thesis](#) is a theme that has been at the heart of our DNA since early 2017. In fact, we believe that AI, far from distracting from the mission of Web3, will ultimately be a key driver for its adoption and success. In effect, all roads lead to Web3.

This convergence will lead to a dizzying acceleration of innovation, both industry transformation and disruption, as technological gains compound and reinforce one another in ways that will be difficult to keep up with. Especially for regulators.

EXTENDING THE BENEFIT OF COMPOSABILITY



Composable Creativity:
The Future of AI

CLICK TO READ

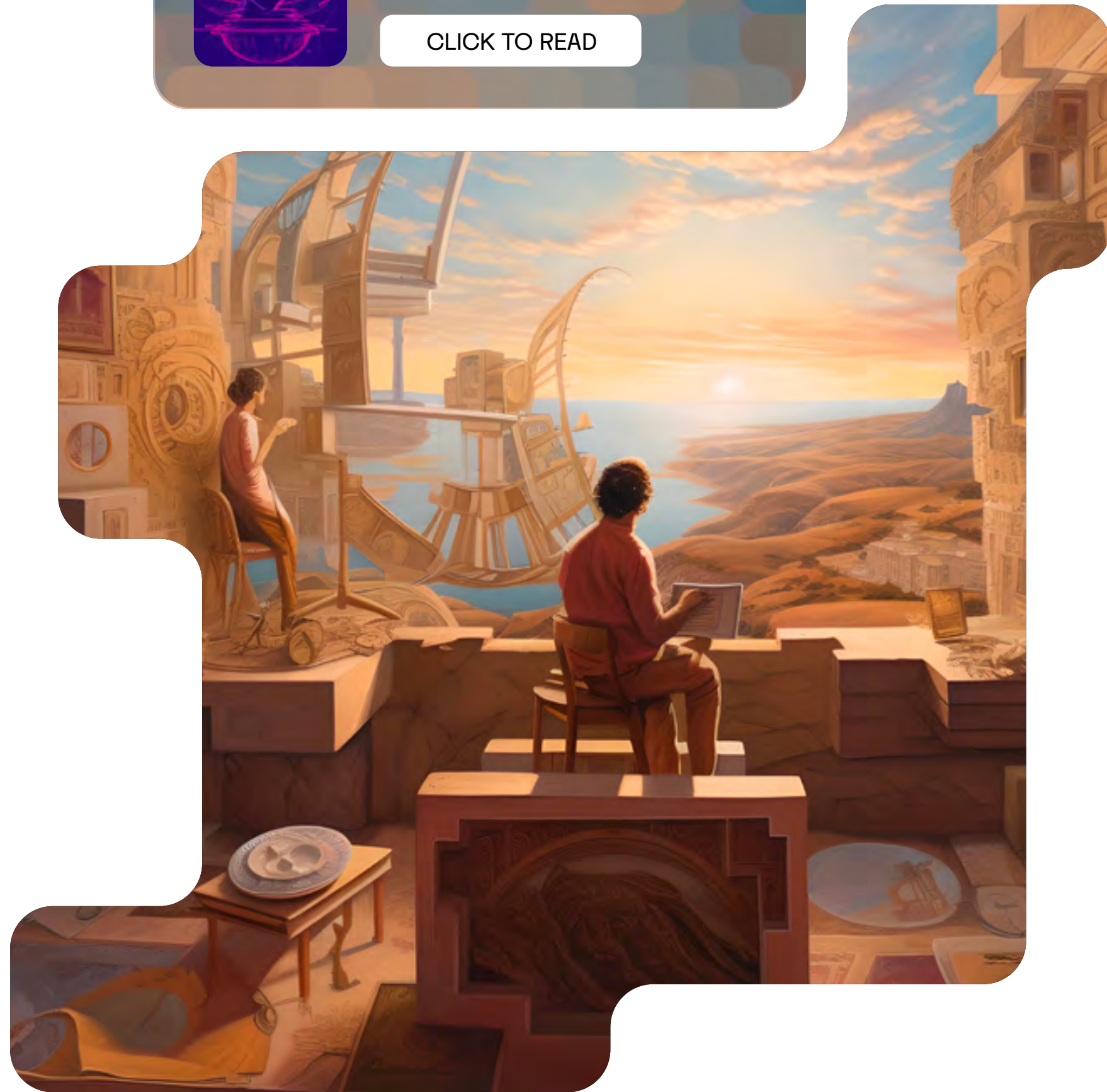
We are seeing huge potential in extending the composability of Web3 beyond DeFi to more use cases and industries. An example being the potential for a universal library of assets where every element of a game or movie can be recombined as a form of [‘Composable Creativity’](#); where each asset is available for reuse based on clearly defined parameters, with baked-in perpetual royalties including on derivative works.

In our own portfolio, we see the beginnings of this possibility with [Crucible](#) (cross-game engine assets like NFTs) and [Fragnova](#), a multiplatform game creation system focusing on full immersion where creators can interact, build, inspect and modify their creations in a no code, visual and AI-assisted way. Creator-controlled smart-contract middleware can help build a paradigm where any asset, including 3D objects built in game engines, to NPCs (Non Player Characters) and even prompts (for generating new assets through generative AI) become composable at the atomic level, with built-in perpetual royalties.

The impact of these innovations could be huge, especially when considering the average AAA game or blockbuster movie takes between \$65 and \$80 million, hundreds to thousands of people and three years to produce.

By reducing the time and cost of producing high-end content, while offsetting the cost of creating new assets by making them available for reuse, dramatically improves the production process and the economics of entertainment while leveling the playing field for independent creators. Finally allowing supply of new media to meet its insatiable demand.

A further example of convergence is [composable creativity](#) allowing for the possibility of remixing or “spawning” cultural capital at an almost infinite rate. This not only opens the doors to new forms of cultural production, user-generated content and media, but also raises a problem of consent, as today’s training data does not respect the sovereignty of creators.



DECENTRALIZED IDENTITY & THE WEB3 SOCIAL GRAPH



Decades of innovation in DID (Decentralized Identifiers) and VCs (Verifiable Credentials), both bottom up and within the W3C (World Wide Web Consortium), have worked towards universal identity standards and protocols.

A point of friction has come from a lack of clear financial incentives and business models to stand this up beyond a public good. Tokenization allows for the monetization of the costly exercise of identifying people to be offset, and in many cases a source of revenue as attestations become reused by new verifiers. This is why we invested in [Cheqd.io](#), a secure network that enables individuals and organizations to fully control their personal data.

This inevitability will happen, the question is when?

[Vitalik Buterin suggested Soulbound NFTs](#), non-transferable NFTs, could be forms of public credentials that represent a person in a certain context. Continuing this line of thinking at Outlier, we have always seen PFP NFTs as a form of atomised social media and belonging without the platform.

In The Open Metaverse, the social media model will be inverted compared to Web2. Social graphs will not be limited to platforms, or across platforms owned by the same conglomerate, but rather will be universal open protocols where the app or platform, or 'verse' will be

more similar to web explorer (which allow you to socialize and express identity in a context specific environment.) With Web3 innovations like [Lens Protocol](#), this is technically possible to do in a decentralized way.

This is as of yet a clear winning protocol for this purpose, but we expect it will consist of a combination of public namespaces, on-chain attestations (such as NFTs and Soulbound Tokens) but also off-chain proofs, with private elements of identity using Zero Knowledge technologies.

Ultimately, this could allow for a separation of identity into public and private spheres, connected using Zero Knowledge technology that would allow for financial and personal information to be connected but compartmentalized.

All this will break, or at least reinvent, the advertising model which current web platforms rely on, and the ubiquitous user cookie tracking it requires. In a fully immersive metaverse context, it will mean that we can make ourselves instantly recognizable but in a highly permissioned way, to others as we navigate the physical and virtual worlds, through augmented experiences and layering, once hardware catches up.

D-COMMERCE & CONNECTING REAL WORLD ASSETS



Linked to our section on ReFi, the Holy Grail is to fully realize the vision of the metaverse and seamlessly connect up the virtual and physical worlds. This means finding a way to get real world assets and events into DeFi, and smart contract workflows, in a regulatory-compliant way.

Whilst this vision has had many stalled attempts, in particular STO (Security Token Offerings), there seems to now be real traction gaining from some of the worlds largest asset managers like Blackrock. Blackrock have [publicly hailed tokenisation](#) as “the next generation for markets and securities”. Similarly, Goldman Sachs has begun to [offer its customers tokenisation options](#). Examples like these illustrate that despite the brouhaha around crypto, many institutional players see the promise offered by its core underlying technology.

The long-term goal should be to have Web3 not be a parallel system, but rather fully integrated into the existing financial system and harmonized with the various regulatory regimes.

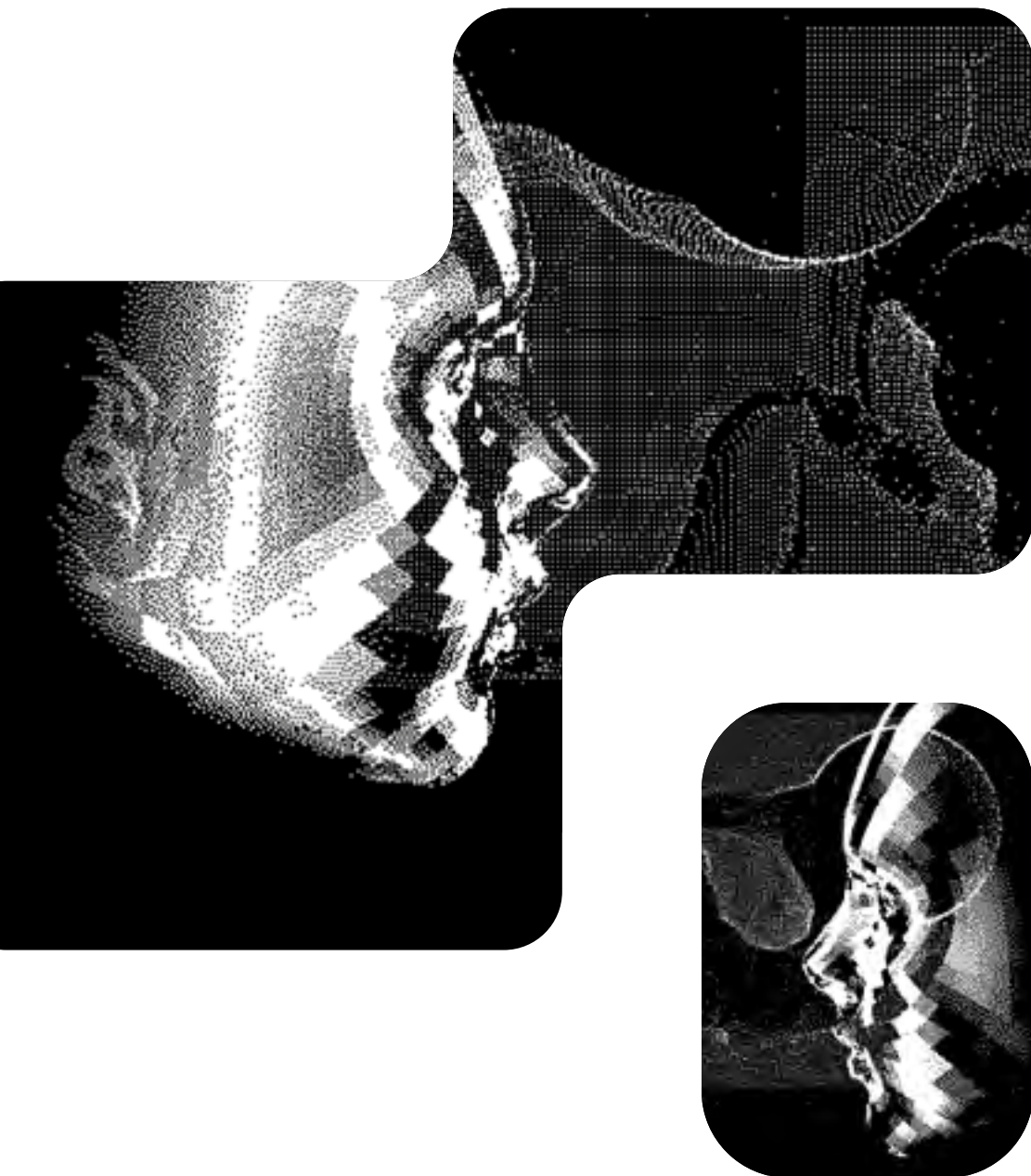
For example, like with another Outlier portfolio company [DIA Data](#), having oracles that meet regulatory standards to feed into regulated financial products such as indices.

We expect this innovation to first happen in smaller more agile jurisdictions that must innovate to compete, grow or maintain their capital markets and financial services industry; these include Dubai, Singapore or Cayman ([Tech Cayman](#) being an investor and partner in Outlier Ventures) but also the UK which is looking to redefine its role in the global economy, to then be retrofitted into larger jurisdictions once proven to be successful.

It also requires us to reimagine what ecommerce and its supply chains looks like in a Web3 context, something we call dCommerce, and how we can build a decentralized composable stack of open source protocols and services which could replicate the entirety of eCommerce today from integrating with Shopify web stores to inventory systems, CRM and dynamic pricing all the way to last mile fulfilment.

[Boson Protocol](#), an early investment of Outlier Ventures, has seeded the dCommerce stack with some of its cornerstone primates around digital to physical redemption and dispute resolution. We hope to see much more innovation coming through in this domain, and will be running a dedicated dCommerce program this year.

BEYOND GENERATIVE AI, TOWARDS AGENT BASED SYSTEMS & AEAS



LLMs (Large Language Models) the technology behind AI tools like ChatGPT promise to shift The Web from a command and search-based experience to something more conversational. First, as a digital experience (still using our digits to type) but eventually to a voice based, natural language interface. This reinvents search, online advertising and ecommerce and makes the web a much easier and more intuitive experience.

However, if AI stops at the recommendation without being able to complete the resulting actions, it remains limited. In effect, AI without agency significantly limits its potential. That's why **agent based systems** are being hyped as the next big thing. As in where AI can not just instruct but act, with varying degrees of autonomy and in particular economic agency.

However, most nascent agent based systems exist today in a monolithic Web2 design, operating on and owned by a single platform.

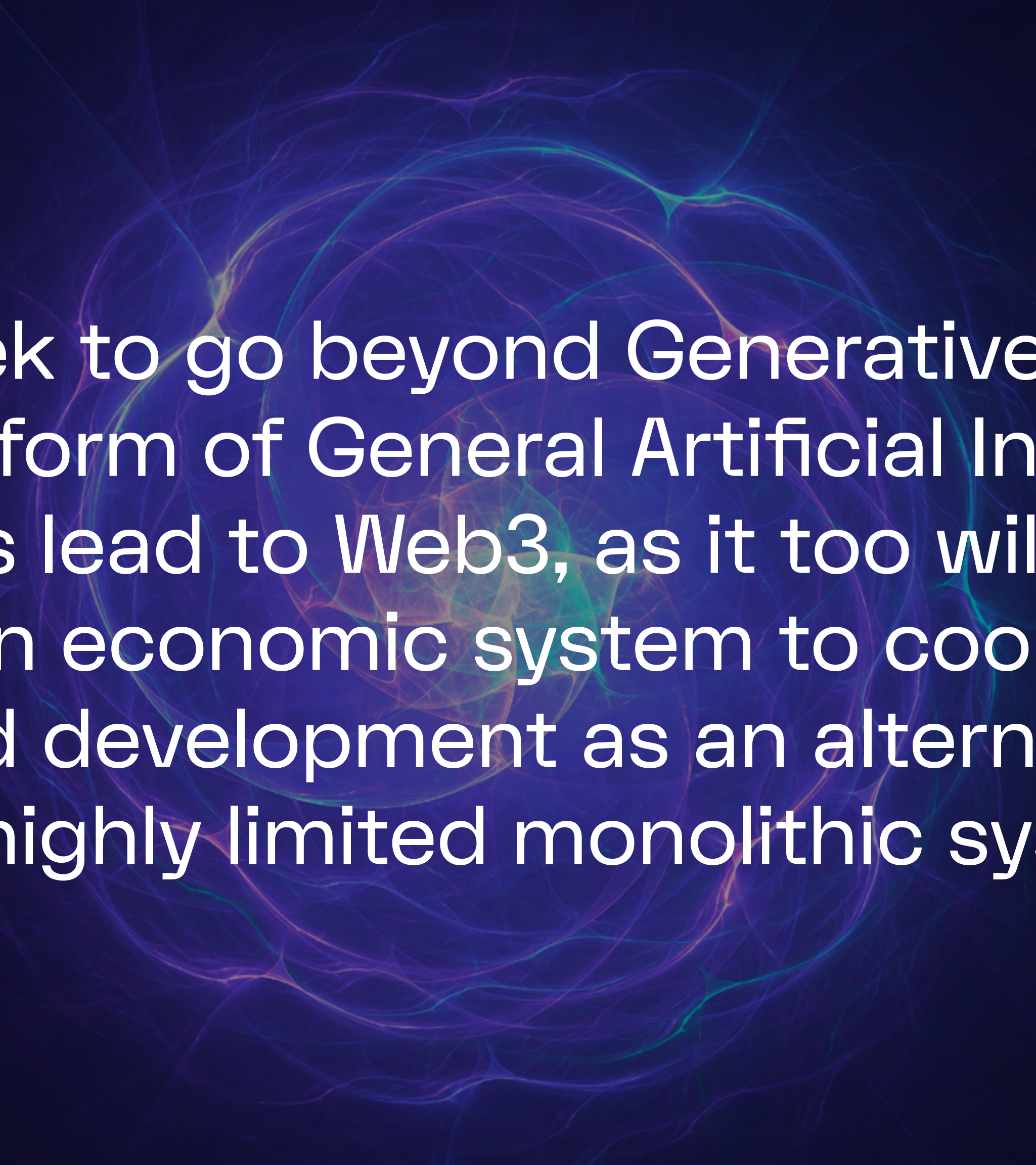
But to be able to act across any conceivable range of queries, it would either need one company to achieve AGI (Artificial General Intelligence) something even Open AI don't see as possible any time soon, or it would need billions, perhaps trillions, of stakeholders to be integrated to deliver specialist agent based services.

Yet the vision for AEAs (autonomous economic agents) as smart contracts is as old as Ethereum itself and has been developed further over the last several years by Outlier portfolio company [Fetch.ai](#) an open source protocol where truly smart contracts, albeit in a narrow sense, can carry out specialized tasks.

We believe, in aggregate, that this kind of approach is the only conceivable short to mid-term way we can achieve AGI, by agents subcontracting out tasks to other specialist agents through on-chain micro-transactions, which could at least deliver the feeling of AGI (Artificial General Intelligence).

Furthermore, agent based systems also raise questions about sovereignty. How can I trust that an agent is serving my own interests and not that of a third party or platform which requires the auditability promised by smart contracts and blockchains.

In fact, for us it is also inconceivable that users could fully use an agent based system without a Sovereign Agent to negotiate and probably look out for our interests. In fact, the more users can trust a system the more work they will devolve to it and data they will be prepared to share with it to personalize their experience; this will ultimately make the AI models and system as a whole smarter.

A glowing brain graphic with purple and blue neural connections, serving as a background for the text.

As we seek to go beyond Generative AI and to achieve a form of General Artificial Intelligence, all roads lead to Web3, as it too will need a more open economic system to coordinate its distributed development as an alternative to its initial highly limited monolithic systems.

A CALL TO ACTION

While we have tried to provide an overview of the state of the Web3, and The Open Metaverse that it can enable, perhaps the most important point to make in this thesis is that none of this is set in stone.

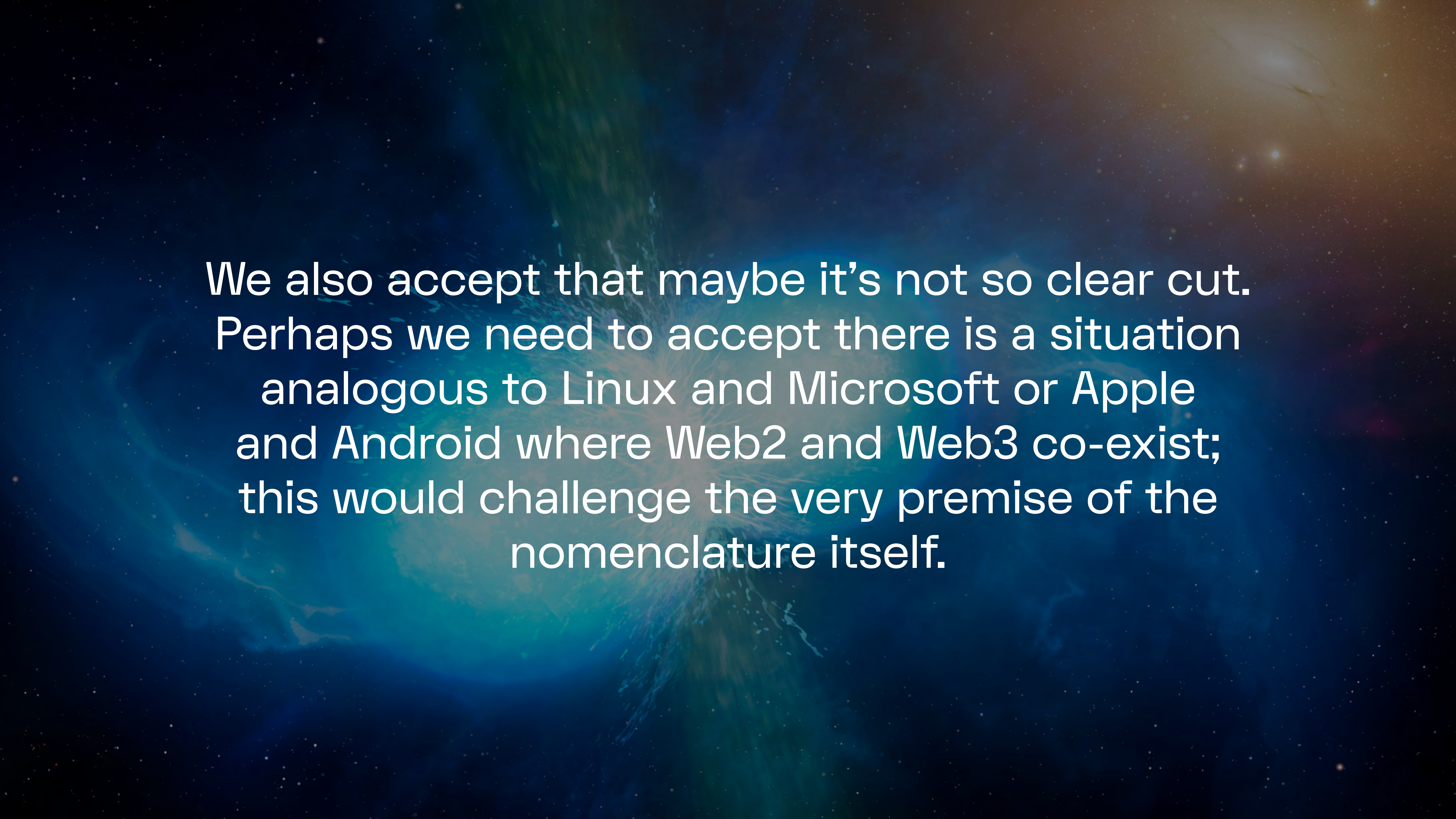
We all must continue to walk the fine line between making Web3 accessible and usable. Building products that don't just compete purely on the philosophy of decentralization and user sovereignty, but that are 10x better than incumbents and/or allow entirely new functionality and benefits.

Ultimately, it is the founders and their daily decisions that will forge this pathway, develop solutions to counter many of the challenges outlined in this thesis, or make technical or business model decisions that reinforce them. And this is where we are most hopeful.

As the world's leading Web3 accelerator we can objectively say the volume of founders building in this paradigm is growing month-on-month. The quality we are seeing is also improving with serial founders with exits under their belts to a wave of experienced execs pouring out of Big Tech. However, each brings their own biases that will compete in this marketplace of products, not ideas or philosophies.

The reality is those founders that are succeeding, like [Timmu Toke](#), founder of Ready Player Me are pragmatists. His stated product strategy is to 'build a product 10 people will like, then 100, a 1,000 and then a million, and only then worry about decentralization and tokenization'. He sees those as a means to accelerate developer adoption, and interoperability, not because of a philosophy but because it genuinely catalyzes networks.

Whilst this brings risks such as the potential of early acquisition or a perpetual Web2.5, if we are truly confident in Web3's potential to deliver better outcomes for users, we should trust its ultimate benefits should win out. And specifically when it comes to tokenization, that means in both bull and bear markets. This requires us all to be objective, and be open to being sometimes wrong, and learning from collective failings



We also accept that maybe it's not so clear cut. Perhaps we need to accept there is a situation analogous to Linux and Microsoft or Apple and Android where Web2 and Web3 co-exist; this would challenge the very premise of the nomenclature itself.

That being said, at Outlier we strongly believe we must fight for the choice of users to freely opt out of a platform and exercise their digital property rights in the same ways that governments have forced retail banks to allow for easy switching.

As long as this option exists, we can focus on competing on better products and better experiences, whilst avoiding the now infamous Web2 moats that restrict and limit users leaving at all costs.

Some will say this process of bundling and unbundling of platforms is inherent to information technologies (as has been made in the brilliant book [Master Switch](#)) from the radio to cable and now the various iterations of The Web.

And whilst that may have been true the stakes are getting higher as we shift from the communication of information and a social web towards an entirely all consuming economic system, into which more and more people are migrating their wealth. And it is not that anyone in Web3 is opposed to platforms being successful, it is just the nature of their relationship with the user.

It is no longer just about the sovereignty of information or identity, or even the right to free

speech. It is about the sovereignty of your digital personhood, wealth and the ability to freely participate in the economy that is the metaverse.

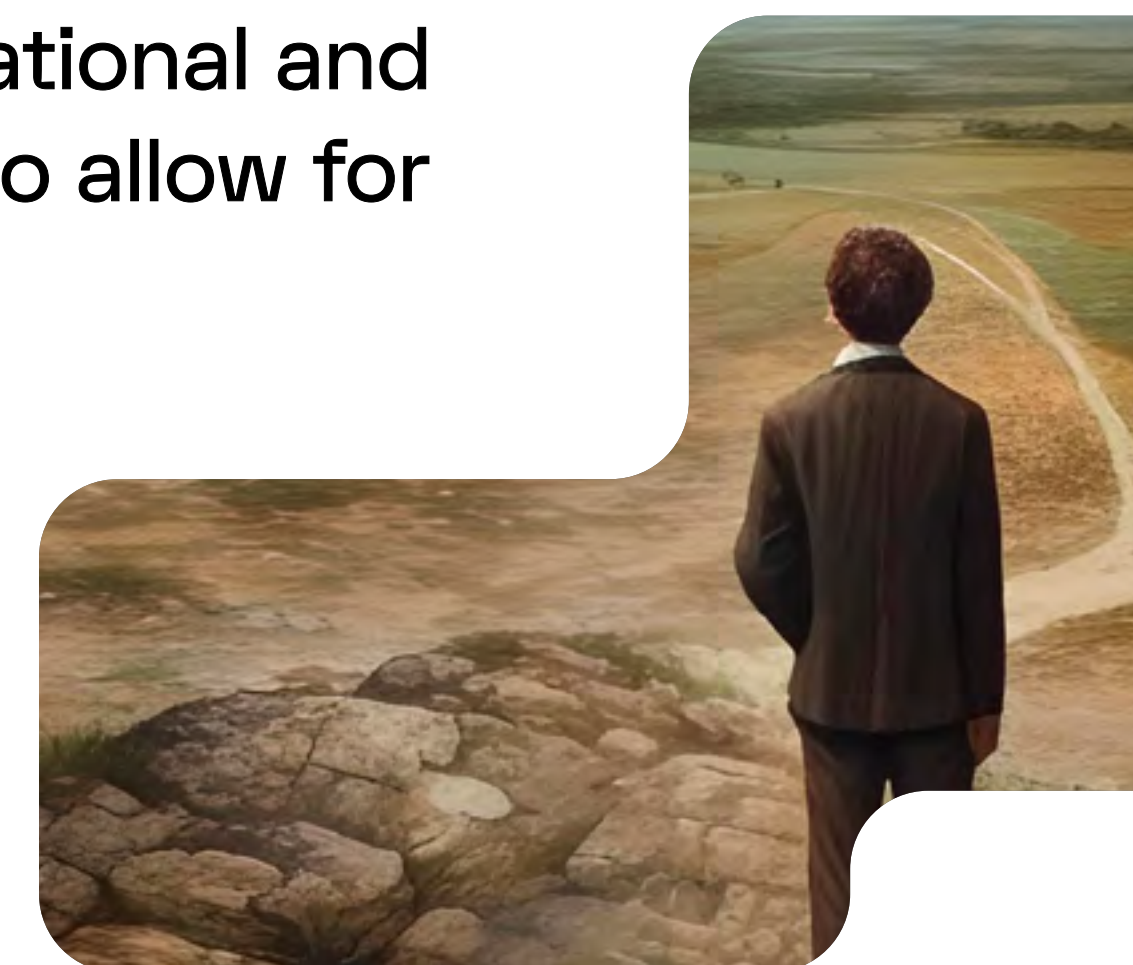
We believe that governments will need to choose between, what in their eyes they may for now see as, the better of two evils. Big Tech that is anti-social, anti-competitive and extractive but that can be co-opted or a new open economic system that can unleash greater innovation and global GDP growth, whilst enhancing user rights, but which might undermine the status quo of the current financial system, and ability for the state to control and coerce citizens.

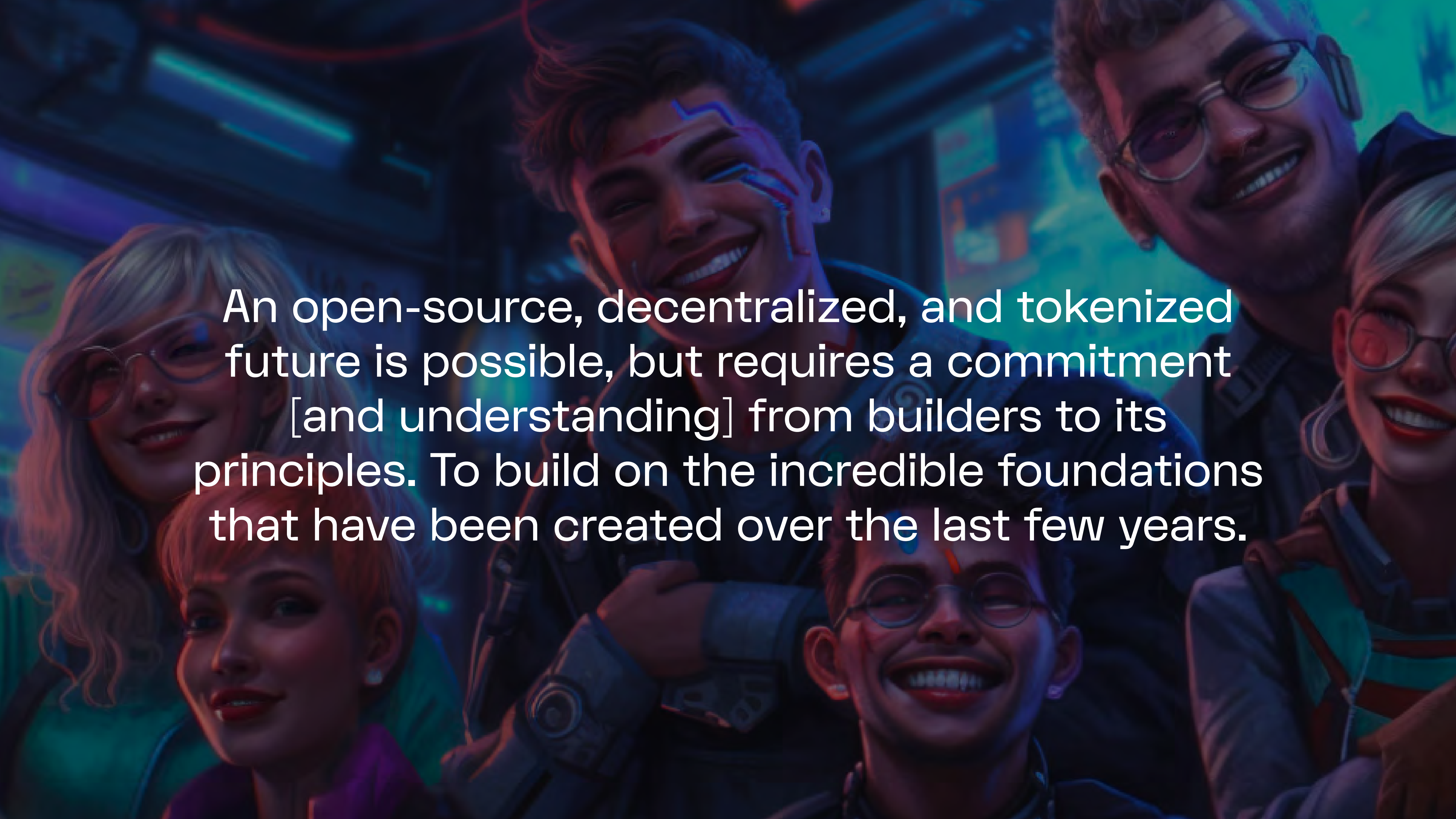
So whilst we focus on enabling founders to navigate the complexities of Web3 as an accelerator, we don't believe it is enough to just build technologies.

In short, things have got political, and in the case of the US maybe even partisan. So we must mobilize as an industry to educate policy makers, combat malpractice in our industry, and support the principled founders who can walk the line to build great Web3 products people want within today's technical limitations and trade-offs.



We must build a narrative to tie digital property rights to fundamental and recognized human rights at a national and supranational level to allow for their defense.



A group of diverse, smiling people in a futuristic, neon-lit environment. The scene is filled with vibrant blue and purple light, suggesting a high-tech or digital setting. The individuals are dressed in modern, casual attire, and their expressions are joyful and engaged. The background features blurred architectural elements and glowing lines, creating a sense of depth and movement.

An open-source, decentralized, and tokenized future is possible, but requires a commitment [and understanding] from builders to its principles. To build on the incredible foundations that have been created over the last few years.

HELP BUILD A MORE OPEN METAVERSE

Learn more about our Base Camp
Accelerator Programs

[Apply Now](#)

Outlier Ventures



THE OPEN METAVERSE
UNDER ATTACK; ☒☒♥
THE FIGHT BACK

DISCLAIMER

The information provided during this thesis, along with other material presented today or shared afterwards, and the accompanying oral thesis related to each material (collectively, "this thesis"), has been prepared, published and distributed by Outlier Ventures Operations Limited, a company registered in England and Wales, under company registration number 10722638 (the "Company").

Information and opinions provided in this thesis have been obtained or derived from sources believed by the Company to be reliable, but the Company makes no representations as to their accuracy or completeness. The Company accepts no liability for any loss, (whether direct or indirect) arising from the use of the material presented in this thesis.

Any forecasts, opinions, estimates and projections contained in this thesis are provided for illustrative purposes only. Such forecasts, opinions, estimates and projections involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by such forecasts, opinions, estimates and projections. Recipients of this thesis must determine for themselves the reliance (if any) that they should place on such forecasts,

opinions, estimates and projections. Past performance should not be considered as an indication or guarantee of future performance, and no representation or warranty, express or implied, is made regarding future performance. Information, opinions and estimates contained in this thesis are subject to change without notice. Please note that the information provided to you might vary due to the changing market conditions and new risks that may emerge from time to time.

The Company disclaims any liabilities for losses you may suffer due to your reliance on the information provided during this thesis. This thesis also may contain estimates and other statistical data made by third parties and by the Company relating to market size and growth and other industry data. These data involve a number of assumptions and limitations, and you are cautioned not to give undue weight to such estimates. The Company has not independently verified the statistical and other industry data generated by third parties and contained in this thesis.

This thesis also contains estimated preliminary financial information which is based upon information available to the Company as of the date of this thesis and has not been audited or reviewed by the Company's independent

registered public accounting firm. The actual results may differ materially from this preliminary data. This thesis shall not constitute an offer or a recommendation by the Company or any of its directors, officers, employees, agents or advisers in connection with any purchase of or subscription for securities or otherwise. This thesis may contain material that is not directed to, or intended for distribution to or use by, any person or entity who is a citizen or resident of or located in any locality, state, country or other jurisdiction where such distribution, publication, availability or use would be contrary to law or regulation or which would subject the Company to any registration or licensing requirement within such jurisdiction.

The information contained in this thesis has been prepared for informational purposes only. Recipients should not construe the contents of this thesis as legal, tax, regulatory, financial, investment, trading or accounting advice or services and are urged to consult with their own advisers in relation to such matters. The Company accepts no liability for any loss arising from the use of the content of this thesis.