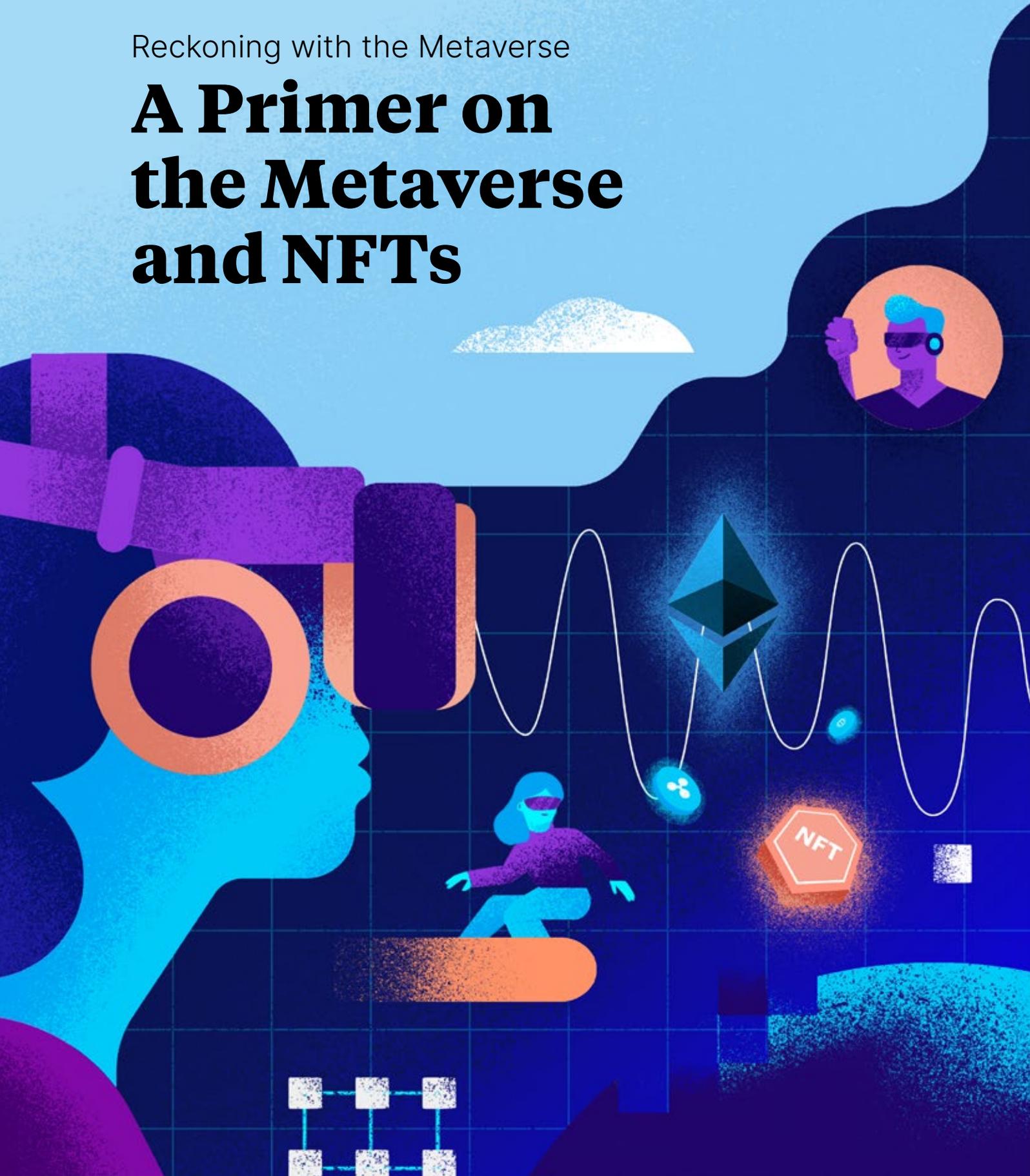


Reckoning with the Metaverse

A Primer on the Metaverse and NFTs



Introduction

Policymakers and executives must focus on the metaverse if they are not already doing so. Many “Metazens” are already spending significant time and money in virtual environments on things like gaming, virtual real estate, and non-fungible tokens, or NFTs.¹ As the metaverse becomes a bigger part of people’s lives and livelihoods, financial and other activities will need a solid basis in law and regulation. Such a basis does not yet exist.

The metaverse has the potential to become a constellation of realistic and alternative worlds where, as in the physical world, individuals and institutions can purchase and sell all types of goods and services. It makes use of innovations in money: transactions are made with digital assets and some of the goods sold are packaged as non-fungible tokens. NFTs will play an important role in forming the building blocks of property in the metaverse, and both sectors are already growing rapidly.² Some of the projections for the size of the metaverse market are eye-opening, ranging widely from \$670 billion to \$13 trillion.³ While the growth potential remains an open question, the market is too big for regulators to ignore.

In this paper, we seek to provide an overview of the metaverse and how NFTs will play a role in shaping it, covering topics such as:

- Basics of the metaverse
- Ins and outs of metaverse use
- Importance of the metaverse
- Virtual property rights considerations

Basics of the metaverse

Q: What is the metaverse?

The metaverse employs new technology to bridge gaps between the physical and virtual worlds, allowing colleagues to work together, students to learn together, and friends to socialize together in a more realistic, natural way than the current internet offers (see Exhibit 1). Today’s metaverse contains humanoid avatars meeting in a multitude of different virtual reality environments. The most significant use case is gaming, with games like Fortnite enjoying three to eight million daily users.⁴ The metaverse of tomorrow may span many more use cases, driven by easy connections between digital worlds (portability) and the integration of digital and physical worlds through the use of augmented reality (AR), virtual reality (VR), and the internet of things (IoT).

The term “metaverse” was coined by science fiction writer Neal Stephenson in his 1992 novel “Snow Crash.” It portrays a dystopian world in which users’ avatars are proxies for their social status and wealth, and a subset of users become addicted to the metaverse and effectively abandon the physical world for virtual reality.⁵ The work of fiction points

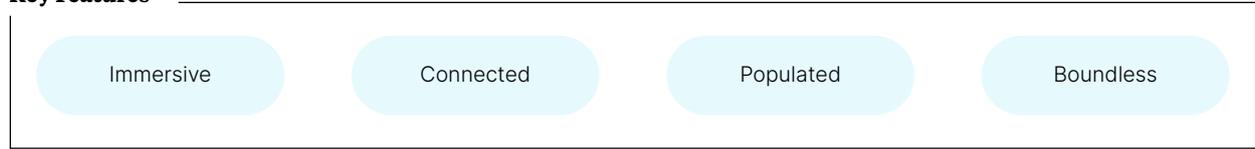
to real risks within the metaverse, and to avoid a dystopian outcome, developers of the metaverse should seek to have the digital world enhance the real lives of those who use it even if it offers an immersive experience.

In contrast, some espouse a more utopian vision for the metaverse, where virtual worlds are seamlessly integrated, with individuals retaining control and autonomy over their digital selves. These optimists imagine virtual worlds built on top of a new iteration of the internet designated “Web3.” While currently more of an idea than a firm reality, developers envision Web3 as the next generation of the internet with a focus on decentralization, open access, and interconnectivity between systems. The name Web3 is meant to distinguish it from Web 2.0, the current version of the internet, in which a few closed and centralized platforms dominate total value.

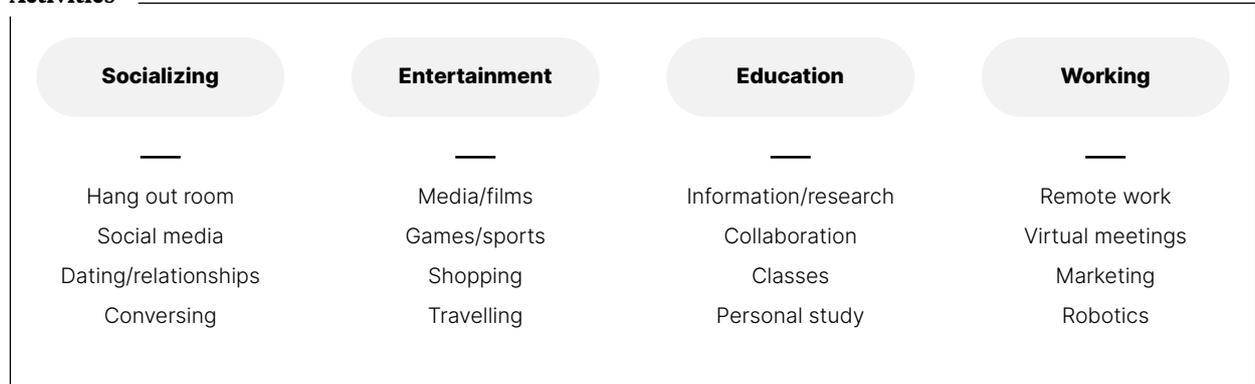
Where the metaverse and Web3 may align to have the greatest impact is in the area of payments. The lack of an embedded payments infrastructure encouraged some business models to rely on excessive advertisement, data collection, and privacy

Exhibit 1: What is the metaverse?

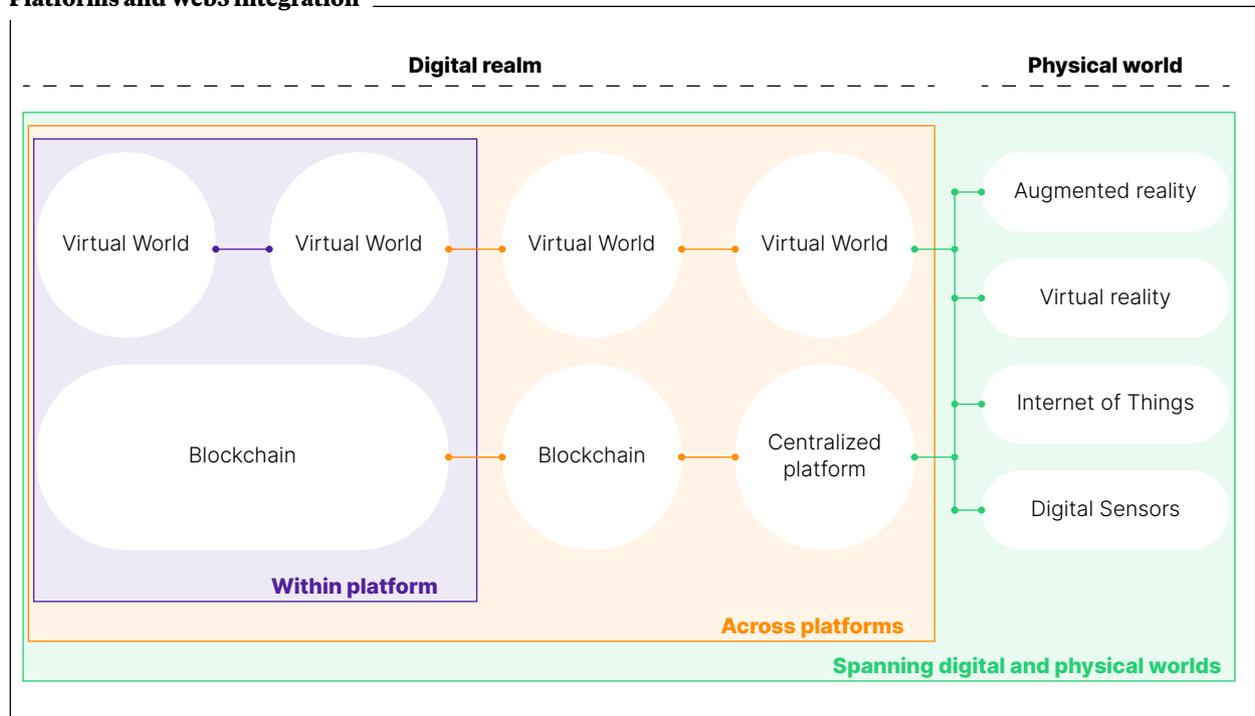
Key Features



Activities



Platforms and Web3 integration



Source: Oliver Wyman Forum

invasion.⁶ A metaverse that includes features like decentralized identity would allow users to control their data while giving businesses confidence in who they are dealing with. That could enable new business models with embedded payments for a superior user experience.

None of this is to say that the advent of Web3 or a metaverse where worlds are open, integrated, and decentralized is a certainty. Achieving integration across virtual worlds and platforms is no easy task. Additionally, dissenting voices have outlined a bearish view of achieving decentralization through Web3 given both the technical complexities of ensuring that different worlds across different platforms can be cheaply and safely connected and the economic realities of the digital world where network effects drive centralization.

There remains an open question if the metaverse model that emerges will be built in a centralized, closed manner or if it will be open and integrated to allow for greater collaboration between worlds. As Exhibit 1 illustrates, the metaverse may grow to be a collection of virtual worlds that are open and integrated, in line with the ethos of Web3. But it's also possible that virtual worlds will be built on centralized platforms, with potential integration to other decentralized worlds. A metaverse built from centralized platforms may not be as revolutionary as a decentralized one. Ultimately, customer demand and technological advances will determine which path of development prevails.

Q: What do NFTs have to do with the metaverse?

NFTs will be relevant only to some virtual worlds in the metaverse. Let's start by first defining what a non-fungible token is.

Non-fungible

A non-fungible item is unique and not interchangeable with another item, like the Mona Lisa. This is the opposite of a fungible item, like dollars or barrels of oil, where a purchaser or seller cares only that item involved in a transaction is one of the right category.

Token

A token, in the crypto meaning of the word, is an asset that exists on a blockchain. Being on a blockchain means that the ownership rights to the token are, in theory, indisputable as the records are available openly on a blockchain which is a public, distributed ledger existing across a network.

Bitcoin is a fungible token; there is no meaningful difference between the single bitcoin owned by Person A or the one owned by Person B. In contrast, NFTs represent a unique token on a blockchain that is different than anyone else's. Whereas Bitcoin can be seen as the blockchain equivalent of money (fungible), NFTs are the blockchain equivalent of art (non-fungible). About 95% of NFTs today are minted and owned on the Ethereum blockchain.⁷ When someone mints an NFT, code is executed that adds the ownership information to the blockchain. The minting occurs through

smart contracts, or computer programs stored on the blockchain that are set to run under certain conditions. They both assign ownership and manage transfers of the NFT.⁸ Further, the ownership right is only as good as the original claim – paying a stranger for the Brooklyn Bridge does not make it yours. Adding complexity, differences in law across jurisdictions could result in multiple “owners.”



This should help point to what types of virtual worlds benefit from NFTs. A closed, centralized platform (like the video game Fortnite) can define its own system of ownership of in-world goods. Representing ownership of in-world goods in an open and verifiable manner, through the use of NFTs, is useful when individuals want to port their goods across worlds, and when virtual worlds are designed to make that easy. Such transferability of in-world goods may be at odds with a centralized platform’s business model or vision.

Outside of the metaverse, NFTs have uses in the tokenization of documents such as property deeds and proof of ownership over goods in cross-border transactions. Within the metaverse, NFTs can be akin to owning a virtual painting.

The use of NFTs is not just limited to art, and the principles behind an NFT can form the foundation of ownership of all property in the metaverse. NFTs could be the vehicle through which digital art, digital real estate, and a digital pair of pants can have a price attached to them along with proof of ownership. This attribute of an NFT, proof of ownership, is what could make it useful in

“There remains an open question if the metaverse will be built in a centralized, closed manner or if it will be open and integrated to allow for greater collaboration between worlds.”



the metaverse, where otherwise it would be difficult to prove that a user has ownership of any property.

Q: How is the metaverse related to cryptocurrencies?

Cryptocurrencies have many uses in the metaverse, but as with NFTs, their usefulness will depend on the extent to which virtual worlds develop along open and integrated lines rather than centralized models. Some emerging virtual worlds make use of their own cryptocurrencies for in-world payments, use NFTs for in-world property, and may have governance tokens that give holders a say in running the system. These virtual worlds are then connected to the rest of the cryptocurrency ecosystem through wallets and exchanges as users move between them.

Not all in-world currencies are cryptocurrencies, though. There are existing virtual worlds built on top of proprietary centralized platforms instead of blockchains, and there's no reason that

entrepreneurs and communities wouldn't continue to experiment with such models even if open, integrated, and decentralized models come to dominate. While users can purchase Decentraland's MANA token on crypto exchanges, Roblox's Robux, which is a proprietary digital currency and not a cryptocurrency, can be obtained on gift cards in physical retailers.



Ins and outs of metaverse use

Q: Who uses the metaverse?

The Oliver Wyman Forum's Global Consumer Sentiment initiative recently published eight behavioral archetypes that will drive future consumer trends. One of these, the "Citizens of the Metaverse" or "Metazens," comprises people willing to participate in the metaverse without hesitation. They represent 13% of the population across the nine surveyed countries.⁹ These consumers are notable for their adoption of Web3, intertwining virtual reality with everyday life without fear of it detracting from their life in the physical world, and investing in purely virtual assets. Metazens see the metaverse as an opportunity to improve people's lives through socializing, working, and gaming possibilities. Metazens also put their money where their mouth is: 70% are willing to pay for access to the metaverse (compared with 24% of the general population) and are significantly more likely than the average person to invest in cryptocurrencies, NFTs, and virtual real estate.

With use cases in areas such as education and work, as shown below, the users of the metaverse will likely expand in coming years beyond the earliest adopters to

include groups such as children and less-technologically inclined, older adults in the workforce as it becomes more mainstream.

Q: How is the metaverse currently used?

The most developed activities in the metaverse today are in the gaming and entertainment industries. Fortnite, Roblox, and Decentraland are just a few metaverse worlds used in gaming and digital exploration. These platforms make use of virtual lands where real world companies can set up shop. For example, JP Morgan established a metaverse office within Decentraland with its February 2022 launch of the Onyx Lounge.¹⁰ Other firms have made similar moves.

While still in its infancy, the potential of the metaverse is being explored and will undoubtedly grow over time. Current use cases include:

Play-to-Earn (P2E)

Players can make money based on the amount of time they spend playing

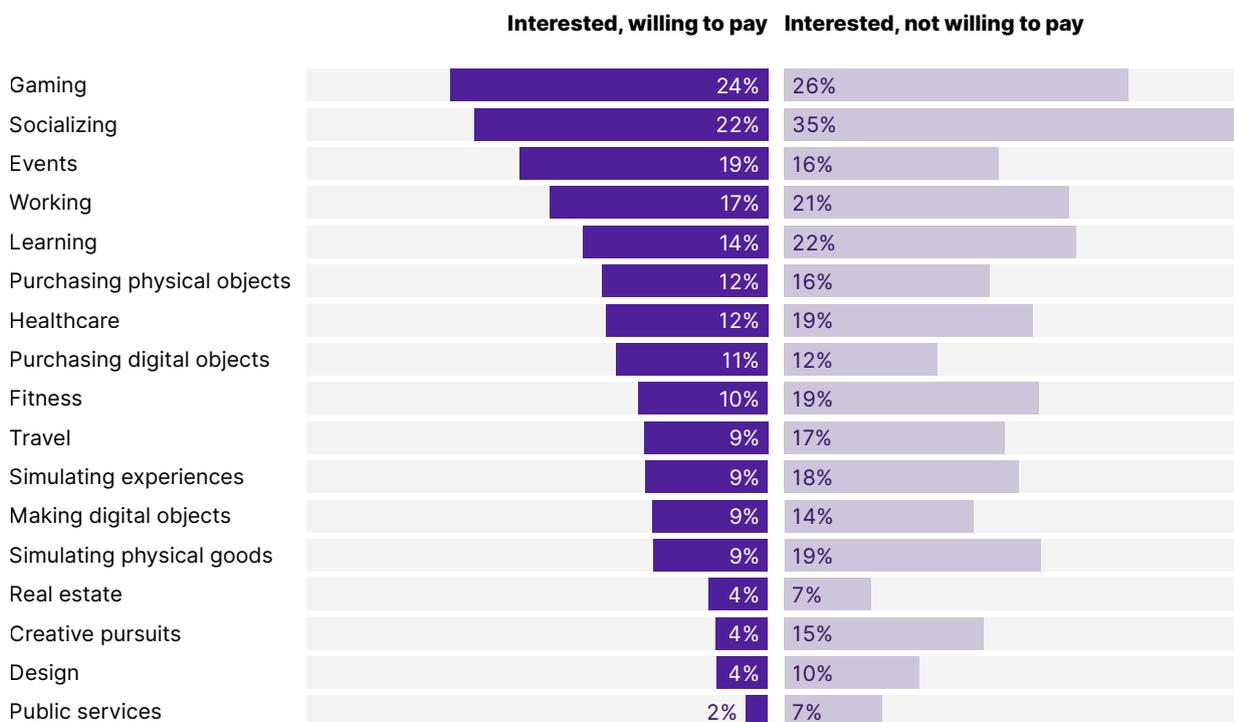
a metaverse game. Some of the most prominent P2E games include Axie Infinity, Alien Worlds, and Splinterlands.¹¹P2E is a particularly hot topic in Southeast Asia. A 2021 report from the Blockchain Game Alliance found that these games had a 22% share of all NFT trading volume, with NFT games generating \$2.3 billion of revenue between July and September 2021. As of October 2021, Sky Mavis, the company that pioneered P2E in Vietnam, raised \$152 million to develop Axie Infinity, an extended gaming ecosystem with backing from a16z. With Southeast Asian gaming markets ranging from Singapore’s \$327 million to Indonesia’s \$1.7 billion, P2E has significant potential to grow.¹²

One question related to P2E is how the game developers make money when they are paying users to play the game. While business models can vary, the most common approach is to charge transaction fees for new users purchasing the in-game currency. The game is most profitable for the developer if new users are always joining, and if the users do not convert the in-game currency into a different token and instead continue to use it for in-game purchases from the developers.¹³

Commerce for in-world goods/skins for avatars in video games

Payments for add-ons in video games, like outfits and items for avatars, are expected to

Exhibit 2: Activities Metazens are interested in doing in the metaverse and may pay for



Source: Oliver Wyman Forum Global Consumer Sentiment Survey 2021

grow. Consumers spent over \$15 billion on randomized “loot boxes” in 2020 and that number is expected to exceed \$20 billion by 2025.¹⁴ A key goal is to make in-game tokens and NFTs available across different worlds to unlock value.

Music and Entertainment

Moving beyond Phil Collins’ rendition of “In the Air Tonight” in Rockstar’s 2006 game *Grand Theft Auto: Vice City Stories*, metaverse virtual concerts allow for unrestricted numbers of people to watch artists perform. This has already happened in *Fortnite* with Travis Scott and Ariana Grande participating in virtual, live concerts.¹⁵

Marketing

As people spend time in a virtual world, they will be exposed to products and services in a way that hasn’t been experienced before, opening a new avenue for advertising, particularly to younger users.

Tourism

Experiencing unique, far away locations from the comfort of your living room allows for the excitement of traveling without leaving home.

Workplaces

Working from home has grown in popularity during the pandemic, but that has led to colleagues losing the benefits of working side-by-side in the office. Virtual office environments may be a metaverse solution to this problem. Several companies are building

Decentraland

Let’s take a deep dive into Decentraland. Marketing itself as the “first-ever virtual world owned by its users,” Decentraland gives its 18,000 active daily users a virtual destination on the Ethereum blockchain where they can buy and sell LAND, avatar wearables, and names using MANA.¹⁶ Within Decentraland, users can explore the landscape from more rural areas to urban ones, interacting with objects, buildings, art, games, and attending different types of events. Decentraland has come a long way since its proof-of-concept in 2015: The platform now includes games, interactive apps, in-world payments, and peer-to-peer communications for users.

If you are wondering why MANA and LAND are capitalized, it is because they are the two tokens that help make Decentraland run. LAND is an NFT that defines the ownership of virtual land parcels. MANA is the cryptocurrency used for purchases of LAND and all other goods and services in Decentraland. The number of individual parcels of LAND is permanently fixed at 90,601. As of January 2022, the most expensive plot of LAND was worth \$3.5 million worth of MANA, with the average 16m x 16m virtual parcel going for \$14,440.¹⁷ Like real-world real estate, location is what makes one plot of LAND more valuable than another; being near certain community amenities like Genesis Plaza (the central public spawn area) is seen as desirable. While some may question the value in Decentraland, the amount of money people are willing to pay for LAND shows that there is a market for it.

metaverse workplace platforms, ranging from Microsoft Teams’ exploration of “immersive spaces” with virtual reality/augmented reality platform Mesh to Meta’s Horizon Workrooms that use the Oculus headset.¹⁸

Real Estate

Land can be bought and sold in the metaverse with location being a primary driver of value, as is the case in the physical world. Location makes the gaming aspects of certain platforms more convenient by being close to virtual amenities and makes the virtual property more valuable for use in advertising and renting. In 2021, metaverse real estate sales reached \$500 million, and analysts say that it may double to \$1 billion by the end of 2022.¹⁹ The so-called Big Four metaverse real estate platforms are Decentraland, Sandbox, Cryptovoxels, and Somnium.²⁰ Collectively, they contain 268,645 parcels. One of the leading opportunities for metaverse real estate is renting space to companies trying to advertise to a younger, more digitally savvy crowd.

Financial Services

Virtual societies are already transacting and engaging in financial services in the metaverse. Financing can be provided for virtual goods, such as real estate. For example, banks in Asia are creating virtual spaces for education and product development while other institutions are using the metaverse for training employees and clients alike. NFTs are already a big part of this, but as we explain further below, in the future there will be multiple financial services use cases for the metaverse.²¹

Automotive and Manufacturing

Everything from factory training to testing the customer experience could happen in the metaverse, leveraging VR and AR technology.

Education

The pandemic displayed the shortcomings of a webcam-based remote education experience. The realism of the metaverse can improve on this and allow for a better educational experience for children in a remote environment.

Public services

Governments, particularly in South Korea, are exploring using the metaverse for public services. Examples include making civil complaints and reserving public spaces.²² Barbados announced in November 2021 that it would open the world’s first metaverse embassy in Decentraland.²³

For more on how some of these sectors may impact business in the next five years, see this [BRINK](#) article from Oliver Wyman.

Q: What are the emerging financial products related to the metaverse?

Expanding on the financial services use cases of the metaverse, a number of financial products have begun to emerge. These products are a complement to the presence of financial institutions in the metaverse such as JP Morgan’s Onyx Lounge and Kookmin Bank’s expansive metaverse town with a fully functional bank branch, telecoms center, and recreation center.²⁴

Mortgages for virtual land and houses are beginning

TerraZero Technologies issued one of the first metaverse mortgages in Decentraland in February 2022 for a \$45,000 parcel of LAND with an undisclosed interest rate and down payment.²⁵ TerraZero also is preparing to launch a property search website called AMADEA that will provide mortgage payment estimates for metaverse property.²⁶ While virtual homes are immune to fires and floods, they can still be susceptible to theft. Insurance against theft of virtual real estate, NFTs, and intellectual property may grow in line with the metaverse’s increasing prominence.²⁷

Financial products can take on many different forms. As illustrated in the figure below, financial products that exist in both the physical world for digital activities or solely within the digital realm can have a role in the metaverse. It is no stretch to imagine a loan to an artist developing in-world NFTs or to a P2E gamer who will pay back the loan, with interest, based on their gaming earnings. The use of NFTs can also have impacts on financial transactions outside the metaverse. Businesses can raise capital by providing investors with a NFT that can give discounts on future products without resorting to the typical fundraising tools of debt and equity.²⁸ They can use NFTs in trade finance to tokenize documents that prove ownership of goods and to facilitate the transfer of physical possession,²⁹ and they can borrow using NFTs as collateral.³⁰ Entirely new financial products may emerge given the richer ecosystems that Web3 can foster in smart manufacturing, telemedicine, and real estate, providing financial institutions with richer data and opportunities.

Exhibit 3: Metaverse Financial Products

Digital to physical

Firms use digital activity or collateral (e.g., crypto holdings, metavers plot) as basis for a “real world” product, like a personal loan in fiat

NFTfi, a DeFi protocol, provides loans in crypto and fiat using the borrower’s NFTs as collateral

Physical to digital

Firms use “real world” information (e.g., credit history) and collateral to offer digital-native financial product (e.g., loan in digital token)

TerraZero offers mortgages in Decentraland based on an individual’s real world credit history

Purely digital

A purely digital financial product where a digital-native financial product (e.g., a mortgage) is provided solely based on in-world holdings and activities

Axie Infinity allows for users to loan their NFTs to other players for payments in-game currency

Source: Oliver Wyman Forum

Q: What are some of the challenges to metaverse adoption?

As we mentioned, some of the projections of the metaverse's market size are extraordinary: as high as \$13 trillion in Citi's latest report.³¹ These numbers may be optimistic given many of the challenges to growing user adoption. As the Oliver Wyman Forum found, 76% of survey respondents in 10 major countries (including 79% in the UK and 80% in the US) are unwilling to pay money to participate in the metaverse.³² Obviously there is work to do in showing ordinary people the benefits it may bring. More specifically, other challenges include:

Hardware

Virtual worlds depend on their graphical interface and require have high computational power, as well as fast internet, to deliver an interactive experience. Users interact with virtual worlds through computers or new VR devices. VR sets are being built for use, but those interacting through their computers may find their devices are not up to snuff, while finding VR sets too expensive of an investment.

Interface

User interfaces are still being developed. The metaverse requires an interface that is easy to use and engaging. Twitter, a quintessential Web 2.0 platform, quickly gained users in substantial part driven by its attractive interface. By way of example, as of the third quarter of 2021, Twitter had average monetizable daily active users (mDAU) of 211 million whereas Decentraland has only 18,000 daily users.³³

Integration

Integrating metaverse worlds such that avatars and property can move freely and easily between them is essential to growing user adoption without siloing between platforms.

Safety

Users must feel that their data and transactions are secure, being confident that laws and regulations that protect them still apply in the metaverse, and that identity verification is secure enough that they are not interacting with scammers or other malicious actors.³⁴



“Users must feel that their data and transactions are secure, being confident that laws and regulations that protect them still apply in the metaverse.”

Importance of the metaverse

Q: How does the metaverse relate to the real world?

While the metaverse exists virtually, it can have a concrete impact on the real world in all of the areas where it has use cases, not just gaming. Education, office work, and perhaps even attending religious services may take on new forms and meanings. The growth of the metaverse may lead to fundamental changes in how life will be lived. With a new way of life comes new risks and obstacles to keep in mind as policy is made. The blending and blurring of the physical and digital worlds sounds exciting, but it also comes with risks for society, commerce, and policy.

There is a risk that without proper regulation and governance, the metaverse will become a Wild West where fraud, manipulation, and digital crime run rampant, perhaps even more so than on the current internet. Privacy can be invaded, intellectual property can be stolen, and children can be exploited in this unregulated scenario.

Q: What are some of the legal and regulatory issues related to the metaverse and NFTs?

Just as thinking on building the metaverse is being developed, thinking on regulating it is being developed in tandem. Addressing some of these issues will not be straightforward and addressing all of these may not be necessary to have a fully operational metaverse. As laws have developed over time in the physical world, they will be applied to the metaverse and NFTs among the following categories. Some of these regulatory issues include:

Property Rights and Transferability

As we describe in the next section, just as property law developed in the physical world, it must adapt to the virtual one as well. There are a number of open questions pertaining to applying existing intellectual property rights to metaverse intellectual property. At a more fundamental level, there are questions surrounding the different types of property in the metaverse: Metaverse intellectual property like a company's logo may require a different

regulatory regime than the virtual property, like an avatar's hat, that it is placed on.

Integrity and Verification

NFTs are valuable to the extent that their ownership can be verified on a public ledger, but even if the owner's identity can be verified, there may be issues with where it is hosted. If an NFT disappears from OpenSea, for example, it disappears from the owner's wallet as well.

Interoperability and Data Sharing

Integration across virtual worlds, and between the digital and physical, will require interoperability across the "technology stack," including digital platforms and hardware devices. Interoperability requires coordinated action and could be facilitated through policy and regulation.

Jurisdictional Considerations

There is a need to determine the jurisdictional boundaries of the metaverse, as virtual borders could be just as important as physical borders when formulating policies. Policymakers and executives will also need to understand the boundaries between metaverses and any consequential regulation.

Individual Risks

Individual risks in the digital economy and online harms may be exacerbated in the metaverse. These problems include privacy, discrimination, mental health, and misinformation. Additionally, political and

societal problems could be exacerbated. The existing digital divide of unequal internet access will affect access to the metaverse as well, and network effects in the digital realm could increase wealth inequality. Content moderation, and the concentration of moderation power, has been a source of controversy on Web2.0 platforms, and it will likely persist in the metaverse.

Market and Prudential Risks

Many of the worlds within the metaverse have their own coins, and integration across worlds (and with other cryptocurrencies) will depend on markets that are well developed with integrity. Increased growth could present risks to individuals and the broader economy in case of a crash or market manipulation.

Conduct Risks

Without addressing fraud and misconduct, a perception that the metaverse is unsafe could hinder user adoption. Links across metaverses and NFTs may increase the complexity of applying Anti-Money Laundering (AML) and Combatting the Financing of Terrorism (CFT) rules, and jurisdictional questions may hinder the ability to apply sanctions.

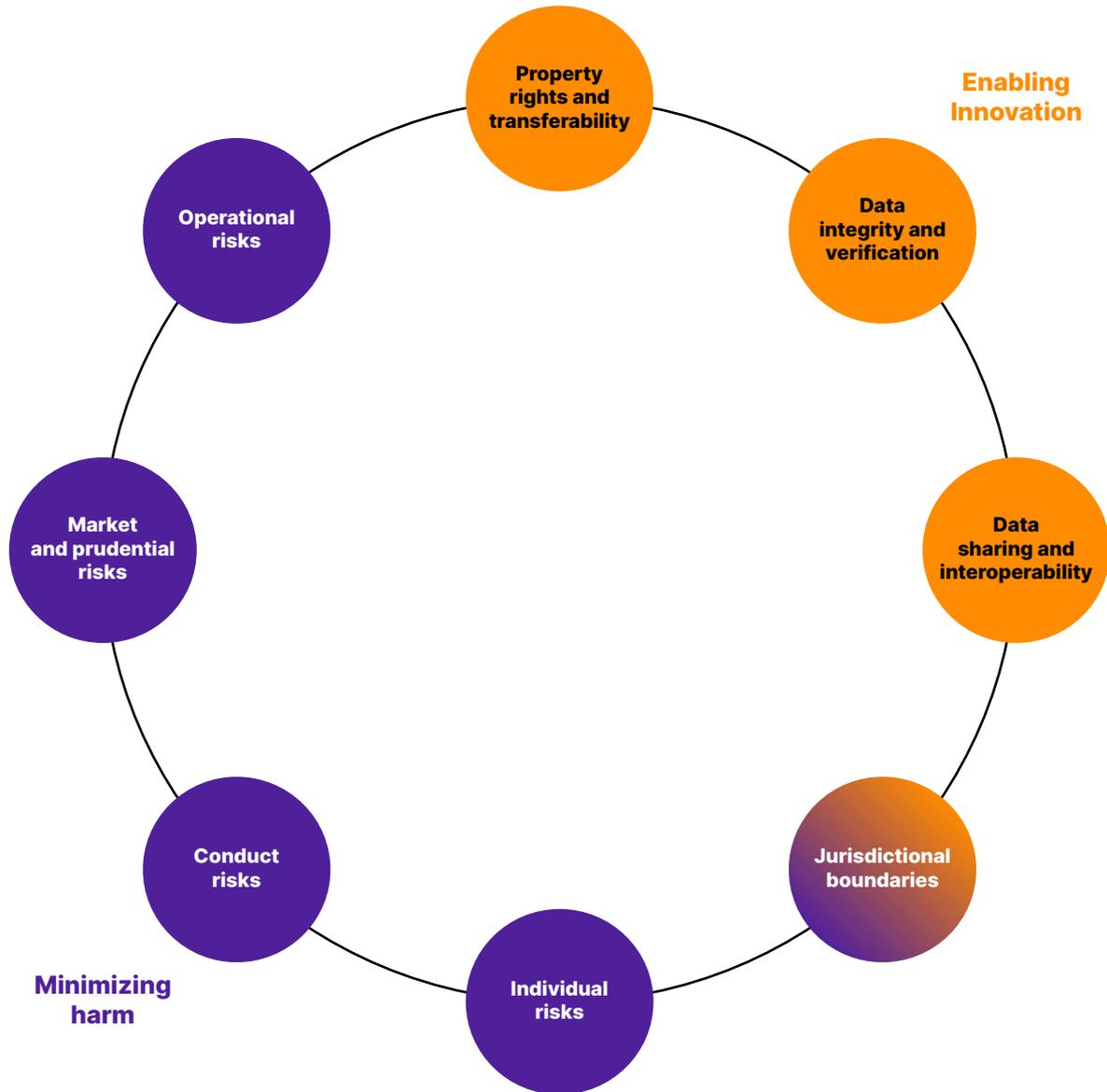
Operational Considerations

Ensuring that metaverses are able to stay online and that they are not prone to hacks is essential for developing an ecosystem that attracts users and prospers. The Ronin Network, which is the Ethereum-linked sidechain used for Axie Infinity, was hacked

in March 2022 resulting in a loss of over \$625 million, which may have been the biggest crypto hack ever.³⁵ Avoiding these

types of hacks is paramount for the future of the metaverse.

Exhibit 4: Key Regulatory and Legal Areas



Source: Oliver Wyman Forum

Virtual property rights considerations

Q: How do we think about property in the metaverse?

Modern legal frameworks to determine rights to different types of property have been developed over the span of hundreds of years. However, they were not developed with the metaverse in mind.

In many jurisdictions today, there are three categories of property and different rights that come along with them. These are:

Real property

Property that is tangible and not easily moved, like land or a house, where you have title that proves your possession.

Personal property

Property that is tangible but usually does not have formal evidence of ownership as it is easily transferrable. These are things like clothes or your laptop.

Intellectual property:

Property that is intangible and created as a result of the human intellect, such as patents and copyrighted books and art.

While it may seem simple to apply these categories to the metaverse, it is actually quite complicated. For example, NFTs in the form of digital art are most aligned with the intellectual property classification, but what happens when the NFT is a painting in a virtual house? If that is considered to be personal property, then the original creator may lose some of the protections that would come from their standard intellectual property rights. If someone's metaverse house itself is an NFT that someone else designed, there could be a situation where the house may be viewed as one person's real property or another person's intellectual property.

This is important given the rights that exist for different categories of property. Intellectual property rights protect intangible

assets through trademarks, copyrights, and patents. If everything in the metaverse is intangible, does that mean that metaverse houses are intellectual property and nobody else can copy the designs? These issues may require a new foundation for thinking about property rights given the lack of a clear framework to date.

Q: How can we begin to think about developing ownership rights over NFTs inside and outside the metaverse?

NFT ownership is least disputed in the realm in which it was established: its originating blockchain. However, NFT ownership in one blockchain does not inhibit another user from being able to see the image in another blockchain or digital milieu unless protections against this are enforced. In the absence of government regulations, platforms and blockchain communities are setting up their own rules. For example, Twitter has been limiting the use of NFT avatars unless proof of ownership can be established. Still, there are a number of factors that can be considered when developing an intellectual property rights framework for the metaverse.

Physical art ownership typically also allows control over physical access; however, a digital representation of the art may be made widely available unless copyrighted. With a photograph, under United States law, the photographer holds a copyright the moment the photo is taken. Apps like Instagram already make it challenging to enforce copyrights over

digital representations of photographs, but not all reproductions of a copyrighted image infringe on copyrights. The “fair use” doctrine allows someone to infringe on the copyright of a photograph for reasons such as educational dissemination, personal use, or research purposes. This may serve as a blueprint for NFTs.

When a creator makes or “mints” an NFT, they have the right to sell the rights to the NFT. But things get trickier with future use operating under a license. This will require licensing agreements to be more refined to specify the precise uses the creator envisions. Contractual law issues abound with smart contracts built into NFTs that make royalty payments, further complicated by jurisdictional issues over which contract law applies. The actual content represented in an NFT is subject to potential legal controversy: An NFT that portrays illegal, obscene imagery or that unlawfully infringes on a copyright will likely be prohibited. NFT sales platforms should have the infrastructure to respond to government orders to remove unlawful or illegal content.

The physical world owners of metaverse property are still mortal. The private keys they use to control that property may be lost upon their death. Inheritance and estate laws do not have a solution to this issue, so without appropriate regulation, the rights to the property risk being forever lost or tied up in probate courts.³⁶

We are beginning to see NFT projects experiment with different types of intellectual property rights frameworks.

Bored Ape Yacht Club grants every NFT owner intellectual property rights to use their specific NFT for commercial purposes while the Bored Ape Yacht Club brand is still owned and controlled by Yuga Labs, its developer.³⁷

CryptoPunks, developed by LarvaLabs, calls for a system that prevents owners from repurposing their CryptoPunks NFTs for any reason, reserving the right to do that solely to LarvaLabs itself. Users can use their NFT License only for personal, non-commercial use without the ability to modify the art or sell third-party products with the NFT.³⁸

As a response to the more closed systems of the Bored Ape Yacht Club and CryptoPunks, a licensing regime called **Creative Commons Zero (CC0)** is emerging. This champions open-sourced innovation and allows the intellectual property of a CC0 project to be used for free without any need for attribution, whether it is just a single associated NFT or the entire collection of NFTs. CC0 NFTs allow for them to be disseminated to the public more easily without the need for licensing or fears over intellectual property infringement. Among the most prominent CC0 NFT projects are CrypToadz and Blitmap.³⁹

These different models are not merely for academic debate: They raise fundamental questions over the purpose of NFTs inside and outside the metaverse. Depending on which model becomes the most prominent, NFTs can range from something that can be used and built on or simply something to be looked at and enjoyed privately unless a paid license was provided.



“These different ownership rights models are not merely for academic debate: They raise fundamental questions over the purpose of NFTs inside and outside the metaverse.”



Conclusion

The astronomical growth of the metaverse and NFTs highlights the need for debate about the policies and regulations that should govern this activity. This paper provides a primer on what the metaverse and NFTs are, who uses them, and how they have been and will be used. Beyond the intellectual property issues addressed in this paper are a bevy of other regulatory questions pertaining to jurisdictional considerations, market risks, and conduct risks affecting both developers and users.

Furthermore, there are questions about the complexity surrounding how the markets for NFTs and the metaverse work and the economics that make them run. Knowing why someone would choose to purchase a certain NFT over a different one matters for business leaders strategizing their entry into this space. Understanding the link between the metaverse and the potential consequences for cryptocurrency is vital for regulators developing their approach. The decisions made by regulators and business leaders on these issues will shape the way we live our lives for years to come. Only with a firm understanding of such elements can regulation and business models adapt to harness the values of Web3 like user choice, privacy, and decentralization.

“The decisions made by regulators and business leaders on these issues will shape the way we live our lives for years to come.”



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