AMERICAN BANKRUPTCY INSTITUTE

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The Global Metaverse Market: Valuing Property in the Next Frontier (We're Not in Kansas Anymore)

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2023

The Global Metaverse Market:

Valuing Property in the Next Frontier
(We're Not in Kansas Anymore)

The Panel

- **Jeremy Dalton**
  - Head of Metaverse Technologies, PwC US
- **Judge Elizabeth L. Gunn**
  - U.S. Bankruptcy Judge for the District of Columbia
- **Cullen Murphy**
  - Executive Director, Moelis & Company
- **Jennifer E. Neubauer, Esq.**
  - Assistant General Counsel, the Ladies Professional Golf Associations (LPGA)
- **Dan Jasnow, Esq. – Moderator**
  - Partner, ArentFox Schiff LLP

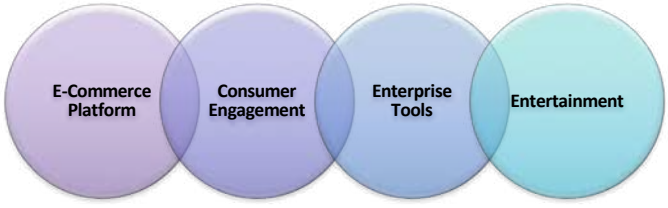
Objectives

- **Understanding the Metaverse**.
  - What is the Metaverse?
  - How was it created?
  - Why was it created?
- **Using the Metaverse**.
  - How are people/businesses/industries using the Metaverse?
  - What is driving investment in the Metaverse?
  - How is value being derived in the Metaverse?
- **Strategizing for go-forward value capture in the Metaverse**.
  - It's 2023 – where do we go from here?
  - What will be the Metaverse's impact long term?
  - Strategies for capturing value in the Metaverse.

Understanding the Metaverse

What is the Metaverse?

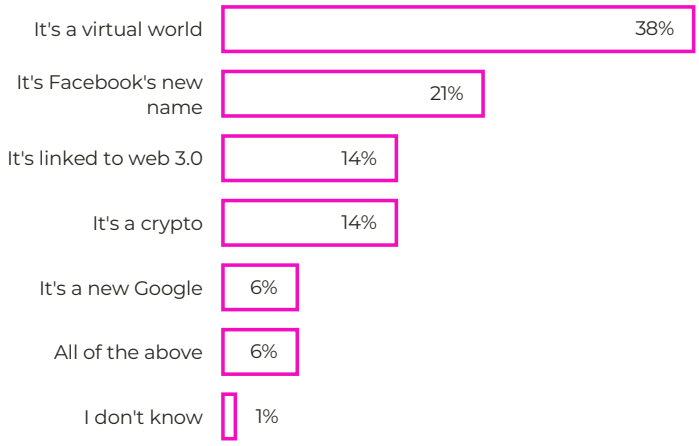
- **The truth is – it is difficult to define. It is many things to many people, businesses, industries.**
- **The "immersive" Internet.**



"We believe the metaverse will be the successor to the mobile internet, we'll be able to feel present – like we're right there with people no matter how far apart we actually are[.]"

– Mark Zuckerberg (during Facebook's announcement on 10/28/2021 of its rebranding as "Meta").

The metaverse according to its investors

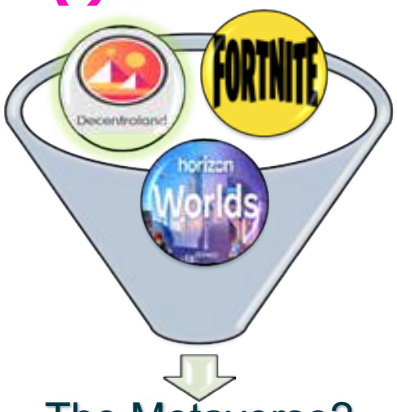


The metaverse is the convergence of the physical and digital world

INFORMATION IMMERSION CONNECTIVITY

Today's Metaverse(s)

- The metaverse or "metaverses"?
- Major brand activity is happening on Decentraland; Sandbox; Fortnite; Horizon Worlds; Roblox, etc.
- Key Features: 3D; social; unscripted.
- One day, the platforms may be interoperable, but not yet.



How to Access:

- Meta Quest headset

- www.Decentraland.org
- Need a blockchain wallet

- www.Roblox.com
- Do not need a blockchain wallet

- PS, Xbox, mobile device

- Private or gated applications
- NFT or invitation required

Metaverse Assets

- Consumer-facing platforms (e.g., NBA Top Shot, Nike Dot Swoosh)
- Digital infrastructure (blockchains, nodes, wallets)
- NFTs (digital "deed of ownership" for digital or physical assets: art, real or virtual real estate, blockchain domains, tickets, time shares, etc.)
- Cryptocurrencies and other tokens
- Digital 3D models (apparel, products, buildings, factories)
- User Generated Content
- Data
- Hardware (consumer electronics)

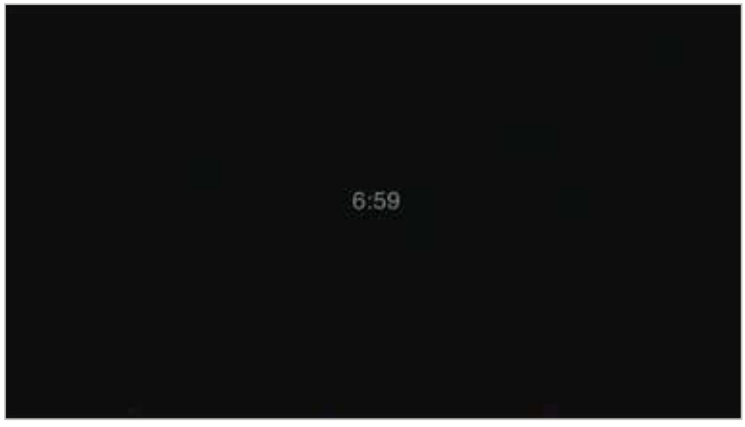
Wearables & Consumer Electronics

- The race is on for next gen wearables that will create the immersive metaverse experience.
  - PlayStation VR
  - Meta Quest 2
  - Electromyography (EMG) & Wrist Based Interactions
  - Apple Headset

Apple is expected to emerge as a new player later this year

- **Over 500 patents granted relating to VR, AR, smart glasses and other head-mounted displays**
- **3,000 people hired reportedly to work on its upcoming headset**
- **'realityOS' references Trademarked + found in App Store upload logs and in Apple code**

Tomorrow's Metaverse?



Using the Metaverse

ArentFox Schiff Metaverse Office

Using the Metaverse - Nike

.SWOOSH is the home for all of Nike's virtual creations. Nike virtual creations are typically interactive digital objects (think virtual shoes or jerseys) that can be worn as wearables in video games or other immersive experiences (we'll be announcing which ones soon).

As of August 2022, Nike sales of digital wearables had generated $185 million.

Nike

engages consumers from all over the world in new ways

Using virtual worlds

Outcome: 6.7 million visitors to Nikeland from 224 different countries

Dolce & Gabbana

is selling ‘phygital’ attire and unique experiences

Via NFTs

Outcome: D&G’s nine-piece Collezione Genesi NFT collection fetched $5.7m in revenue for the company

Using the Metaverse - Starbucks

- **Features:**
  - Earn and purchase digital collectible assets (NFTs) that will unlock access to new benefits and immersive experiences
  - Each digital collectable stamp includes a point value based on rarity. As stamps are collected, members' points increase, unlocking access to benefits and experiences, such as a virtual espresso martini-making class, access to unique merchandise and artist collaborations, invitations to exclusive events at Starbucks Reserve Roasteries, or trips to Starbucks Hacienda Alsacia coffee farm in Costa Rica.
  - Stamps can be bought or sold among members.
- **Key Stats:**
  - 56% of Starbucks transactions in FY23 Q1 were from Rewards Members.

"Our digital platforms have been very sticky with customers. And we're just making those better as you look at things like Odyssey and Reward together.

"For the first time we are connecting our Starbucks Rewards loyalty program members not just to Starbucks, but to each other."

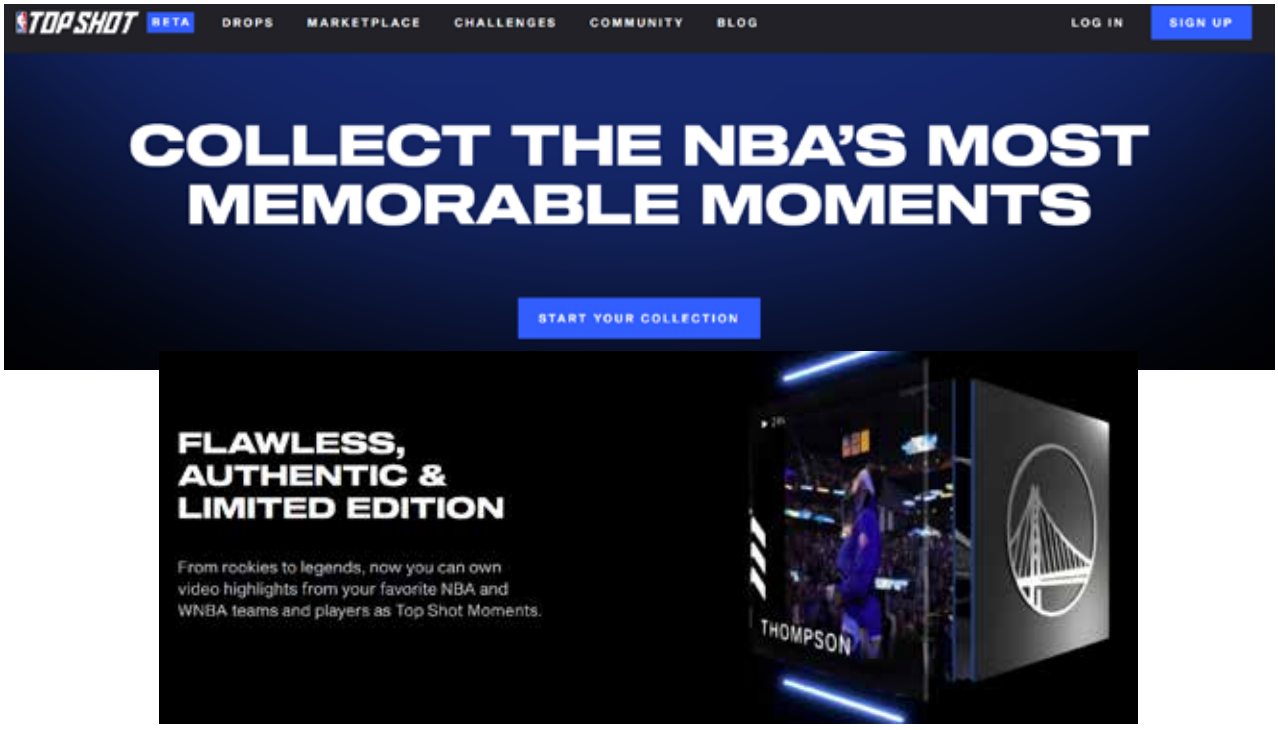
- **Brady Brewer,** Starbucks executive vice president and chief marketing officer.

Using the Metaverse - LPGA

1. **What types of metaverse opportunities has LPGA explored?**
2. **What are the business considerations that are driving these explorations?**
3. **What challenges/obstacles are you having to navigate?**

Using the Metaverse – LPGA IP Considerations

- **The LPGA has filed trademark applications for LPGA and its "Golfer" logo signaling plans for:**
  - ✅ NFTs + NFT-backed media
  - ✅ Retail stores featuring virtual goods
  - ✅ Virtual footwear, clothing, headwear, bags, sports equipment + sporting events



PwC in the metaverse

TOM FARREN DEC 23, 2021

PwC Hong Kong purchases land plot in The Sandbox

pwc

PwC

is tackling unconscious bias through the deployment of immersive training

Using virtual reality

Outcome: Increase in empathy, even when compared to equivalent desktop training

PwC

recruits students and introduces them to the company culture

Using virtual worlds

Outcome: ~ 30,000 students have engaged with PwC through Virtual Park to date

Strategizing for go-forward value capture in the Metaverse

Valuation

How do you assess deal value when the landscape is so volatile?

- Crypto / token value and vol – currency or standalone value?
- Software, data, and intellectual property valuation
- Network usage and externalities

The intangibles

- Brand identity/goodwill -> will it help or hurt?
- Earned media
- First mover advantage

Balancing Risk

- Organizational risk tolerance
- Unsettled legal landscape (i.e., securities)
- Getting "left behind"
  - Staking out "digital real estate"
  - Proactively protecting your real-world brand and I.P.
  - Understanding major market developments

Pros and Cons of Public Blockchains:

- Transaction data is accessible but not always reliable
- Wash trading: when someone sells a digital asset to themselves to create an illusion of demand.
- Despite being public, data can be difficult to retrieve and analyze

Some large transactions for digital assets occurring "off-chain"

Locking in value and hedging against loss

Key commercial terms to consider:

- USD or Crypto?
- Guarantees
- Insurance
- Work product ownership
- Future revenue streams

Need for enhanced access control and security protocols.

- Elevated risk of total loss.
- Special training required for cold/hot wallet management.
- Custodial platforms a potential solution.

Crypto-Related Distress & Restructuring

- **Exchanges: Voyager, Celsius, FTX, BlockFi**
- **Bitcoin Miners: Core Scientific, Greenidge**
- **Banks: Signature Bank, Silvergate Bank**
- **Investors/ Hedge Funds: Three Arrows Capital, Cred Inc.**

Metaverse Investment Drivers

- **What is driving investment in the Metaverse?**
  - Top metaverse use cases for 2023
  - Enterprise metaverse (digital twins and manufacturing)
  - Other?

Regulatory Treatment

- **There have been disagreements between the CFTF and SEC on whether cryptocurrencies and some other blockchain based tokens are commodities or securities.**
- **The IRS has put out guidance suggesting it might treat some NFTs as "collectibles," subject to a higher tax rate than capital gains.**
- **Accounting standards for crypto and other blockchain tokens**
- **How, if at all, does this uncertainty about classification affect treatment of these assets and valuation?**
- **Regulatory actions against crypto related organizations.**

Hypothetical – Metaverse Bankruptcy

AcmeVerse is a popular metaverse platform that consists of map containing 10,000 plots of virtual real estate. Plots can be bought or sold for ACME, the platform's native currency. Ownership of each plot is represented by an NFT. The AcmeVerse DAO created AcmeVerse and sold off all the initial NFT plots. Plots are independently owned by third parties and can be developed by their owners. The AcmeVerse DAO continues to operate the platform and derives a royalty of 10% from secondary transactions (in perpetuity), plus 3% on all transactions that occur in the AcmeVerse. Proceeds go into a central treasury.

Following launch of its metaverse platform and native token, the AcmeVerse DAO decided to use its reserves of ACME to fund the development of a token exchange where consumers can purchase ACME and exchange it for other tokens. Customers hold their funds on the exchange in either earn accounts receiving some return or in withhold accounts.

The DAO uses certain of the deposits as collateral for loans it receives for, among other things, expanding its metaverse platform and creating new virtual plots.

The value plunges on the ACME, causing covenant breaches in the DAO's borrowing facilities and a run by customers to withdraw tokens including those pledged to the DAO's lenders.

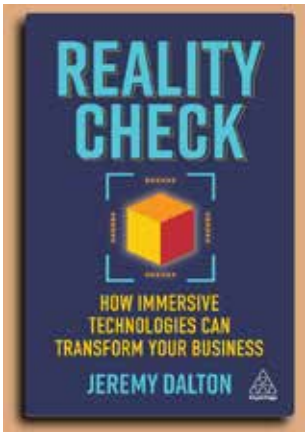
Takeaways and Looking Ahead

What does the future hold?

Questions?

Want to Learn More?

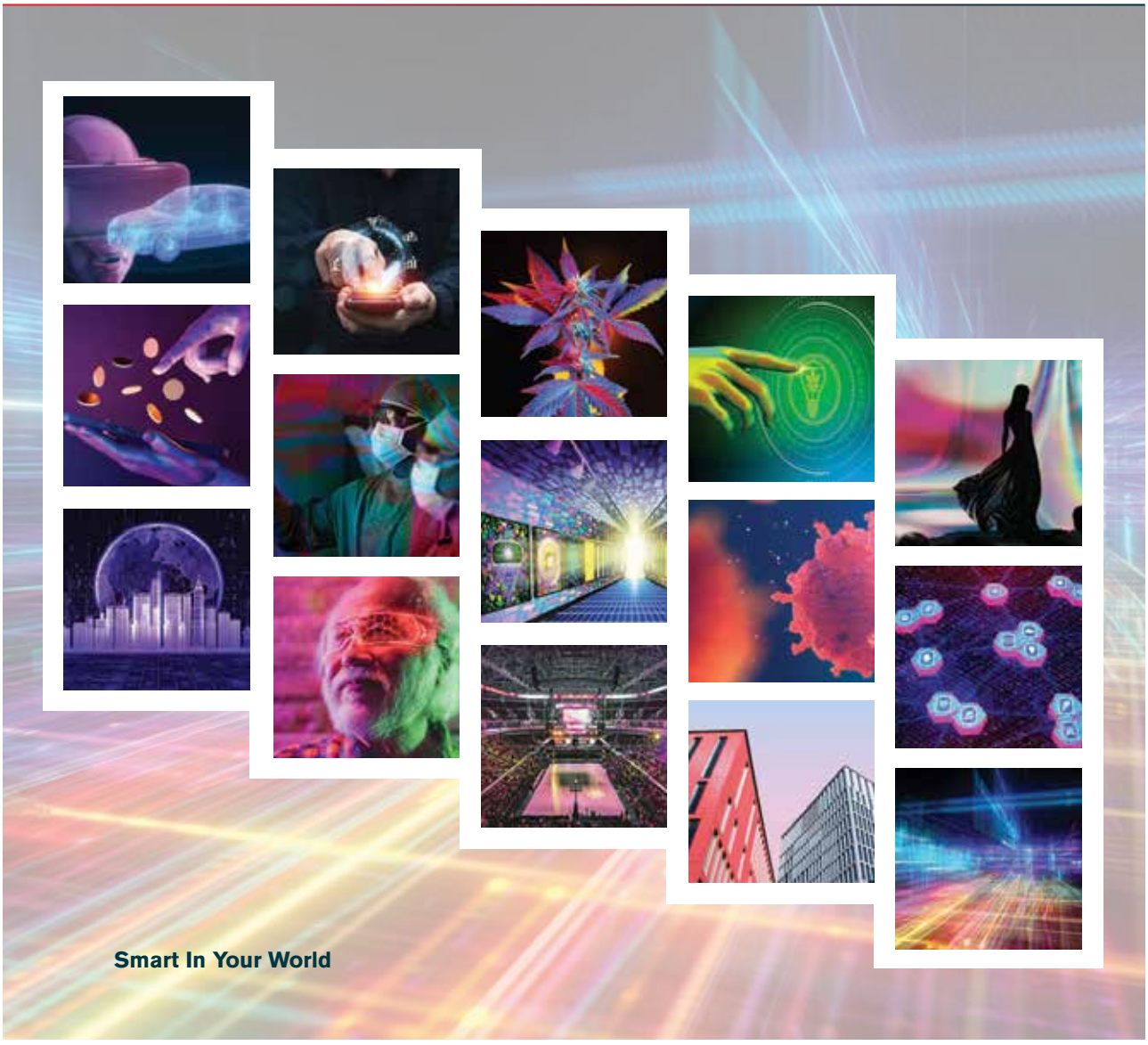
- Reality Check, Jeremy Dalton
- The Metaverse, Matthew Ball
- ArentFox Schiff Industry Guide to the Metaverse
- McKinsey & Co., Value Creation in the metaverse



The End

ArentFox Schiff

ArentFox Schiff Industry Guide to the Metaverse



Industries Covered

About Us

ArentFox Schiff LLP is internationally recognized in core industries where business and the law intersect. With more than 650 lawyers and policy professionals, the firm serves as a destination for an international roster of companies, governments, individuals, and trade associations.

A Message From Our Leader

ArentFox Schiff was the first big US law firm to buy a stake in the Metaverse. To be a virtual pioneer in this new frontier was a no-brainer. As go-to advisors on blockchain and digital assets, we are helping world-class brands build their presence in the Metaverse and wanted to be close to our clients.

The Metaverse stands to disrupt nearly every industry – fashion, sports, real estate, the list goes on – presenting immense possibilities and potential risks. Working alongside top companies in these sectors, ArentFox Schiff knows the business as well as we know the law. As we have already seen, many of the issues facing clients in the physical world are also present in the virtual world. ArentFox Schiff is uniquely positioned to help navigate both.

With a focus on 14 industries that could be digitally transformed, we created the ArentFox Schiff Industry Guide to the Metaverse to answer your initial questions and anticipate your concerns. This is a thrilling moment for any business willing to make the move. We will get you across the finish line.

Anthony V. Lupo
Chairman

AUTOMOTIVE

Time For A Test Drive?

Aaron H. Jacoby, Eva J. Pulliam, Veronique H. Tu, Christine Chong, Dan Jasnow

Buying a car has evolved from the days of brick and mortar dealerships to e-commerce, where consumers can select their preferred dealer, reserve, order, finance, and purchase a new or used vehicle in a seamless transaction. Is the Metaverse the next evolution for buying a car? While there is no replacement for an actual test drive, the Metaverse offers a myriad of opportunities for dealers to engage interactively with consumers beyond traditional advertising.

Consumers already shop online, and the lure of buying a car immersively from the comfort of your home is undeniable. Manufacturers are already venturing into the Metaverse, including one Metaverse hosted on Roblox that allows users to experience the latest advanced racing technologies and motorsports available via the company's latest high-performance car. It's never too early for dealers to start exploring the Metaverse to connect with consumers.

Metaverse 101

The Metaverse is a 3D immersive virtual environment that can support interactions between individuals and businesses using an avatar. Undoubtedly consumers will choose the virtual world where their friends play and hang out. The use of cryptocurrency transactions facilitated by blockchains allows a consumer in the Metaverse to make virtual items exchangeable for real economic value beyond the virtual world. These secure transactions are digitally recorded on a distributed ledger. Users must have a digital or crypto wallet to play and do business in the Metaverse. There are a variety of virtual worlds that users can select, including Decentraland, Somnium Space, and The Sandbox. To access these virtual platforms, a user may need a virtual reality (VR) headset, augmented reality (AR) goggles, or a smartphone. Decentraland is built on a web-based, 3D rendering software that allows for interactions on the blockchain. No VR headset or AR goggles are required.

Before dealers journey into the Metaverse, there are several key issues to consider.

1. **Cybersecurity.** It's no secret that cyber-attacks against corporate networks occur on a weekly basis, and there is no sign that these attacks are slowing down. As part of these cyber-attacks, it is safe to say that phishing attacks will increase exponentially. In the Metaverse, these attacks include malicious schemes to dupe people in order to gain access to personal information and data or cryptocurrency wallets. The use

of vulnerable AR/VR devices can become an entryway for malware invasions and data breaches.

2. **No Central Authority.** Since the Metaverse is built using blockchain technology instead of centralized services, there is no designated administrator or authority; therefore, there is no possible way to retrieve stolen or illegally obtained assets.

3. **Privacy.** Setting up a virtual dealership comes with privacy obligations, particularly depending on the residency of the customer (e.g., California, Colorado, Connecticut, Illinois, Texas, Utah, and Virginia). Privacy considerations are integral, not only due to the increased quantity of personal information collected in the Metaverse, but also the additional categories of sensitive personal information implicated, such as biometric data, that can be collected through the use of AR/VR headsets. The Metaverse will allow virtual dealerships to have the ability to track interactions between users, track eye movements, and body movements—types of personal information that dealerships may not have been able to track before. Careful notice and consent, security, and systems control requirements must be considered in the initial stages of setting up the dealership, as notice should be provided at the time of collection, and consent should be obtained before personal information is collected.

4. **Establish A Dedicated Legal Entity.** Dealers may want to consider setting up a new subsidiary or affiliate to hold future digital assets, shield other parts of their business from Metaverse-related liability, and deal with the potential tax consequences.

5. **Taxes.** The IRS treats "virtual currency," including cryptocurrency, as property; therefore, general tax principles apply to property transactions using virtual currency. The sale or other exchange of virtual currencies, or the use of virtual currencies to pay for goods or services could result in tax liability. The IRS is making cryptocurrency fraud a priority and aggressively pursuing taxpayers who fail to report crypto-related income.

6. **Regulatory Compliance.** Manufacturers and motor vehicle dealers must follow both the Federal Trade Commission Act and other regulations that address the sale, marketing, and advertising of motor vehicles. Section 5 of the Act allows the FTC to act in the interest of all consumers to prevent deceptive and unfair acts or practices. Moreover, the Act prohibits unfair or deceptive advertising in any medium. Historically, the FTC has been extremely aggressive in enforcement actions against dealers for deceptive price advertising. It is only a matter of time before the FTC and state attorney generals begin scrutinizing the Metaverse to protect the automotive shopping public.
   - Advertising in the Metaverse must be truthful and not mislead consumers.
   - Claims about products or services must be substantiated, especially when they concern fuel economy, safety, or performance.
   - Dealers contemplating advertising offers in the Metaverse must consider placement of disclosures that are clear and conspicuous. In 2013, the FTC updated its business guidance document "Dot.Com Disclosures" to counsel digital marketers on how to provide clear and conspicuous disclosures of information that consumers needed in order to make informed decisions about goods and services on the internet. On June 3, 2022, the FTC requested public input about potential updates to this guidance document. Since it has been almost a decade since the guide was last updated, it does not address much of the new technology that has emerged and the evolution in online advertising. With the request for comments, the FTC

identified 16 key questions on which it has a particular interest in obtaining the public's view, including: "Should the guidance document address issues that have arisen with respect to advertising that appears in virtual reality or the Metaverse, and, if so, how should those issues be addressed?" It is clear that the FTC is already concerned about advertising and marketing directed at consumers in the Metaverse and making it a priority.

- Virtual dealerships must comply with the Truth in Lending Act (TILA): Regulations M and Z.

- Environmental claims. Electric and hybrid vehicles are here to stay. Claims about the environmental benefits of these vehicles must comply with the FTC's Green Guides. It is deceptive to misrepresent either directly or indirectly that a product offers a general environmental benefit. Ads should qualify broad environmental claims or avoid them altogether.

- Vehicle demonstrations must show how the product will perform under normal use. As previously mentioned, regulators will be scrutinizing the Metaverse, and product demonstrations could be at high risk if products are not demonstrated properly or performance and safety claims within the demonstration are exaggerated.

- Class actions. False and deceptive advertising in the Metaverse can lead to the FTC joining other law enforcement agencies (e.g., state attorney generals), and dealers potentially can face enforcement actions or civil lawsuits with fines up to $46, 517 per violation should they occur.

7. **Intellectual Property.** Dealers should consider filing for trademark applications covering Metaverse goods and services and secure any available blockchain domains to process Metaverse payments. See our previous alert on Protecting and Enforcing IP Rights in the Metaverse for more detail.

8. **Location, location, location.** What is the right Metaverse for my virtual dealership? Each platform has its own advantages and disadvantages including unique features such as gaming, creating your own avatars and building architecture, purchasing digital plots of land or access to unique NFT collections.

Dealers considering setting up shop in the Metaverse must comply with advertising laws and regulations in creating their long-term strategy for a virtual dealership. Even though the Metaverse is still evolving, opportunities include establishing a virtual dealership for customers to ask the dealer questions about their vehicles, take a test drive, or even just view vehicles.

Ready To Drive Into the Metaverse?

As automobile manufacturers drive into the Metaverse to reach consumers, it is only natural that dealers will also want a presence to connect directly with customers in the Metaverse. As with all new evolving technology, there are legal and regulatory issues that need to be considered. The lawyers in ArentFox Schiff offer a cross-disciplinary perspective to help motor vehicle dealers develop creative and practical tactics to maximize the value of the opportunities created by the Metaverse.

BEVERAGE & FOOD

Transforming Marketing & Sales

Jay L. Halpern, Amal U. Dave, Dan Jasnow, Scott L. Gates

The Metaverse is widely regarded as the next frontier in digital commerce, with businesses across industries spending millions of dollars buying digital real estate and investing in platforms to be market leaders. Alcohol beverage brands are also leading the charge, with companies like Jose Cuervo and Heineken announcing forays into the Metaverse. But what opportunities does the Metaverse hold for the alcohol beverage industry, which ultimately relies on "real world" product sales? And what legal challenges do alcohol beverage companies face in the Metaverse in light of the regulatory scrutiny they face in the physical world?

Overview of the Metaverse

At its core, the Metaverse is a 3D version of the internet that allows individuals to transition between physical and virtual spaces. Imagine, for example, a consumer browsing wines in a virtual wine store—picking up bottles, inspecting labels, turning the bottle over to read about provenance or tasting notes, and then purchasing a bottle to be delivered to their home. For the alcohol beverage industry, the Metaverse offers suppliers and retailers an opportunity to transform the e-commerce experience while providing ample new marketing opportunities. While some elements remain aspirational, many tech companies are already working on next-generation consumer electronics such as smart glasses intended to make three-dimensional e-commerce more accessible than, and preferable to, the two-dimensional experience of browsing on a smartphone or desktop computer.

But the Metaverse will also pose challenges for an industry that is governed by a 50-state patchwork of Prohibition-era regulations. Even more than the internet of today, the Metaverse is a borderless digital network without a definite physical presence or central authority (such as a social media network or web hosting provider). With many of its most popular platforms built on blockchain technology, these platforms do not operate on a single web server. Instead, content is distributed across numerous computer servers via a peer-to-peer network, raising a host of questions about applicable law, such as licensing requirements, tied-house and trade practice issues, and the location of e-commerce sales for tax and regulatory purposes.

Relevance to the Alcohol Beverage Industry

There are a number of ways that alcohol beverage companies can use the Metaverse to generate value, including:

1. **E-commerce.** As noted above, the Metaverse has the potential to transform brands' e-commerce experience. While much improved in recent years, today's e-commerce experience mostly cannot rival the experience of browsing in a wine or liquor store. The drawback of online shopping is especially acute for luxury, limited supply, or craft beverages that depend on attractive labels, branding, or shelf placement to draw consumers' attention. By building a virtual, three-dimensional experience in the Metaverse, alcohol beverage brands can build the platform and the virtual space that will power their next-generation e-commerce experience.

2. **Consumer Sales and NFTs.** In addition to providing a more robust and immersive e-commerce experience, the Metaverse and blockchain technology afford an opportunity to commercialize products in new ways. Unlike most consumer products, every vintage or batch of fine wine or distilled spirit may offer subtle differences in flavor profile. Collectors often seek products of specific vintage or from specific vineyards or distilleries. While more widely known to certify ownership of digital assets, such as artwork or videos, NFTs can also be used as a secure and verifiable digital receipt for the purchase of a physical asset. Imagine, for example, a Scottish distillery selling an NFT redeemable for a future bottle of aged single cask Scotch whisky or a French vineyard selling an NFT redeemable for the product of a particular vintage year. Collectors could sell the NFT, and thereby the future right to possess the physical product, on the secondary market before the product ever leaves the distillery or vineyard, with each transfer recorded securely on a blockchain. After bottling, high-value collectors' items could be auctioned or sold while the product remains safely in a climate-controlled warehouse or cellar, with the NFT verifying current ownership. Smart contracts coded into the NFT could require payment of a royalty to the producer every time the product is re-sold. Indeed, alcohol brands such

as Glenfiddich and LVMH have already started experimenting with NFTs redeemable for actual bottles.

3. **Marketing and Sponsorship Opportunities.** Virtual events in the Metaverse present a new platform for sponsorship opportunities for alcohol beverage companies. Concerts, games, and other events in the Metaverse all provide venues for alcohol beverage companies to market products. The popular online video game, Fortnite, for example, hosted a digital concert with rapper Travis Scott that attracted more than 45 million viewers over five performances, while Roblox hosted a virtual concert experience with Lil Nas X that attracted more than 30 million viewers.

Legal Issues for Alcohol Beverage Companies

The marketing and sale of alcohol beverages and related products in the Metaverse raise a number of legal considerations, including:

1. **Licensing.** In all 50 states and the District of Columbia, the unlicensed sale of alcohol beverages is prohibited. Sales of alcohol beverages in the Metaverse will almost certainly be subject to the same licensure requirements. But there is no certainty about whether federal, state, and local alcohol beverage regulators will treat the sale of NFTs entitling the bearer to redeem the NFT for an alcohol beverage as a retail sale of an alcohol beverage requiring a license. Accordingly, unless and until there's a uniform response among the states, alcohol beverage companies issuing NFTs in the Metaverse will need to evaluate the licensure requirements in each state in which the NFTs are sold.

2. **Tied-House Compliance.** In the United States, federal and state laws generally divide the production, marketing, and sale of alcohol beverages into three tiers: producers/importers, distributors/wholesalers, and retailers. Federal and state laws generally prohibit individuals and entities having an interest in one tier of the alcohol beverage industry from having an interest in another tier. These rules generally prohibit producers/importers of alcohol beverages from selling their products directly to consumers, with some *limited* exceptions (e.g., on-premise sales by wineries, breweries, and distilleries are permitted in some jurisdictions). Jurisdictions are still working out how these prohibitions will apply to sales of alcohol beverage NFTs that entitle their holders to redeem the NFTs for physical bottles of alcohol. Nevertheless, brands considering offering NFTs for sale in the Metaverse (or anywhere else for that matter) should carefully evaluate whether these sales, or subsequent fulfillment upon redemption, would comply with tied-house rules in the jurisdictions in which they are being sold.

3. **Advertising Specialties.** Tied-house laws also generally prohibit producers/importers from giving anything of value to retailers. One exception is for point-of-sale advertising materials and promotional items that are intended to be carried away by consumers. For example, in many states, producers may provide retailers with branded glassware, bottle openers, corkscrews, coasters, etc., that are designed to be carried away by consumers, as well as point-of-sale signage advertising the producers' brands for display within the retail location. States differ, however, in their treatment of these permissible "advertising specialties." A small number of states prohibit them altogether, while others impose a variety of limitations on dollar value or type of item. Brands looking to provide virtual items such as NFTs or signage in a virtual bar will need to carefully evaluate the application of the advertising specialties rules across jurisdictions.

4. **Sponsorship Agreements.** Many states regulate sponsorship agreements between suppliers and retailers. These limitations frequently arise in

the context of sponsorship agreements between suppliers and professional sports teams or their venue operators since most venues hold retail licenses to sell alcohol beverages. In states such as New York, suppliers must be careful to ensure that sponsorship revenues do not flow between the supplier and the entity holding the retail license, even indirectly. The Metaverse may provide more flexibility for suppliers to sponsor virtual events hosted by retail licensees, including professional sports teams, but suppliers will need to work diligently to understand the jurisdictions implicated by their sponsorship activities.

5. **Labelling Compliance.** Physical bottles of alcohol beverages must comply with applicable labeling regulations (e.g., obtaining a TTB-required Certificate of Label Approval). Until there is further guidance on whether and how these regulations apply to virtual representations of alcohol beverages in the Metaverse, companies should strive to mirror compliant labels included on physical bottles on virtual depictions of alcohol beverage products in the Metaverse.

6. **Underage Advertising.** For decades, brands have carefully selected the venues and wording of their advertisements to ensure compliance with rules limiting advertising to underage consumers. In the Metaverse, compliance may be more complicated as there is typically no central authority (such as a technology company) publishing reliable demographic data or prohibiting users below a certain age. Brands, distributors, and retailers will need to find other sources to determine with confidence that the Metaverse platforms or events where they are advertising do not appeal primarily to an underage audience.

7. **IP Protection and Enforcement.** When making products available in the Metaverse, alcohol brands will need to take steps to protect their intellectual property. See our previous Alert on Protecting and Enforcing IP Rights in the Metaverse for more detail.

Key Takeaways

The Metaverse poses a tremendous opportunity for alcohol beverage companies to connect directly with consumers in an interactive way that was considered science fiction just a few years ago. But like every new frontier, technological or otherwise, there are legal and regulatory hurdles to consider and overcome. Some are familiar, while others are novel. The lawyers in ArentFox Schiff's Beverage and Food practice offer a cross-disciplinary perspective to help producers, distributors, retailers, and their partners in the alcohol beverage industry come up with practical strategies to maximize the value of the opportunities created by the Metaverse.

CANNABIS

Launching Digital Dispensaries

Aram Ordubegian, Justin A. Goldberg, Jake Gilbert

Following in the footsteps of Californians, Coloradoans, Arizonans, and Bay Staters, denizens of the Metaverse can now step inside a cannabis dispensary and purchase cannabis products. Two cannabis brands have staked claims to their own Metaverse storefronts where they will sell products to real-life addresses in all 50 US states. Higher Life CBD and Kandy Girl each have acquired property in the Metaverse (in Cryptovoxels and Decentraland, respectively), where they are accepting customers interested in purchasing both digital items (like NFTs and Metaverse wearables) and real-life cannabis products.

Moving into the Metaverse both replicates mundane concerns faced by nearly all businesses (real estate, employee management, and customer relations) and opens up new regulatory gray areas, such as inconsistent state and federal law governing the advertising, marketing, sale, and possession of marijuana products. Both Higher Life CBD and Kandy Girl have styled their Metaverse storefronts as virtual dispensaries. While Kandy Girl attempts to avoid state laws outlawing the sale of cannabis by selling THC gummies (consisting of no more than .3 percent delta-9 THC, extracted from hemp), which are legal under federal law, some cannabis products, presently, can only be shipped in a limited numbers of states. For now, purchasers seeking cannabis products in states where cannabis sales are not legal are limited to CBD purchases only. However, as the tenor of state and federal law slowly shifts towards legalization, more states may become markets for cannabis products – and the brands already known to purchasers, digital or otherwise, will have an advantage once those sales are allowed.

Cannabis companies operating in the Metaverse can also use their digital storefronts to change their customer service operations. For instance, expert budtenders can provide advice to potential clients anywhere in the world, and display other products and strains that may suit the customers' wants and price ranges – all from the comfort of the clients' homes. Brands can also gather significant amounts of data on their customers and leverage that data into new offerings targeted to customer wants.

The Metaverse may ultimately serve as the great equalizer—granting smaller local brands the ability to compete with far more established brands, all through the power of the internet. Higher Life CBD is an Indiana company and Kandy Girl is owned by the Florida entrepreneur, but in the Metaverse they can be anyone's local dispensary.

For brands not yet in the Metaverse, now is a good time to think about expanding beyond your local footprint and claiming your spot in the digital marketplace. As large companies develop the Metaverse, they will seek to bring as many new eyeballs and new dollars to spend as exist on the internet. Being set up with a distinct Metaverse presence and open digital doors, will enable those new clients to start making their cannabis product purchases online, as soon as they are ready.

Nevertheless, before entering the Metaverse, cannabis companies should consider the individual advertising and marketing regulations of the particular states they operate in. In addition, they should consider carefully and review the specific terms of service or use of the particular Metaverse they plan to operate in. For instance, Sandbox's Terms of Use bans users from "[p]romoting any illegal activity or advocate, promote or assist any unlawful act" and Decentraland's Terms of Use state:

> "In the event that fraud, illegality … is connected with your account, a decentralized autonomous organization (DAO) may suspend or block your account."

Overall, while the Metaverse is a ripe target for cannabis companies to operate, market, and conduct customer service in, they should carefully consider the regulatory and operational environment of the particular Metaverse they plan to operate in, before potentially launching a virtual dispensary.

ENERGY & CLEANTECH

Ecosystem of Production & Consumption

Daniel J. Deeb, Alex Garel-Frantzen

The tremendous popularity of social networks and advances in virtual reality (VR) and distributed ledger technology are helping to usher in a new technological frontier: an emerging computer-generated universe often called Metaverse.

The Metaverse allows users to do almost everything they do in real life: run businesses, buy real estate and build virtual office spaces, sign and enforce contracts, interact with colleagues, trade artwork and other digital assets in the form of non-fungible tokens, and more. Central to the emerging Metaverse ecosystem is blockchain technology, decentralized public ledgers that record the ownership and sale of cryptographic assets, including non-fungible tokens that can represent parcels within a Metaverse, without the need for third-party intermediaries by using trustless consensus protocols.

Blockchain and Energy Usage

Because the proof of work (PoW) consensus protocols that underpin many of the most popular blockchains, including Ethereum and the Bitcoin mainnet, consume large amounts of energy, substantially more energy production will be necessary to sustain the growing Metaverse. For example, Intel estimated in December 2021 that our global computing infrastructure needs to be 1,000 times more powerful to sustain the Metaverse. And a recent study by the University of Cambridge concluded that if Bitcoin were a country, it would be in the top 30 energy users worldwide.

Corporate Responses to Blockchain Energy Uses

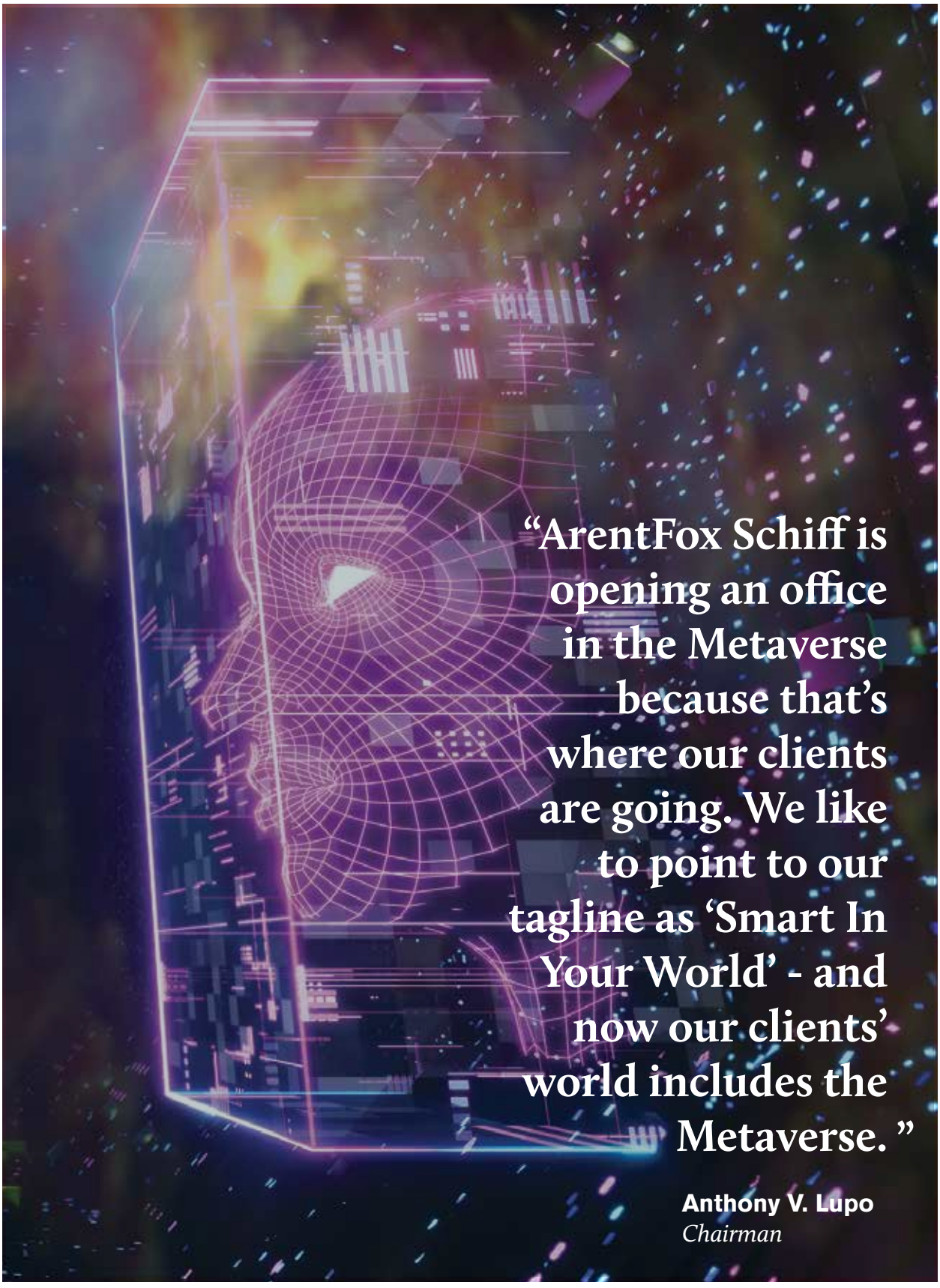
The energy demands of PoW blockchains have led many companies to consider how that energy is generated. For example, in 2021, Tesla suspended accepting vehicle purchases via Bitcoin because the company was "concerned about rapidly increasing use of fossil fuels for Bitcoin mining and transactions," adding that it would resume its use of blockchain technologies when mining shifted to more renewable energy sources.

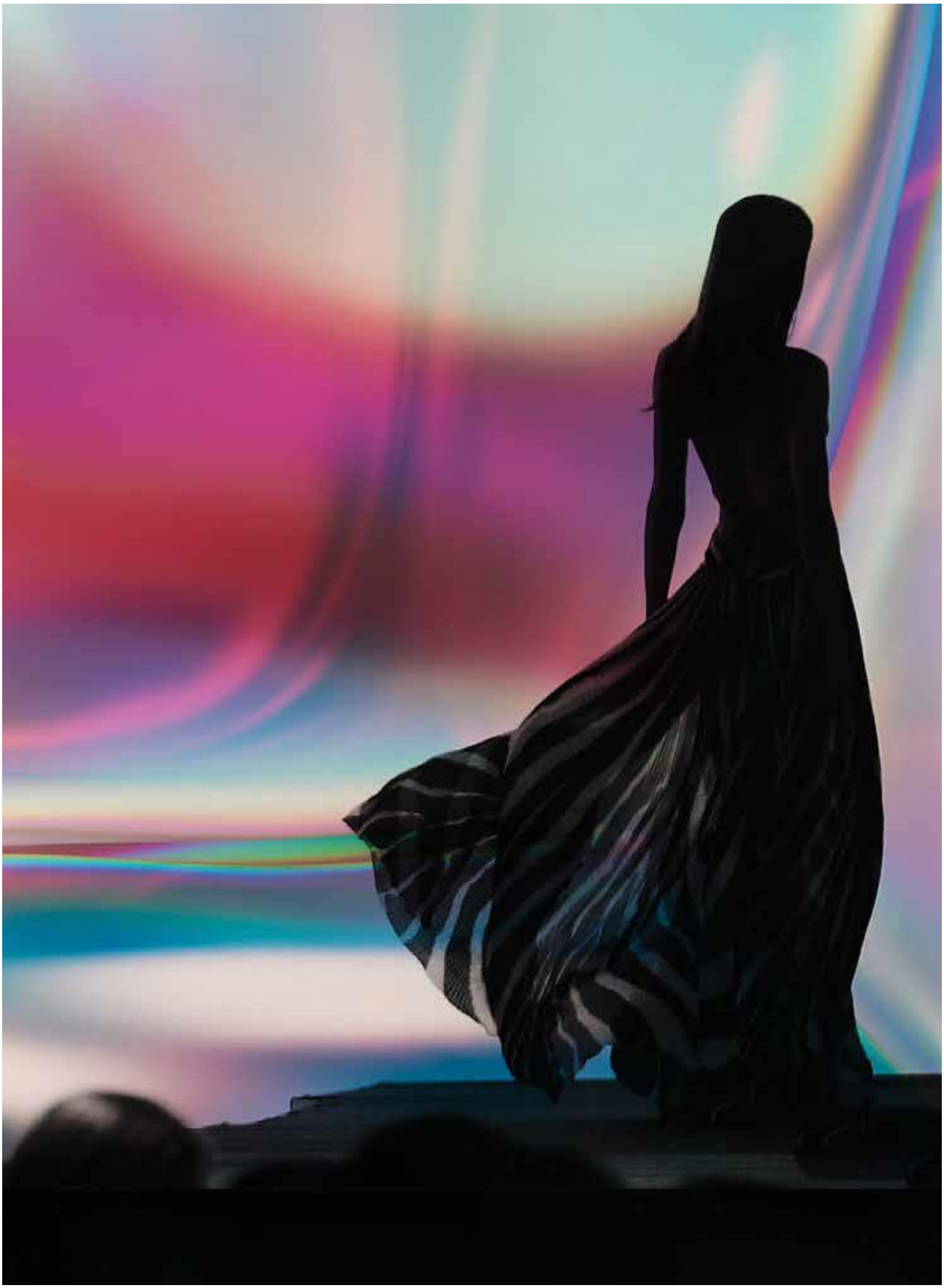
Some blockchain mining companies have made that shift to renewable energy, like Canadian-based Bitfarms, which powers 100 percent of its operations by hydroelectricity. Similarly, Google has committed to operating on carbon-free energy in all of its data centers by 2030. Microsoft also intends to be "carbon negative" by 2030, and Amazon Web Services has a goal of powering its operations with 100 percent renewable energy by 2025. Institutional investors may also drive the shift to renewable energy use as their investment decisions, including in digital assets, have been shaped increasingly by the consideration of environmental, social, and governance (ESG) factors, including energy use.

ENERGY & CLEANTECH

Perhaps with this increased renewable energy demand in mind, the US Energy Information Agency expects 62 percent of all new US electric generation capacity in 2022 to come from solar and wind. Concurrent with the development of new renewable energy sources, other companies are working to develop less energy intensive blockchain technologies, including so-called proof of stake consensus protocols that do not use mining to validate transactions.

ArentFox Schiff is a market leader in helping clients develop and operate renewable energy projects and operate in cutting-edge environments, such as the Metaverse. Please contact any member of ArentFox Schiff's Energy & Cleantech team regarding the environmental and energy impact of the Metaverse.


"ArentFox Schiff is opening an office in the Metaverse because that's where our clients are going. We like to point to our tagline as 'Smart In Your World' - and now our clients' world includes the Metaverse."
Anthony V. Lupo
Chairman



FASHION & RETAIL LAW

The Next Frontier?

Anthony V. Lupo, *Dan Jasnow*

The fashion industry is known for taking creative risks, so it is understandable that the industry is taking its next steps—literally—out of this world. Big name labels and innovative fashion start-ups are setting their sights on the so-called "Metaverse," a persistent, digital universe that transcends virtual borders and promises to be the next frontier of fashion, e-commerce, and advertising.

What Is the Metaverse?

The concept of the Metaverse can be traced back to science fiction author Neal Stephenson whose 1992 novel "Snow Crash" depicted an immersive, virtual reality-based successor to the Internet. And while this may still seem like little more than science fiction, the Metaverse is much closer to reality than most Americans realize.

For almost two decades, digital platforms like SecondLife and Entropia Universe have allowed users to immerse themselves in digital worlds where they can build communities, entertain themselves, and even earn money. Today, popular games like Fortnite, Roblox, and World of Warcraft are increasingly blurring the lines between virtual and non-virtual worlds, offering shared spaces and experiences that were previously only offered in person. Last year, for example, Fortnite hosted a digital concert with rapper Travis Scott that attracted more than 45 million viewers over five performances, while Roblox hosted a virtual concert experience with Lil Nas X that attracted more than 30 million viewers.

Growing numbers of consumers are also showing that they are prepared to spend big bucks on virtual goods and services. Despite being free-to-play, many of the most popular games today derive significant amounts of revenue by selling digital apparel, gear, loot, and other in-game perks. As the Federal Trade Commission (FTC) has noted, these microtransactions have become a multi-billion-dollar market.

While a true Metaverse that stitches together these various digital worlds is likely still a ways away, the technology arms race is well underway. Facebook announced this month that it has formed a new product team focused on the Metaverse, which will focus in part on "build[ing] the connective tissue between [digital] spaces." Meanwhile, Epic Games, the studio behind Fortnite, recently announced it raised $1 billion in funding to support its vision of the Metaverse. The growing number of virtual and augmented reality devices on the market will make it even easier for consumers to traverse the boundary between virtual and non-virtual reality.

Fashion Brands In the Metaverse

Big-name designers have already started to infiltrate the Metaverse, recognizing the enormous economic potential of digital goods. In one eye-catching example, a digital edition of a Gucci handbag ("Dionysus Bag with Bee") sold for more than $4,115 on Roblox, a price of almost $800 more than the "real" bag, which typically sells for $3,400. The virtual bag was an in-game accessory that had no value outside of Roblox.

Similarly, in what was billed as the "first-ever collaboration between a global eSport and a luxury fashion house," Louis Vuitton released a capsule collection for Riot Games' "League of Legends." The collection included pieces ranging in price from a $170 bandeau to a $5,600 leather jacket. Louis Vuitton also designed "skins" (i.e., outfits) that players could purchase for their characters for approximately $10 each.

In another collaboration, the video-game streaming service Twitch streamed the Burberry Spring/Summer 2021 show from London Fashion Week, drawing approximately 42,000 concurrent viewers.

And it is not just the traditional fashion houses: virtual-only fashion houses are popping up as well. DressX, which produces digital fashion, recently raised $2 million in a seed round, while virtual shopping platform Obsess recently raised $13.4 million in Series A funding, one of many examples pointing to the influx of investing in virtual retail experiences.

Like any form of advertising, tapping into the Metaverse allows brands to reach audiences they otherwise might not and to connect with consumers in a medium where they are likely to be engaged, attentive, and spending a significant amount of time and money.

Legal Considerations

While it offers a great opportunity for brands, the Metaverse also presents complex legal questions for companies, particularly with respect to intellectual property. As many companies have learned, protecting and enforcing intellectual property rights on social media and digital marketplaces is often like a game of "whack-a-mole," requiring active monitoring and enforcement programs, coordination with platform providers, and sometimes a court order to obtain the true identity of the online infringer. Developing similar programs for digital platforms as expansive as the Metaverse will be a challenge.

Trademark and copyright licensing will also have to be reassessed. Brands should consider whether license agreements, particularly exclusive license agreements, need to include carveouts for the Metaverse or other digital-only uses. Similarly, brands may need to re-evaluate franchise agreements to ensure that, for example, sales of digital apparel in the Metaverse by one franchisee will not violate the territorial rights of another franchisee.

Content creators may also have difficulty defining or restricting the territory of copyright licenses. Currently, the rights in and to TV shows, movies, music, and other creative works are typically doled out by territory, with viewers or users restricted by technologies like geofiltering. It's not clear whether such location-based technologies will function in the Metaverse. If not, content creators will need to consider how to rethink rights ownership in the new digital frontier.

Brands may also have to reevaluate the relative strength of their trademark rights. Trademark rights are based largely on the territory or jurisdiction in which the marks are used and/or registered. Just as the Internet has helped obscure national borders, the Metaverse could erase them altogether, making it difficult to assess the location of the trademark use, whether yours or that of a possible infringer.

In the meantime, how can brands protect their digital assets? One solution may be to rely on Non-Fungible Tokens (NFTs). An NFT is similar to a unique serial number, certifying that a digital asset is unique. Just as a serial number can be physically stamped or imprinted on a physical good, an NFT is stored on a digital ledger called a blockchain, where information about the digital asset can be verified and authenticated. The value of NFTs and digital assets largely stems from the idea of scarcity and originality, allowing collectors to own unique digital assets like art, apparel, songs, or viral videos. By certifying that a particular digital asset is original, NFTs could help fashion brands verify whether digital apparel is real or counterfeit and help enforce restrictions or limitations on resale. Consumers, meanwhile, could use NFTs to verify that digital apparel is authentic before they purchase it.

Takeaways

Although there is great uncertainty as to how the Metaverse will play out, one thing is for certain: the Metaverse is coming, and it will likely change the fashion industry and e-commerce as we know it. High-profile brands have already begun to make an impact in the space, and those who wait may be left behind, losing the opportunity to reach a vast, engaged, and diverse customer base.

ArentFox Schiff is one of the premier US law firms representing fashion and design houses, apparel manufacturers and retailers, and luxury goods companies.

FINANCE

Financial Regulation, Monetary Policy, and the Metaverse?

Richard J. Krainin, Jerome Shuman Jr.

The Metaverse is an emerging, digital environment that will allow users to do almost everything they do in real life, e.g., run businesses, buy real estate, enter into contracts, and socialize, albeit in a virtual setting. It is often described as the next, natural iteration of the current internet. As an ideal, it is a seamless convergence of our physical and digital lives.

Metaverse Markets, Transactions, and Tokens

Though the Metaverse is in its infancy, it is growing rapidly, and a dynamic economic ecosystem is forming and evolving. At the center of this ecosystem is blockchain technology: decentralized, tamper-proof public ledgers that record the ownership and sale of cryptographic assets, including fungible tokens like cryptocurrencies, which are identical to each other and, therefore, can serve as a medium for commercial transactions, and non-fungible tokens (NFTs), which have unique identification codes and metadata that cannot be replicated, thus distinguishing them from one other. Because each NFT is uniquely identifiable, NFTs can act as a digital representation of real-world, tangible assets like artwork, real estate, identities, and more; "tokenizing" real-world assets makes buying, selling, and trading them more efficient, while reducing the probability of fraud.

As the Metaverse matures, there will be increased convergence between the online and offline worlds and the further development of physical-to-virtual payments and financing, with the potential for new ownership and asset classes, for example, virtual mortgages on Metaverse real estate.

With these characteristics, there are opportunities in every market area to develop and build the industries, marketplaces, and products that are consumed in the virtual world. It should come as no surprise, then, that ArentFox Schiff has already advised several household brands on developing a presence in the Metaverse before becoming the first major law firm in the country to join as well by acquiring a site in Decentraland, a purely digital world in which users can buy digital plots of land.

Central Bank Digital Currencies

With the evolution of "metanomics" and a corresponding increase in the number of people utilizing digital assets within the Metaverse, discussions around regulation and stabilization of this digital world have also increased. The US Federal Reserve recently announced that it is seeking public input as part of a discussion on the potential benefits and risks of central bank digital currencies (CBDC), including one issued and backed by the US central bank. While Americans have long held money in digital form—for example, in a commercial bank account recorded as entries on digital bank ledgers—a CBDC would differ, because as central bank money, it would be a liability of the Federal Reserve, not of a commercial bank. Central bank money serves as the foundation of the financial system and the overall economy. It carries neither credit nor liquidity risk, and is therefore considered the safest form of money.

As the Federal Reserve discusses in its digital currencies white paper, a CBDC could potentially offer a range of benefits: expanded access to a convenient form of central bank money with its attendant features of safety, liquidity, and access; new platforms on which to create innovative financial products and services; and faster and cheaper payments, including across borders.

A CBDC could also pose certain risks and would raise a variety of important policy questions, including how it might affect financial-sector market structure, the cost and availability of credit, the safety and stability of the financial system, and the efficacy of monetary policy.

The Federal Reserve does not plan to take any imminent decisions on a CBDC. Per its white paper, it would only consider developing a CBDC if it finds (i) a CBDC is the best way to provide the aforementioned benefits to households, businesses, and the overall economy, (ii) such benefits will exceed the potential risks, and (iii) the existence of broad public and cross-governmental support. As a part of that consideration, the Federal Reserve is seeking public feedback on a range of topics related to CBDC and welcomes comments from all stakeholders here.

Though the Federal Reserve's endorsement of a CBDC would exponentially broaden the adoption of metanomics, financial services are wasting no time in exploring opportunities in the Metaverse. For example, JPMorgan Chase has set up a virtual lounge in Decentraland to much publicity. Other large asset managers such as American Express, Mastercard, and US Bank are also beginning to dip their toes into digital currencies and virtual platforms.

As these large financial institutions increase their presence in these new worlds, regional and mid-market financial players should also begin to think about how best to reach and serve these virtual markets.

ArentFox Schiff will continue to monitor, evaluate and explore opportunities and challenges across the Metaverse ecosystem, bringing to bear our combined capabilities in emerging technologies, finance, government regulation, and oversight to provide our clients with crisp insight into these cutting-edge markets.

Please contact any member of ArentFox Schiff's Finance team regarding the potential impacts of the Metaverse on commercial finance and market economies.

HEALTH CARE

Greater Interactivity & Immersion

Douglas A. Grimm, Gayland O Hethcoat II

The Metaverse is widely regarded as the next frontier in digital commerce, with businesses across all industries spending millions of dollars to acquire a digital presence for positioning as market leaders. While it offers transformational opportunities, the Metaverse also presents unique legal challenges. We highlight a few key legal issues stakeholders in the health care industry should consider before entering the marketplace.

Overview of the Metaverse

At its core, the Metaverse is the next generation of the internet, promising immersive, 3D experiences with vibrant digital marketplaces and a strong social component. In these marketplaces, businesses and consumers typically transact using cryptocurrencies—digital forms of exchange that are distributed within a decentralized system using secure cryptographic methods—and non-fungible

tokens (NFTs)—unique digital properties that are created, or "minted," from real-world objects or creations, such as art and music, in exchange for cryptocurrency or other NFTs. Facilitating these transactions are blockchains—digital ledgers that record transactions between two parties efficiently and in a verifiable and permanent way. While some elements of the Metaverse remain aspirational, businesses and consumers have begun flocking to Metaverse platforms and spending significant sums on the acquisition of digital assets.

The Business Case for the Health Care Industry

Health care providers are well-positioned to establish a foothold in the Metaverse, building from the technological advances that are already evident across the health care sector. Artificial intelligence (AI), for example, is facilitating a more rapid and accurate review and translation of mammograms, minimizing unnecessary biopsies to detect breast cancer. Virtual reality (VR) is providing surgeons with three-dimensional imagery to plan and perform surgeries, and is giving physical therapists access to game-based therapies to engage and speed up recovery for stroke patients. For their part, patients are becoming increasingly accustomed to wearable devices, apps, and other technologies that provide real-time analytics and recommendations to promote informed health decision-making.

During the COVID-19 pandemic, the health care industry made tremendous advances in growing its digital footprint, as usage of telehealth and other virtual modalities of care significantly expanded among providers and patients. A 2021 report by McKinsey & Company found that telehealth utilization has increased to stable levels that are 38 times higher than pre-pandemic levels, with utilization rates now ranging from 13 percent to 17 percent across medical specialties. Meanwhile, the entry of tech companies, venture capital firms, and other non-traditional industry actors into the health care sector has contributed to substantial growth in virtual care investments. As the McKinsey report noted, total venture capital investment in the digital health space in the first half of 2021 was $14.7 billion—more than all such investments in 2020 and nearly doubled the total investments in 2019.

The Metaverse could massively accelerate these trends, offering a much more immersive and interactive experience than traditional telehealth has afforded. With the combined power of ever more sophisticated AI, VR, and other innovations, including augmented reality, the Internet of Things (IoT), quantum computing, and robotics, the Metaverse could potentially enable:

- A physician to conduct a consultation through the projection of a three-dimensional hologram of the physician to a patient or physician at another location.
- A digital "twin" of a patient to be created and mapped, using genetic and other data about the patient, to predict the potential short-term and long-term complications the patient may experience from surgery or other treatments.
- Students and trainees to participate in an educational environment in which they are virtually embedded in an operating room to observe surgical procedures.
- The use of blockchains to break down barriers across electronic health record systems and enable rapid, secure sharing of health information between providers and patients.

To these ends, the Metaverse could potentially improve the quality of care and, in turn, the health outcomes of individual patients. It could also potentially create efficiencies that decrease the costs and expand access to care.

Despite the many uncertainties that exist, for now, some health care industry stakeholders are preparing for their future in the Metaverse. Earlier

this year, for example, CVS was noted as the first pharmacy to file for a trademark for the sale of goods and services in the Metaverse. The filing described the company's ambitions to provide downloadable prescription drugs for use in online virtual worlds and various types of health care services, such as non-emergency medical treatment services and nutrition counseling, in virtual reality and augmented reality environments.

Legal Considerations

Before entering a Metaverse platform, health care providers and professionals should consider the following:

1. **Custody of Digital Assets.** Because of their digital character, digital assets such as cryptocurrency and NFTs are uniquely vulnerable to loss and theft. Before acquiring cryptocurrency or NFTs, providers should set up a secure blockchain wallet and adopt appropriate access and security controls.

2. **Dedicated Legal Entity.** Providers should consider creating a subsidiary or affiliate to hold digital assets, shield other parts of their business from Metaverse-related liability, and address potential taxation issues.

3. **Selecting a Platform.** Each Metaverse platform has its advantages and disadvantages. Some, including Roblox and Fortnite, offer access to a greater population of users but generally give businesses less control over content within the platforms. Others, such as Decentraland and the Sandbox, provide businesses with greater control but smaller audiences and higher barriers to entry. No dominant platform has yet emerged that is specifically designed for interactions involving health care providers. As current platforms compete for new entrants from various industries and occupations, providers should consider the optimal amount of control and visibility they wish to maintain when committing to a particular platform.

4. **IP Registration.** CVS's recent trademark filing underscores that providers should consider filing trademark applications covering core Metaverse goods or services and securing any available blockchain domains in order to facilitate Metaverse payments. Trademark protection should also extend to providers' individualized Metaverse presence. Given the accelerating adoption of blockchain domains along with limited dispute resolution recourse available, providers should consider securing intellectual property rights now.

5. **IP Protection and Enforcement.** The decentralized nature of the Metaverse poses a significant challenge to businesses and intellectual property owners that are used to having predictable enforcement mechanisms to protect their legal interests. Before proceeding with blockchain-based transactions, including purchasing or minting NFTs, providers need to understand that content recorded on a blockchain is there permanently and cannot be deleted. Restrictions on the use and resale of an NFT must be carefully considered and implemented prior to minting because once the content is on the blockchain, there is little recourse.

6. **Reserving Metaverse Rights.** Businesses that license their intellectual property, particularly those that do so on a geographic or territorial basis, should review existing license agreements to determine what rights, if any, their licensees maintain for Metaverse-related uses. Moving forward, brand owners should expressly reserve their rights for Metaverse-related uses and exercise caution before authorizing any third party to deploy the brand owner's intellectual property on the brand owner's behalf.

In addition to these considerations, health care providers will face unique legal issues in the Metaverse as they navigate the complex health care regulatory framework. Questions that will likely

arise include:

- How will traditional state-based licensure requirements apply to providers in their Metaverse interactions with patients and other providers who are physically located in other states and countries?
- Is blockchain technology conducive to the sharing of health data with patients and other providers in the Metaverse in a manner that complies with federal and state data privacy and security requirements?
- Will governmental and commercial payor programs cover products and services in the Metaverse, and how will fraud and abuse laws and other regulatory requirements apply to providers in the Metaverse who are enrolled in those programs?

Variations of these questions emerged during the COVID-19 pandemic as providers pivoted quickly to telehealth in their efforts to maintain continuity of care while mitigating transmission of the virus. This pivot was enabled in large part by regulatory waivers and relaxed enforcement of federal and state legal requirements that otherwise could have hindered such a quick scaling of the virtual care infrastructure in the United States. Even as COVID-19 appears to be evolving from a pandemic to an endemic phase, many of these regulatory flexibilities remain in place, raising concerns about whether the gains in digital health will be eroded if and when these flexibilities terminate. How policymakers, regulators, and industry stakeholders address these concerns in the long term is important not only to current telehealth and digital health trends that accelerated during the pandemic but also to the regulatory paradigm that could develop in the Metaverse.

Key Takeaways

The Metaverse poses a tremendous opportunity for health care providers to connect with patients and other providers and businesses in an interactive way that was considered science fiction just a few years ago. But like every new frontier, technological or otherwise, there are legal and regulatory hurdles to consider and overcome. Some are familiar, while others are novel. ArentFox Schiff's attorneys provide a multi-disciplinary approach to advising industry stakeholders in the development of practical strategies that maximize the value of the Metaverse's opportunities.

HOSPITALITY

The Guest Experience Enhanced

Charles B. Ferguson, Jr., *Kimberly A. Wachen*

The Metaverse, regarded by many as the next frontier in digital commerce, does not on its surface appear to offer many benefits to an industry with a core mission of providing a physical space for guests to use and occupy. However, there are many opportunities that the Metaverse may offer to owners, operators, licensors, managers, and other participants in the hospitality industry that should not be ignored.

What is the Metaverse?

The Metaverse is a term used to describe a digital space that allows social interactions, frequently through use of a digital avatar by the user. Built largely using decentralized, blockchain technology instead of centralized servers, the Metaverse consists of immersive, 3D experiences, persistent and traceable digital assets, and a strong social component. The Metaverse is still in its infancy, so many of the uses for the Metaverse remain aspirational; however, Metaverse platforms have already seen a great deal of activity and commerce. Meanwhile, technology companies are working to produce the next-generation consumer electronics that they hope will make the Metaverse a more common location for commerce.

The Business Case for the Hospitality Industry

The Metaverse is widely regarded as one of the top emerging trends in technology. Gartner estimates that 25 percent of consumers will spend an hour a day in the Metaverse by 2026. Investors are taking note, with Bloomberg estimating that the Metaverse market was worth $478.7 billion in 2020 and predicting that the market would be worth nearly $800 billion by 2024. As its popularity grows, the Metaverse will undoubtedly become an important location for the hospitality industry to interact with and market to its customer base.

The hospitality industry may find the Metaverse useful in enhancing both marketing and guest experiences. A recent McKinsey & Company survey found that 60 percent of consumers preferred that at least some portion of their usual activities be performed virtually. The main drivers of those preferences were connectivity with people, exploring digital worlds, and the ability to meet and collaborate remotely with colleagues.

Immersive virtual tours of hotel properties and the surrounding area would satisfy the desire to explore the world digitally, allowing potential customers to explore all aspects of the property and its surroundings before booking. In conjunction with these tours, operators may also add additional booking options or promotions within the virtual tour to increase exposure to customers. At least one online travel agency has already announced plans to offer travel experiences and tours virtually in the Metaverse starting in the fall of 2022, with the potential to link such online experiences with real world travel options,

Additionally, creating hybrid, in-person, and remote events, such as conferences, weddings, or other celebrations, would allow guests on-site and consumers off-site to interact with one another for an integrated experience; one that might drive new revenue streams. The same McKinsey & Company survey found of those that listed virtual activities as a preference, 78 percent cited attending virtual events as a preference.

Legal Issues to Consider

1. **Select the Right Platform For You.** There are multiple Metaverse platforms and they all have tradeoffs. Some, including Roblox and Fortnite, offer access to more consumers but generally give businesses less control over content within the programs. Others, such as Decentraland and the Sandbox, provide businesses with greater control but smaller audiences and higher barriers to entry. Each business should consider who its target audience is, what platform will be best to reach that audience, and its long term Metaverse strategy before committing to a particular platform.

2. **Register Your IP.** Businesses should consider filing trademark applications covering core Metaverse goods or services and securing any available blockchain domains, which can be used to facilitate Metaverse payments and to direct users to blockchain content, such as websites and decentralized applications. Given the accelerating adoption of blockchain domains along with limited dispute resolution recourse available, we strongly encourage

businesses to consider securing intellectual property rights now.

3. **Establish A Dedicated Legal Entity.** Businesses may want to consider setting up a new subsidiary or affiliate to hold digital assets, shield other parts of their business from Metaverse-related liability, and isolate the potential tax consequences.

4. **Take Custody of Digital Assets.** Because of their digital character, digital assets such as cryptocurrency, which may be the primary method of payment in the Metaverse, are uniquely vulnerable to loss and theft. Before acquiring cryptocurrency, businesses will need to set up a secure blockchain wallet and adopt appropriate access and security controls.

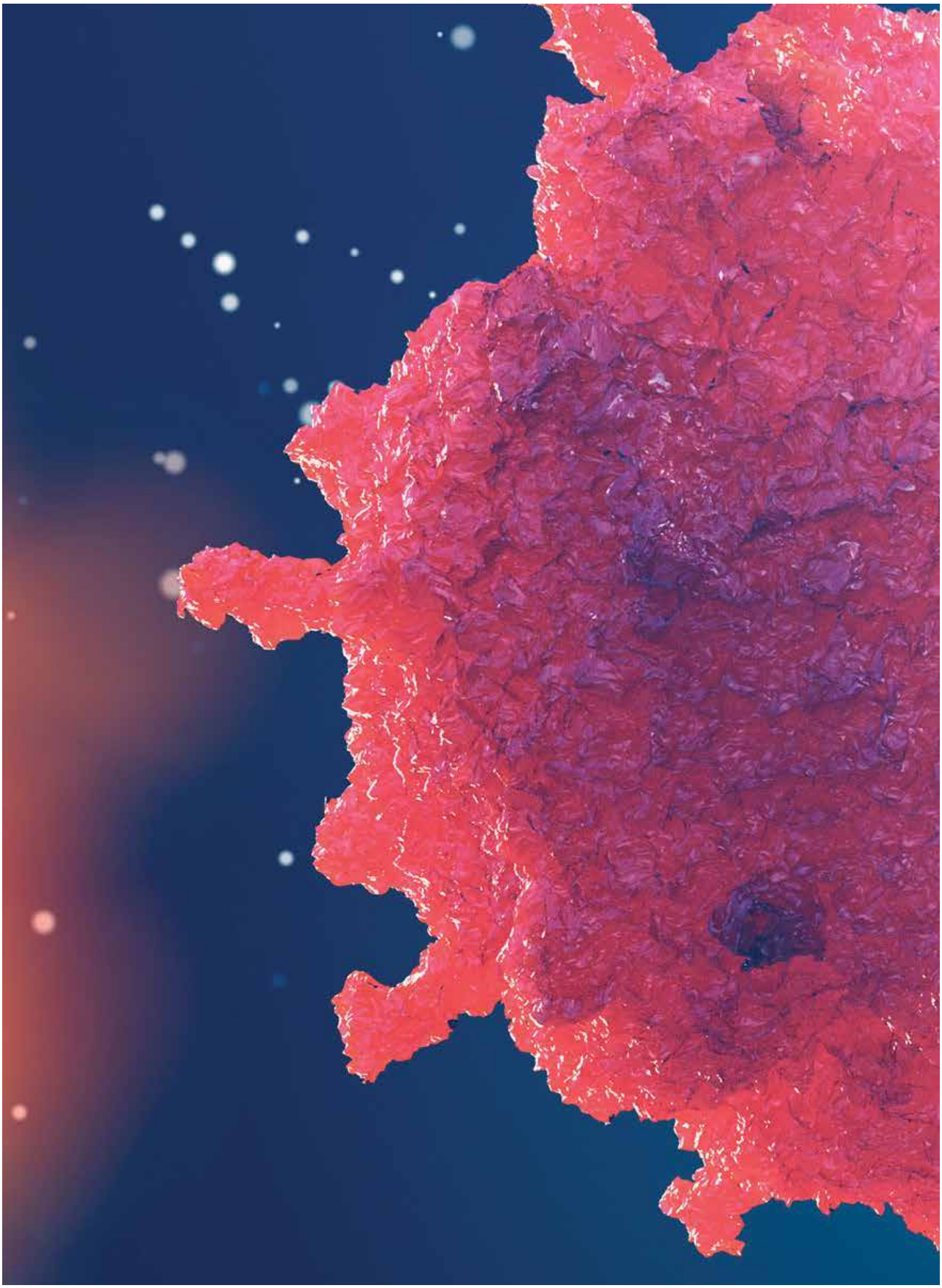
5. **Protect and Enforce Your IP.** The decentralized nature of the Metaverse poses a significant challenge to businesses and intellectual property owners. Avenues for enforcing intellectual property rights in the Metaverse are constantly evolving and may require multiple tools to stop third-party infringements.

6. **Reserve Metaverse Rights.** Each business that licenses its IP, particularly those that do so on a geographic or territorial basis, should review existing license agreements to determine what rights, if any, its licensees have for Metaverse-related uses. Moving forward, each brand owner is encouraged to expressly reserve rights for Metaverse-related uses and exercise caution before authorizing any third party to deploy IP to the Metaverse on a business' behalf.

7. **Tax Matters.** Attention needs to be paid to how the tax law applies to Metaverse transactions, despite the current tax law not fully addressing the Metaverse. This is particularly the case for state and local sales and use, communications, and hotel taxes.

Ready to Enter?

As we move into the future, the Metaverse appears poised to provide a tremendous opportunity for the hospitality industry to connect directly with consumers in an interactive way that was until recently considered science fiction. But like every new frontier, technological or otherwise, there are legal and regulatory hurdles to consider and overcome. Some are familiar, while others are novel. The lawyers in ArentFox Schiff offer a cross-disciplinary perspective to help owners, operators, licensors, managers, and other participants in the hospitality industry develop creative and pragmatic strategies to maximize the value of the opportunities created by the Metaverse.



LIFE SCIENCES

Drug Development

Sailesh K. Patel, Matthew T. Wilkerson

"Metaverse" is no longer a mere buzzword. Many industries are discovering and developing applications for the Metaverse, and the pharma and biotech industry is no different.

The many ways the Metaverse will change life sciences is not yet fully understood, but significant research and development is underway to utilize the Metaverse and its associated technologies for a wide variety of life science applications. We discuss how the Metaverse may transform the drug development process, medical device development, and the legal and regulatory challenges that will need to be addressed.

What is the Metaverse?

The Metaverse is a digital environment implementing virtual (VR) and augmented-reality (AR) where users can interact with one another, run experiments, and transition between the physical world and the virtual realm. In simpler terms, a fully immersive internet.

Drug Development in the Metaverse

$1.4 billion USD: this is the mean investment required to bring a new medicine to market according to a 2020 Journal of American Medical Association (JAMA) study. One of the most costly and time-consuming stages of drug development is to design, staff, and run clinical trials. Clinical trials can comprise about 60 percent of the total cost to bring a new treatment to market. It takes a lot of time and resources to recruit a sufficient number of clinical trial subjects who have the appropriate disease, genetic, gender, age, and other characteristic profiles needed for a clinical trial.

The Metaverse introduces the amazing possibility of using digital twins to starkly reduce the cost and time required to run reliable clinical trials. A digital twin is a virtual model designed to accurately reflect physical objects, processes, or even a real-world person. Digital twins can "run any number of useful simulations in order to study multiple processes." Using a digital twin would allow the experiment or trial to be run and studied much more quickly and safely. Moreover, unlike a conventional data analytics program, the Metaverse would allow for an immersive or AR visual representation of the effects of the proposed therapy on a digital twin, which could be an entire person, or specific organs and systems. Such a visual three-dimensional and interactive representation would be more user-friendly and likely more informative to a clinical researcher.

Although the technology to create an exact digital twin of a human individual is not yet developed, pharmaceutical companies are actively exploring this technology. When that technology is actualized, pharmaceutical companies will be able to complete clinical trials at a fraction of the cost and as quickly as a few weeks, rather than months or years.

Legal and Regulatory Challenges

While the Metaverse provides promising opportunities for improving drug development, legal and regulatory challenges remain. Because the technology is still developing, the details of the FDA regulations remain unknown. But the FDA has already begun working on potential regulations for this new frontier, and the use of digital twins in clinical trials is the biggest open question.

The FDA has already shown a willingness to implement computer-aided simulations in the drug development process through its Model-Informed Drug Development (MIDD) Pilot Program. The MIDD was designed to determine how quantitative modeling can be used to balance the risks and benefits of drug product development, particularly in dose selection or estimation studies, clinical trial simulations, and predictive safety evaluations. The FDA's embrace of modern data analytics and statistical modeling is a promising sign for the deployment of digital twins.

Additionally, the FDA's recent requests for public comment on medical devices with Metaverse technologies and its partnership with Siemens regarding digital twins in medical device development demonstrate the agency's commitment to improve product review processes with Metaverse technologies. The FDA provided nearly $2 million to Siemens for a pilot program to show how digital twins could improve product quality, development, and commercialization. Siemens and other companies are focused on using digital twins to enable more efficient use of resources. While the current pilot program with the FDA is focused on medical devices, Siemens aims to demonstrate how digital twins could also be used for biologics and pharmaceuticals. The project is also likely to assist the FDA to improve industry guidance and regulatory tools, and prepare for new development and manufacturing processes.

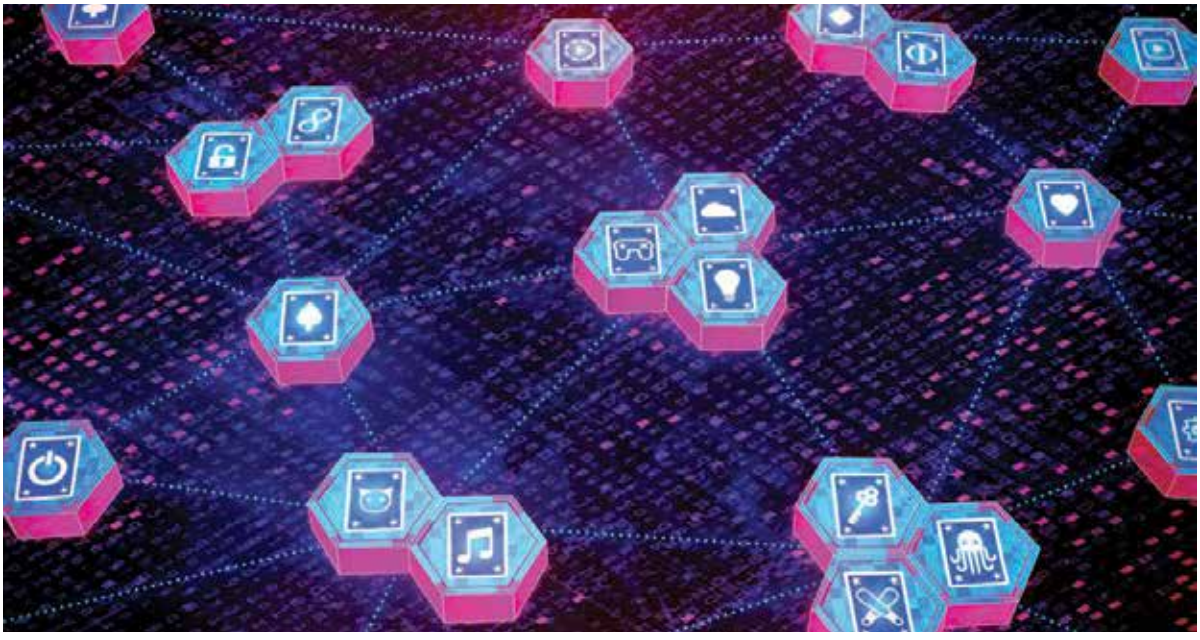
At least one product using Metaverse VR technology has already been approved by the FDA. EaseVRx, is an immersive VR system that uses behavioral therapies to help with pain reduction. The EaseVRx system has a VR headset, a controller and a "breathing amplifier" that directs the patients breath toward the headset's microphone for deep breathing exercises. This Metaverse treatment was granted the "Breakthrough Device Designation" by the FDA, which allows for a prioritized review. The FDA approval of EaseVRx demonstrates that the use of the Metaverse virtual environment to treat certain conditions is an area with a good likelihood of obtaining FDA approval. Approval of drugs or therapies that are shown to be safe and effective through clinical trial data obtained from digital twins is an area that may take longer to be blessed by the FDA. But as the pilot program with Siemens illustrates, using digital twins for clinical trials, is not mere fantasy.

The attorneys at ArentFox Schiff are maintaining a close watch on the developments of Metaverse technologies in the life sciences industry and the FDA's guidance and regulations related to such technology. ArentFox Schiff's multidisciplinary expertise in the life sciences industry, including regulatory, intellectual property, corporate, data privacy, and product liability issues facing the industry, allows us to provide clients holistic advice as they work to develop and implement Metaverse technologies.

NONPROFITS & ASSOCIATIONS

An Interactive Pursuit of Mission

Sean W. Glynn, *Brian D. Schneider*



The Metaverse is widely regarded as the next frontier in digital commerce, with organizations spending millions of dollars securing a presence by buying digital real estate and investing in platforms to be market leaders. While it offers clear opportunities for nonprofits, the Metaverse also presents distinct legal challenges. We highlight a few key legal issues nonprofits should consider before making the leap into the Metaverse.

What is the Metaverse?

At its core, the Metaverse is the next generation of the Internet. Built largely on decentralized, blockchain technology instead of centralized servers, it consists of immersive, 3D experiences with vibrant digital marketplaces, persistent and traceable digital assets, and a strong social component. While some elements remain aspirational, consumers are already flocking to Metaverse platforms and spending significant sums on digital assets. Meanwhile, many tech companies are working on next-generation consumer electronics such as smart glasses that they hope will take e-commerce to the next level and make today's two-dimensional web browsing a thing of the past.

The Business Case for the Nonprofit Sector

The Metaverse offers remarkable opportunities for the nonprofit sector:

- Membership organizations can hold their annual meetings wholly within the Metaverse.
- Educational institutions can offer virtual campus tours, admissions interviews and conduct the entire enrollment process through this medium.
- Think tanks can present white papers and hold real-time symposia.
- Cultural institutions can curate exhibits and provide performances—for free or for an admission charge.
- Fundraising can become more efficient generally and more creative using new development tools like non-fungible tokens (NFTs).

Before making a leap into a Metaverse platform, nonprofits should consider these issues:

1. **Register Your Intellectual Property.** Nonprofits should consider filing trademark applications covering core Metaverse goods or services and securing any available blockchain domains, which can be used to facilitate Metaverse payments and to direct users to blockchain content, such as websites and decentralized applications. Reminiscent of the rush in the 90's to secure various "dot-com" names, many organizations are filing as a defensive measure while their leadership deliberates how their institution should interact with the Metaverse. Given the accelerating adoption of blockchain domains along with limited dispute resolution recourse available, we strongly encourage nonprofits to consider securing intellectual property rights now.

2. **Protect and Enforce Your IP.** The decentralized nature of the Metaverse poses a significant challenge to intellectual property owners. Before proceeding with blockchain-based transactions, businesses need to understand that content recorded on a blockchain is there permanently and cannot be deleted. Restrictions on use and resale of an NFT must be carefully considered and implemented prior to minting because once the content is on the blockchain there is little recourse. In addition, nonprofits must understand how others may suborn their identity or trademarks. Many nonprofits are considering proactive steps to monitor and ensure that their intellectual property is not pirated.

3. **Reserve Metaverse Rights.** Institutions that license their IP, particularly those that do so on a geographic or territorial basis, should review existing license agreements to determine what rights, if any, their licensees have for Metaverse-related uses. Moving forward, we encourage nonprofits to expressly reserve rights for Metaverse-related uses and exercise caution before authorizing any third party to deploy your IP to the Metaverse on your behalf.

4. **Take Custody of Digital Assets.** Because of

their digital character, digital assets such as cryptocurrency and NFTs are particularly vulnerable to loss and theft. Before acquiring cryptocurrency or NFTs, organizations will need to set up a secure "blockchain wallet" and adopt appropriate access and security controls.

5. **Establish A Dedicated Legal Entity.** Institutions may want to consider setting up a new subsidiary or affiliate to hold digital assets, shield other parts of their operations and endowment from Metaverse-related liability, and deal with potential tax consequences.

6. **Select the Right Platform.** There are multiple Metaverse platforms with different benefits and detractions. Some, including Roblox and Fortnite, offer access to more consumers but generally give less control over content within the programs. Others, such as Decentraland and the Sandbox, provide greater control but smaller audiences and higher barriers to entry. Organizations should consider who their target audience is and their long term Metaverse strategy before committing to a particular platform.

Other Nonprofit Concerns

The unique nonprofit perspective to new technology has triggered some additional concerns:

1. **Stability.** Many Boards of Trustees are curious whether the Metaverse is a "passing fad" and not worthy of attention. All experts agree that the Metaverse is a natural evolution of the Internet and is here to stay. While some platforms may become obsolete (remember AOL? Netscape?), the Metaverse will continue to develop and improve.

2. **An Environmentally Friendly Platform.** Much has been written about the energy consumption of a blockchain-based transaction. While the energy consumption is considerable, it is still a vast improvement over current practices. For instance, a cryptocurrency exchange employs much less energy that the process of preparing, authorizing, sending, confirming and booking a wire transfer. And Metaverse transactions are still nascent. Energy efficiency is a primary consideration in the improvements currently evolving.

Ready To Enter?

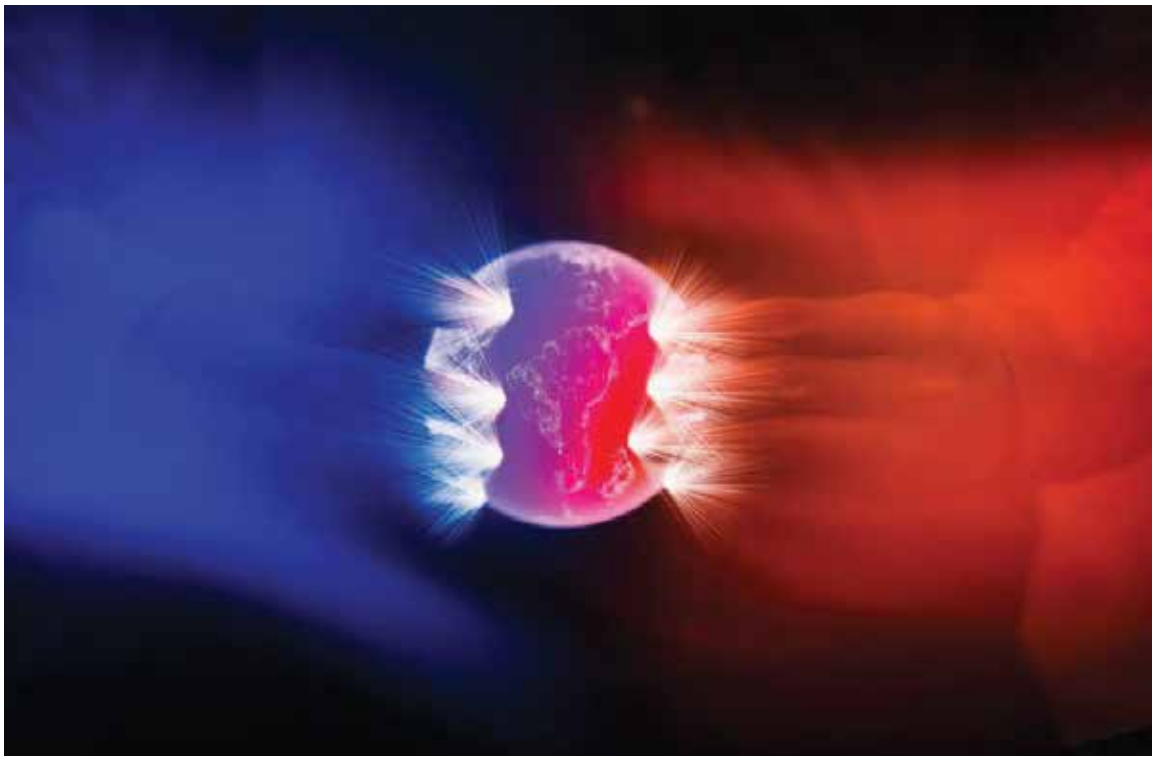
The Metaverse poses a tremendous opportunity for nonprofits to perform their mission in a new, innovative and interactive way that was considered science fiction just a few years ago. But like every new frontier, technological or otherwise, there are legal hurdles to consider. Some are familiar, while others are novel. ArentFox Schiff offers a cross-disciplinary perspective to help nonprofits and their partners come up with practical strategies to take advantage of the opportunities created by the Metaverse.

NONPROFITS & ASSOCIATIONS

Key Considerations for Trade Associations

Brian D. Schneider, Jerome Shuman Jr., Shantazia J. Nash

The Metaverse offers broad opportunities for trade associations to expand their reach and enhance member experiences like never before. These new and exciting possibilities, however, come with unique challenges. We highlight a few key benefits and hurdles trade associations may consider before leaping into the Metaverse.



Business Opportunities for Trade Associations

Trade associations are uniquely positioned to benefit from all the Metaverse offers. A core value for trade associations is their place as professional hubs for member development, networking, education, and product ideation. Most importantly, trade associations serve as sounding boards establishing industry best practices. The Metaverse creates an opportunity for further reach, stronger collaboration, and more effective evolution by trade associations within a space where the typical physical limitations are largely removed.

With this in mind, we have identified the following ways by which trade associations may be able to leverage the Metaverse:

Education. Within Metaverse spaces, trade associations can curate environments that allow their leaders and members to engage in interactive problem-solving sessions that mimic in-person experiences. Associations may communicate new or established practices more effectively with members who can join virtual conferences, presentations, and other educational events from anywhere in an immersive environment. The best part of the Metaverse is that ideas can be exchanged and developed in ways that less interactive mediums like webinars or simple, mass emails cannot achieve.

Trade Shows. Trade associations have learned to pivot to more virtual environments throughout the COVID-19 pandemic. The Metaverse, however, is an enhanced, virtual experience that combines the best parts of virtual and in-person environments. With these capabilities, trade associations may consider moving trade shows to the Metaverse to create augmented experiences for attendees where participants can showcase product prototypes, share resources, and continue connecting organically. Further, trade associations might find new incentives exist for participating member businesses aiming to gain new customers at trade shows. Members could unleash greater reach and revenue potential when the usual limits of space and access are removed from the Metaverse experience.

Member Connection and Mentoring. Perhaps the most exciting aspect of the Metaverse is the ability for member connections to be strengthened, surpassing even pre-pandemic levels. Membership and mentoring can occur across borders, and connections as meaningful as those developed in-person may form, as 3-D simulations offer association members the space to foster and nourish relationships on a far-reaching, consistent basis.

Potential Business and Legal Issues

Trade associations should also be mindful of the following business and legal considerations:

Select the Right Platform for Your Organization. Metaverse platforms have varying tradeoffs. Some, such as Roblox and Fortnite, offer access to more consumers but generally allow less control over program content. Others, such as Decentraland and the Sandbox, provide businesses with greater control but smaller audiences and higher barriers to entry. Trade associations should consider their target audience and their long-term Metaverse strategy before committing to a particular platform.

Make Governance Adjustments. Trade associations may consider adopting new membership models that include a separate tier for virtual engagement. For businesses that were previously unable to commit to trade association membership, new opportunities for engagement and increased access are likely to follow. Trade associations should prepare a plan for what to do with all of their global reach, their newfound members, and how they will create a member experience that mirrors traditional membership in the Metaverse. Associations should be mindful of how they will maintain control over their short-term and long-

term strategic direction.

Revise Contracts for the Virtual Environment. Trade associations entering into long-term event contracts with hotels and other venues should assess how their needs have changed and revise contracts accordingly. For example, associations might now require heightened Wi-Fi capabilities for supporting technologies. Associations may also need to negotiate provisions that consider the balance between fewer, in-person attendees in exchange for more virtual attendees for an overall, well-integrated experience.

Secure and Manage Your IP. Trade associations should consider filing trademark applications covering core Metaverse goods, services, or promotional materials. Additionally, associations should secure any available blockchain domains, which can be used to facilitate Metaverse payments and to direct users to blockchain content, such as websites and decentralized applications. And for any trade associations that license their IP, especially based on geographic and territorial lines, licensing rights should be revisited to properly allocate or address any Metaverse-related matters for which licensees may have rights.

Ready To Enter?

The Metaverse is, undoubtedly, a new frontier that warrants both enthusiasm and in-depth deliberation for trade associations that want in on the action. ArentFox Schiff offers a cross-disciplinary perspective to help trade associations and their members across industries develop practical strategies to maximize the value of the opportunities created by the Metaverse.

REAL ESTATE

Why Digital Real Estate Matters

Robert B. Koonin, Jamy Klotzbach, Kinnon McDonald, Karoline Nunez*

In the six months since Facebook, Inc. rebranded to Meta Platforms, Inc., the idea of the "Metaverse" has catapulted from a little-known science fiction fantasy to the forefront of popular culture. This year, digital real estate sales in the Metaverse are expected to double and reach $1 Billion.[1] Despite this surge of interest, there is still limited consensus on what the term means, and what the implications of this new technology will be on society and the economy. The emergence of digital real estate in the Metaverse presents a unique opportunity for the commercial real estate industry.

In this article, we will provide (i) a brief background on what the Metaverse is, and (ii) an overview of why the commercial real estate industry should take notice. Because of the evolving nature of real estate in the Metaverse, ArentFox Schiff will continue to monitor this matter and publish related alerts.

What Is the Metaverse?

There are multiple Metaverses. Some are built on blockchains ("onchain"), while others are built "offchain" in traditional video game environments. The common thread is that all are persistent, virtual environments where users can interact with each other in a three-dimensional world, attend dynamic, real-time events and purchase digital goods similar to in-app purchases. In onchain Metaverses, digital real estate may be purchased with cryptocurrency on any of the various Metaverse platforms; however, the current market is saturated in the primary platforms, including The Sandbox, Decentraland, Cryptovoxels and Somnium. As of today, roughly 95 percent of all virtual real estate sales in the Metaverse are happening in either in The Sandbox or Decentraland.[2]

Each Metaverse platform is made up of codes that are subdivided into a limited number of plots, similar to longitudes and latitudes on a map. After a plot is sold, the purchaser's information is recorded in a non-fungible token (NFT) that is coded onto a public blockchain. This code serves as a unique identifier and provides a secure chain of title. In other words, the purchase of an NFT and the related blockchain function similarly to a deed and the associated chain of title in a typical real estate transaction.

Why Should the Commercial Real Estate Industry Take Notice?

Ownership in the Metaverse is essentially absolute, and owners can develop, lease, sell, or otherwise use their virtual real estate as they wish. Owners of digital properties can construct office buildings, operate store fronts, lease property for events and erect billboards for advertising.

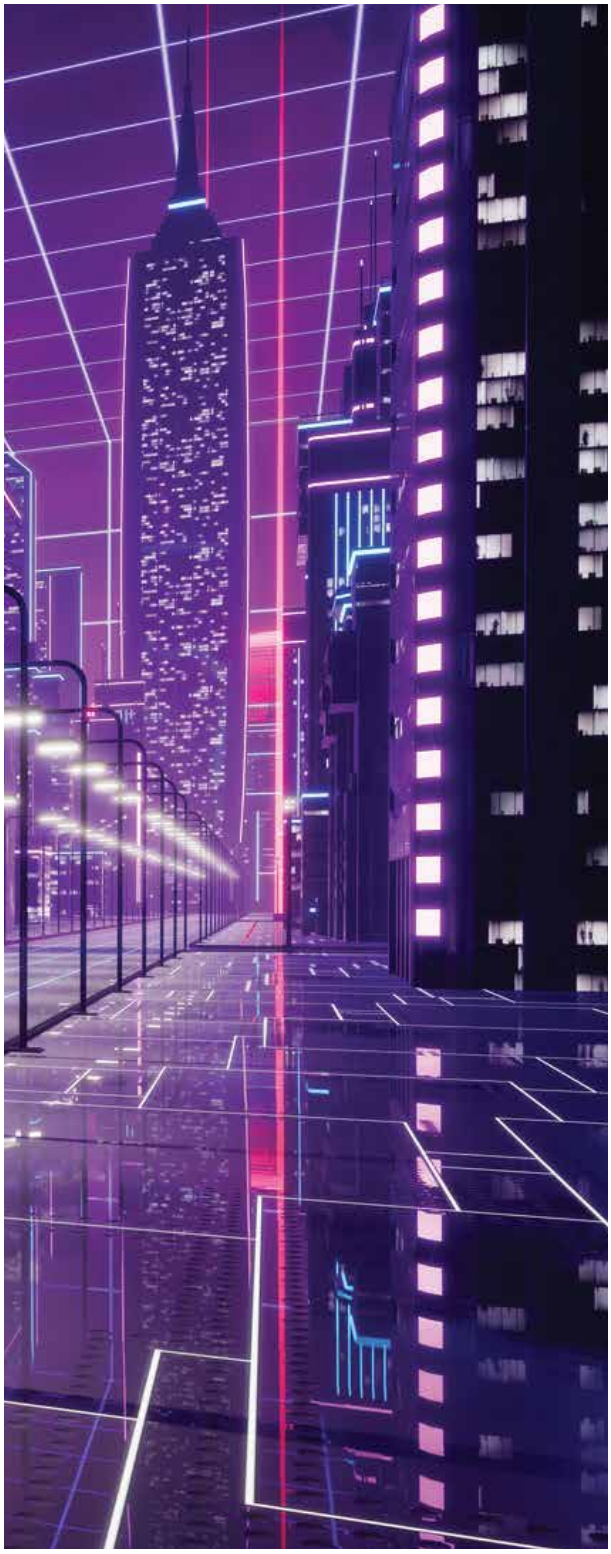
With the demand and prices of land in the Metaverse increasing, financing for virtual real estate has also begun. In January 2022, TerraZero Technologies provided one of the first "mortgage" loans for the purchase of virtual real estate in the Metaverse.[3] TerraZero first evaluated the borrower's business plan to profit on the virtual real estate before purchasing the land on the borrower's behalf, which it held title to until the loan was repaid and the NFT was transferred to the borrower.[4]

So far, the largest digital real estate transactions in the Metaverse have been purchased by crypto-based investment companies. Everyrealm (formerly Republic Realm) purchased 792 parcels of digital real estate in The Sandbox for $4.3 million and plans to develop some of the land with the gaming company Atari.[5] Tokens.com made a $2.4 million purchase in Decentraland, which it plans to develop for fashion events and retail purposes.[6]

Large players in the traditional real estate market are also taking notice. This year, J.P. Morgan Chase advertised its entrance into the Metaverse by opening a lounge in Decentraland, complete with a tiger and a portrait of Jamie Dimon.[7] HSBC purchased digital real estate in The Sandbox, which is expected to be developed into a stadium to host virtual sporting events.[8] Our firm, ArentFox Schiff, as well as other notable companies, such as Adidas, Gap, Hulu, PricewaterhouseCoopers, Nike, and Verizon, are also snatching up digital properties.[9]

As consumers and businesses adopt the Metaverse, advertising spending is expected to follow. J.P. Morgan Chase and Grayscale, a large investment firm, expect the Metaverse to yield $1 trillion in annual revenues in the coming years.[10] Many of the world's largest companies believe this growth will be inevitable as the Metaverse and the blockchain

technology behind it are better understood, similar to the rapid growth experienced by today's social media behemoths and search engine giants. Accordingly, many investors believe the price of digital real estate will rapidly appreciate in the near term as the increasing user base diminishes the limited supply of digital land, and digital landowners capitalize on advertising dollars.



[1] Robert Frank, Metaverse Real Estate Sales Top $500 Million, and Are Projected to Double This Year, CNBC, available here (last visited Apr. 24, 2022).

[2] Id.

[3] Phil Rosen, Metaverse mortgages are being issued to buy virtual land — and one of the first ever was just signed for a property in Decentraland, TerraZero Technologies, available here (last visited Apr. 29, 2022).

[4] Andrew Martinez, How does a metaverse mortgage work?, National Mortgage News, (10:05am, Feb. 3, 2022), available here.

[5] Republic Realm Completes Largest Ever Metaverse Land Acquisition, $4.28 Million USD, Republic Realm (Nov. 30, 2021), available here.

[6] Ian Shrine, Metaverse Real Estate Prices Are Booming. This Is Why, World Economic Forum (Mar. 10, 2022), available here (last visited Apr. 24, 2022).

[7] Kate Birch, JP Morgan Is the First Leading Bank to Launch in the Metaverse, FinTech (Feb. 17, 2022), available here (last visited Apr. 24, 2022).

[8] HSBC Becomes Latest Brand to Enter the Metaverse, PYMNTS.com (Mar. 16, 2022), available here (last visited Apr. 24, 2022).

[9] Birch, supra note 7.

[10] Christine Moy, Opportunities in the Metaverse: How Businesses Can Explore the Metaverse and Navigate the Hype vs. Reality (2022), available here (last visited Apr. 24, 2022).

REAL ESTATE

Risks to Know Before Investing

Robert B. Koonin, Jamy Klotzbach, Kinnon McDonald, Karoline Nunez*

Although the emergence of virtual "real" estate in the Metaverse presents a unique opportunity for the commercial real estate industry, there are risks associated with virtual real property.

We discuss four risks that investors in the commercial real estate industry should consider before purchasing virtual real property.

Risks to Consider

The unique nature of virtual real estate presents inherent risks that investors should be aware of. In addition, the novelty of the Metaverse has allowed scams to flourish. We have summarized four risks that we believe all investors should be aware of before transacting in the Metaverse.

1. **Platform Operators Control Virtual Real Property Rights**
   There are some obvious differences between traditional real estate and virtual real property that create unique risks for investors. Physical land and improvements are directly perceived by our senses, while virtual real estate can only be perceived through a medium. In other words, virtual real property can only exist on a platform. Therefore, should a platform's operator restrict an owner's access to the platform or delete the platform entirely, owners of virtual real property in the platform would be left with no property rights and little, if any, recourse.

   A platform operator can draft terms of use how they see fit, as virtual real property owners must accept terms as is. Indeed, most Metaverse platforms incorporate terms of use that insulate the operator from liability and enable the operator to exert influence over virtual real property rights with broad discretion. As noted in our previous alert, the current market is saturated in four primary platforms, including The Sandbox, Decentraland, Cryptovoxels and Somnium. Under Decentraland's[1] terms of use, the platform's operator has no continuing obligation to ensure the platform's longevity and "may cease to operate . . . in the future, at its exclusive discretion, with *no liability whatsoever* in connection thereto."[2] Likewise, the operator of The Sandbox[3] may, *"in its sole discretion"* and at any time, block an owner's access to the platform and terminate an owner's rights to create and upload content.[4] The Sandbox's terms specify that a banned or restricted owner retains title,[5] but its rights of ownership are severely restricted.

   Virtual real estate is not safeguarded by constitutional restrictions that protect owners of traditional real estate. For example, under the Fifth and Fourteenth Amendments to the United States Constitution, governments that take real property outright or indirectly by regulations that eliminate any economic utility may only do so for a public use and must provide just compensation. However, private entities, such as platform operators, are generally unrestricted by the Constitution. This means that virtual real property can be deleted and its access permanently blocked for any reason and without any compensation. Indeed, Decentraland's terms of use limit the platform's liability to the greater of (a) the amounts actually paid by the user in the 12-month period preceding the claim arose or (b) $100.[6]

   Therefore, platform operators wield more influence over virtual real property rights than do their government counterparts over traditional real property rights. The result is that virtual real property owners inherently have fewer property rights. Furthermore, little regulation enables platform operators to act with broad discretion with little liability, thereby increasing the likelihood of bad behavior. This risk is also unavoidable, as the lack of an insurance industry for virtual real property makes it impossible for owners to shift the risk to another party.

   Nonetheless, owners may be able to reduce risk by demanding market terms of use that contain owner friendly provisions. One of the most common trends is the emergence of Decentralized Autonomous Organizations (DAOs).

2. **DAOs Are Useful but Create More Complexity**
Some platforms, including Decentraland, are organized as DAOs, which are community-driven entities with no centralized authority. Decisions are made by votes of the DAO's members (commonly referred to as "token holders") based on governance protocols and executed by rules within smart contracts. In the context of Metaverse platforms, DAOs can be seen as onchain analogs to homeowners' associations by giving token holders input over a platform's rules and regulations.[7]

   Accordingly, DAOs decentralize the influence that would otherwise be consolidated in a platform operator. This reduces the risk that an owner's rights are limited, as rulemaking requires cooperation, which allows owners to lobby their interests. However, lobbying may increase the costs of virtual real property ownership and the added layer of complexity may result in inefficiencies.

3. **Smart Contracts Provide Security at the Cost of Flexibility**
Virtual real estate transactions in the Metaverse utilize smart contracts. Smart contracts are self-executing consensus protocols, which operate by a series of if-then statements agreed upon by the parties, which are written into code on a blockchain.[8] These smart contracts are used to facilitate purchases and sales of virtual real property.

   Smart contracts associated with non-fungible tokens (NFTs) also function as a deed. Once the sale is executed, the NFT is recorded on the blockchain, which is distributed in real time to all other nodes on the subject blockchain and provides evidence of the purchaser's ownership of the virtual real property.[9] Because smart contracts are linked to the blockchain, any adjustments to the code or protocols requires an affirmative vote of the DAO.[10]
Although smart contracts provide security to virtual real estate transactions, they also reduce flexibility. For example, once a purchase is added to the blockchain, it is final and there is no opportunity to amend or restate the terms without the consent of the DAO.[11] Accordingly, there is no room for error in negotiating the terms of a virtual real estate transaction. Furthermore, the law on smart contracts is undeveloped, and some purchases could ultimately be unenforceable.[12]

4. **Phishing and Other Scams**
The Metaverse is new and most consumers know little about it. Bad actors are taking advantage of this by creating fake links to the most popular Metaverse platforms. Once the link is activated, the scammer has access to the consumer's virtual wallet and can transfer its consents through a smart contract. As a result, the transfers are almost impossible to amend, which means the stolen cryptocurrency is essentially impossible to retrieve. Cryptocurrency- based crime equaled $14 billion in 2021.[13] Indeed, fraudulent Metaverse links are so lucrative that many of these links are readily available for sale on the dark web.[14]

   To prevent these scams, virtual real estate investors should incorporate two-step authorization to better protect their virtual wallets.[15] Some blockchain-based businesses are beginning to incorporate features that allow cryptocurrency to be reported stolen, which disables the reported cryptocurrency from being able to be bought or sold to discourage phishing scams.[16]

Conclusion

Before purchasing virtual real property, investors should be aware of certain structural risks, such as the broad control a platform operator has over virtual real property rights. As DAOs become market, virtual property rights will become more complicated. Investors should also be mindful of the immutable nature of smart contracts and cryptocurrencies and be careful to completely negotiate terms and to avoid scams.

[1] As of the date of this Alert, Decentraland is one of the most popular Metaverse platforms for digital real property ownership. Id.

[2] Terms of Use, Decentraland, available here. (emphasis added) (last visited June 19, 2022).

[3] As of the date of this Alert, The Sandbox, is one of the most popular Metaverse platforms for digital real property ownership. See supra note 2.

[4] Terms of Use, The Sandbox, available here. (emphasis added) (last updated October 26, 2021).

[5] Id.

[6] See supra note 4.

[7] Decentralized Autonomous Organizations (DAOs), Ethereum, available here. (last visited June 19, 2022).

[8] Id.

[9] Id.

[10] Stuart D. Levi & Alex B. Lipton, An Introduction to Smart Contracts and Their Potential and Inherent Limitations, Harv. L. Sch. Form on Corp. Governance (May 26, 2008), available here.

[11] Id.

[12] Craig de Ridder & Robert Howard, Investing in Metaverse Real Estate: Mind the Gap Between Recognized and Realized Potential, JD Supra (Apr. 21, 2022), available here.

[13] Crypto Crime Trends for 2022: Illicit Transaction Activity Reaches All-Time High in Value, All-Time Low in Share of All Cryptocurrency Activity, Chainalysis.com (Jan. 6, 2022), available here.

[14] Eamon Javers et al., Cybercriminals target Metaverse investors with phishing scams, CNBC (May 26, 2022), available here.

[15] Id.

[16] Id.

SENIOR LIVING

A Legal Primer

Jo-Ann Marchica, Stephen Blake, Mindy Pittell Hurwitz

The Metaverse is widely regarded as the next frontier in digital commerce, with businesses across industries spending millions of dollars to position themselves as market leaders. While it offers clear opportunities for businesses, the Metaverse also presents unique legal challenges. We highlight a few key legal issues businesses in the senior living industry should consider before making the leap.

The Business Case for the Senior Living Industry

The Metaverse offers unique opportunities for the senior living industry. Consider the virtual tour used in marketing efforts, and reimagine it as a chance for facilities to offer prospective residents a chance to interact with facility amenities and personnel. From a basic level, the ability to market the Metaverse as an amenity has value in itself. On a larger scale, it could lead to the development of a hybrid home health and senior living community offering, with the Metaverse providing that community setting.

While the business opportunities are clear, the Metaverse additionally offers the possibility of improving resident care. For example, the Metaverse gives faraway family members the opportunity to connect with residents in a setting more engaging than a phone call or video chat—a critical alternative in light of the social isolation issues highlighted in the pandemic.

Before making a leap into a Metaverse platform, businesses should consider these six legal issues:

1. **Take custody of digital assets.** Because of their digital character, digital assets such as cryptocurrency and non-fungible tokens (NFTs) are uniquely vulnerable to loss and theft. Before acquiring cryptocurrency or NFTs, businesses will need to set up a secure blockchain wallet and adopt appropriate access and security controls.
2. **Establish a dedicated legal entity.** Businesses may want to consider setting up a new subsidiary or affiliate to hold digital assets, shield other parts of their business from Metaverse-related liability, and deal with the potential tax consequences.
3. **Select the right platform for you.** There are multiple Metaverse platforms, and they all have tradeoffs. Some, such as Roblox, offer access to more consumers but generally give businesses less control over content within the programs.

Others, such as Decentraland and the Sandbox, provide businesses with greater control but smaller audiences and higher barriers to entry. Businesses should consider who their target audience is and their long term Metaverse strategy before committing to a particular platform.

4. **Register your IP.** Businesses should consider filing trademark applications covering core Metaverse goods or services and securing any available blockchain domains, which can be used to facilitate Metaverse payments and to direct users to blockchain content, such as websites and decentralized applications. Given the accelerating adoption of blockchain domains along with limited dispute resolution recourse available, we strongly encourage brands to consider securing intellectual property rights now.

5. **Protect and enforce your IP.** The decentralized nature of the Metaverse poses a significant challenge to businesses and intellectual property owners. Before proceeding with blockchain-based transactions, including purchasing or minting NFTs, businesses need to understand that content recorded on a blockchain is there permanently and cannot be deleted. Restrictions on use and resale of an NFT must be carefully considered and implemented prior to minting because once the content is on the blockchain, there is little recourse.

6. **Reserve Metaverse rights.** Businesses that license their IP, particularly those that do so on a geographic or territorial basis, should review existing license agreements to determine what rights, if any, their licensees have for Metaverse-related uses. Moving forward, we encourage brand owners to expressly reserve your rights for Metaverse-related uses and exercise caution before authorizing any third party to deploy your IP to the Metaverse on your behalf.

Ready to Enter?

The Metaverse poses a tremendous opportunity for businesses to connect directly with consumers in an interactive way that was considered science fiction just a few years ago. But like every new frontier, technological or otherwise, there are legal and regulatory hurdles to consider and overcome. Some are familiar, while others are novel. The lawyers in ArentFox Schiff offer a cross-disciplinary perspective to help producers, distributors, retailers, and their partners in the senior living industry come up with practical strategies to maximize the value of the opportunities created by the Metaverse.an entire person, or specific organs and systems. Such a visual 3D and interactive representation would be more user-friendly and likely more informative to a clinical researcher.

SPORTS

Engaging Fans

Richard L. Brand, *Zak Welsh*, *Anjelica L. Fuccillo*

The interactive tools that the Metaverse offers are a perfect complement to a crucial component of the sports industry: fan engagement. And with an influx of industry players establishing a presence in the Metaverse, the way we consume sports may transform sooner than we think. As stakeholders quickly realize the benefits of this "next generation internet," it is important to properly evaluate the industry-specific risks presented by the Metaverse. Following are some key considerations from both a Metaverse perspective and a physical world perspective.

A Quick Look At the Intersection of Sports and the Metaverse

The Metaverse is a computer-generated, persistent, immersive environment that may include elements of augmented reality and virtual reality. The user, depicted as an avatar, can interact with others, consume goods, and travel just like in the physical world, which in turn allows for engagement opportunities that have not been previously possible.

In the sports world, the breakdown of geographical and physical barriers afforded in the Metaverse provides all fans with the ability to enjoy the attributes of attending a live sporting event, but in the comfort of their home or other locations. Viewing in the Metaverse comes with certain benefits, such as the ability to walk on the field alongside players and watch the sporting event from different areas of the venue. Because of the opportunity for brands, leagues, teams, and players to reach and interact with fans at unprecedented levels, the Metaverse will likely continue to be one of the key ways in which viewers consume sports. The concept is quickly becoming a reality as we continue to see an influx of market players establishing a presence in the Metaverse – recent activity includes the English Premier League reportedly filing for NFT and Metaverse trademarks, the Atlanta Braves launching Digital Truist Park, which is the first Major League Baseball park in the Metaverse, Kevin Durant reportedly filing for 26 NFT and Metaverse applications, and Sports Metaverse by SportsIcon, a Metaverse dedicated to sports, launching its initial public land sale.

Key Considerations

As with every new frontier, technological or otherwise, the Metaverse poses legal and regulatory hurdles. The following considerations should be evaluated by sports stakeholders that are considering a Metaverse presence:

- How does the Metaverse affect the scope of existing license agreements? Should license agreements include carveouts for the Metaverse or other digital-only uses moving forward?
- What challenges come with purchasing and developing real estate in the Metaverse?
- How does the Metaverse impact the scope of existing broadcasting and territorial rights?
- Will playback technology offered to fans be available to leagues if there is a challenge on a play?
- Should policies that address the recognition of different digital assets be put in place?
- How will digital assets be managed?
- Should teams register copyrights in their avatars? What rights would the player have in an avatar that depicts him or her in real-time? What happens if the player registers a trademark first? Could we anticipate the foregoing to be addressed in collective bargain agreements?
- Will employment be offered in the Metaverse (for vendors, staff, etc.)?
- How should data rights be addressed?
- What are the general tax implications?
- What disclosures should be made (from both a corporate and regulatory perspective)?
- What kind of privacy, cybersecurity, and access protections should be implemented?

As we move into the future, the Metaverse appears poised to provide a tremendous opportunity for the sports industry to connect directly with consumers in an interactive way that was until recently considered science fiction. ArentFox Schiff offers a cross-disciplinary perspective to help stakeholders across the sports industry come up with practical strategies to maximize the value of the opportunities created by the Metaverse.

VENTURE CAPITAL

Considerations for Investors

David M. Barbash, *Amal U. Dave*

The Metaverse is shaping up to be the next frontier in digital commerce, with businesses across industries spending millions of dollars buying digital real estate and investing in platforms to be market leaders. This has made companies with Metaverse operations hot targets for venture capitalists and other investors looking to get in on the ground floor. Although Metaverse-involved companies offer exciting opportunities, investors need to pay special attention to legal issues present for these targets. We highlight a few key legal issues for investors to keep on their radar while conducting diligence and negotiating investment documents.

What is the Metaverse?

At its core, the Metaverse is the next generation of the Internet. Built largely on decentralized, blockchain technology instead of centralized servers, it consists of immersive, 3D experiences with vibrant digital marketplaces, persistent and traceable digital assets, and a strong social component. While some elements remain aspirational, consumers are already flocking to Metaverse platforms and spending significant sums on digital assets, making it an exciting opportunity for virtually all businesses, even those relying on physical space or face-to-face interaction, to generate revenue. Meanwhile, many tech companies are working on next-generation consumer electronics such as smart glasses that they hope will take e-commerce to the next level and make today's two-dimensional web browsing a thing of the past.

All of these developments lead to fertile ground for venture capitalists and other investors placing bets on which technologies will pay off in the future.

Diligence Issues in Metaverse-Involved Transactions

Investors evaluating targets with Metaverse operations should carefully evaluate these operations. Here are three key diligence considerations:

1. **Custody of Digital Assets.** Metaverse-involved businesses often possess and rely on digital assets such as cryptocurrency and non-fungible tokens (NFTs), which are uniquely vulnerable to loss and theft. Investors should ensure that potential targets have set up a secure blockchain wallet and adopted appropriate access and security controls.

2. **Platform Terms and Conditions** There are multiple Metaverse platforms, and they all have tradeoffs. Some, including Roblox and Fortnite, offer access to more consumers but generally give businesses less control over content within the programs. Others, such as Decentraland and the Sandbox, provide businesses with greater control but smaller audiences and higher barriers to entry. Investors should critically evaluate the terms and conditions of the platform selected to ensure that they align with the target's business objectives.

3. **Registered IP.** Investors should ensure that targets have filed appropriate trademark applications covering core Metaverse goods or services and securing any available blockchain domains, which can be used to facilitate Metaverse payments and to direct users to blockchain content, such as websites and decentralized applications. Given the accelerating adoption of blockchain domains along with limited dispute resolution recourse available, targets should secure intellectual property rights now.

Special Representations, Warranties & Indemnities

Given the novelty of Metaverse operations, investors may also seek to supplement their diligence with special representations and warranties relating to Metaverse operations.

1. **Regulatory Compliance.** Investors should consider whether specific representations and indemnities are needed relating to compliance of the target's Metaverse operations with applicable regulations. This is especially true for heavily regulated industries such as healthcare, alcoholic beverages, and financial services. For example, an investor considering an investment in a Metaverse financial services startup might want special assurances that the target's Metaverse operations comply with applicable regulations relating to providing financial advice in all of the jurisdictions relevant to its target users.

2. **IP Infringement and Enforcement.** Investors may want special representations certifying

that a target's Metaverse operations do not infringe on a third party's intellectual property and that the target is enforcing its intellectual property rights in the Metaverse.

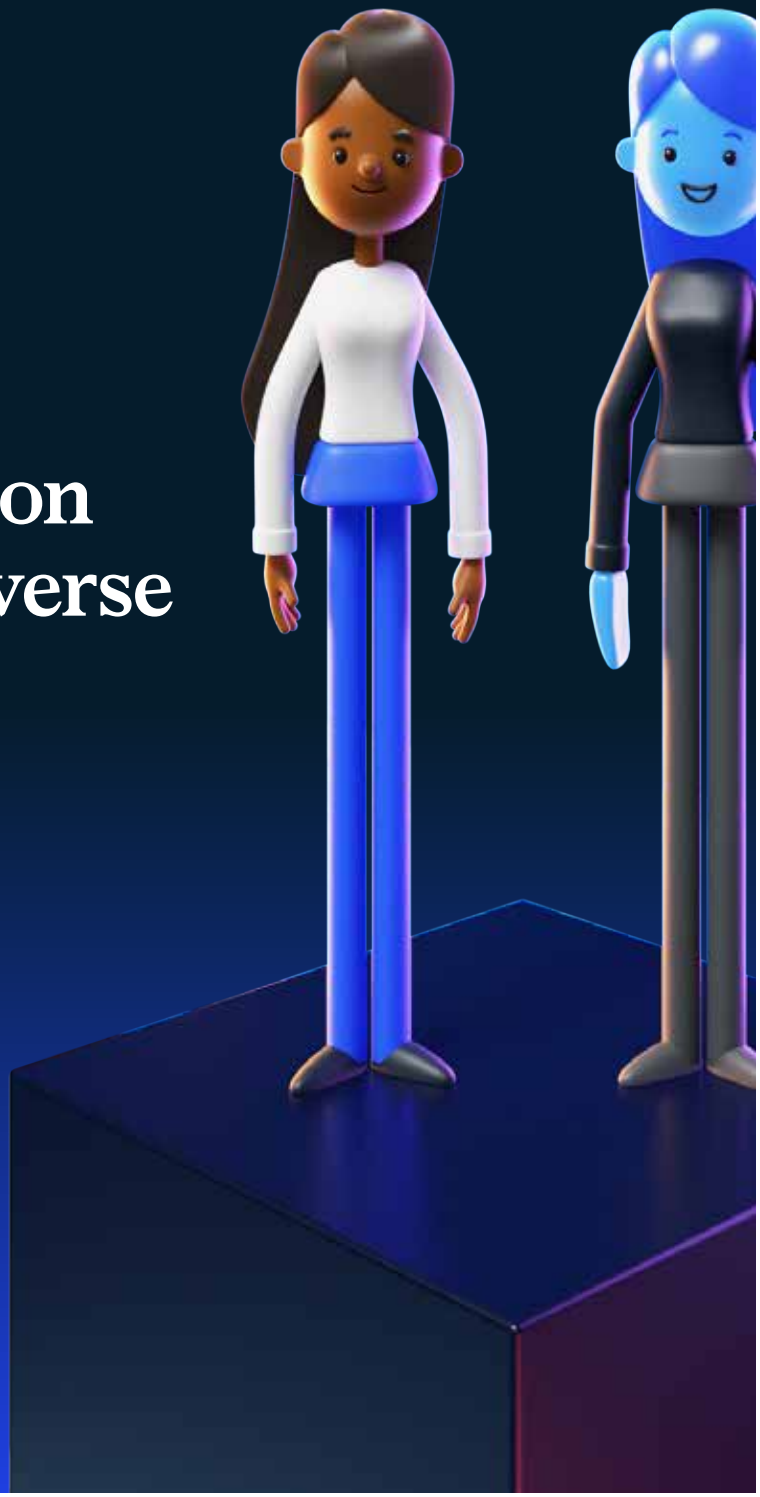
3. **Data Privacy.** Investors should ensure that the target's Metaverse operations, including the collection, use, and transfer of any user data, comply with data privacy rules in all of the jurisdictions relevant to its target users.

While typical purchase agreement representations might provide general coverage, focusing specifically on the compliance of Metaverse operations may be helpful in ensuring that management is adequately focused on the target's Metaverse operations. This is especially critical as Metaverse operations may span multiple jurisdictions, and the regulatory scheme is still evolving.

Ready to Enter?

The Metaverse poses a tremendous opportunity for investors as the technology threatens to change the way that people interact with businesses and each other in the digital environment. But like every new frontier, there are legal and regulatory hurdles to consider and overcome; some are novel, some are familiar. The lawyers in ArentFox Schiff offer a cross-disciplinary perspective to help investors develop practical strategies to efficiently evaluate targets with operations in the Metaverse and appropriately mitigate risks posed by this rapidly evolving space.

McKinsey & Company



June 2022

Value creation in the metaverse

The real business of the virtual world

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Preface

This report examines the emergence of the metaverse: its history and characteristics, the factors driving investment, how consumers and businesses are using it today and may in the future, its value-creation potential, and how leaders and policy makers can plan their strategies and near-term actions. Our work began by surveying more than 3,400 consumers and executives on metaverse adoption, its potential, and how it may shift behaviors. We also interviewed 13 senior leaders and metaverse experts. In analyzing the metaverse's value-creation potential and total investment landscape, we examined the drivers of activity among major corporations, venture capital, and private-equity funds. We examined the potential impact of the metaverse on sectors most closely tied to its technology and uses, with our work supplemented with additional research, case studies, and real-world examples.

This latest research is the result of collaboration between multiple practices within McKinsey, including Growth, Marketing & Sales, McKinsey Digital, and Telecommunications, Media & Technology. We also drew on the expertise of the McKinsey Technology Council, which comprises more than 60 scientists, engineers, investors, and entrepreneurs from external tech organizations and institutions, along with our own internal experts. This report also leverages an expanding body of knowledge around the metaverse and deep expertise among our McKinsey colleagues, including contributions from: Jiamei Bai, Kim Baroudy, Ian De Bode, Marc Brodherson, Gordon Candelin, Marek Grabowski, Matt Higginson, Klemens Hjartar, Marius Huber, Vinayak HV, Nils Jean-Mairet, Chau Nguyen, Ichiro Otobe, Kim Rants, Kartik Trehan, and Richard Ward. We also sought the expertise of metaverse expert Matthew Ball, managing partner of EpyllionCo and McKinsey knowledge partner.

The project team comprised Inês Araújo Lopes, Antonio Celso Maciel Tavares, Andreas Henriksen, Madalina Kmen, Lotte Lauer, Estelle Menye Zanga, Philibert Parquier, Stephen Schwab, Ewa Starzynska, and Peter Vang. We would also like to thank Growth, Marketing & Sales' Global Communications Director Cindy Van Horne, Global Publishing Manager Molly Katz, and Global Publishing Coordinator Hannah McGee, as well as Luke Collins, Jen Thiele, and John-Michael-Maas for their editorial leadership. Additionally, we would like to thank the extended communications team EMEA External Relations Manager Kinga Young, North America External Relations Manager Eric Sherman, Global Digital Specialist Sharon Woo, Communications Specialist Marion Obadia, and Jason Forrest.

Finally, we sincerely thank the senior executives and experts who graciously agreed to be interviewed to provide their perspective on the current state of the metaverse and its potential.

Our ambition is for this report to help drive ongoing dialogue about the development of the metaverse, help leaders of both consumer and business-to-business clients better understand its power and potential, identify strategic imperatives, and act as a force for its positive evolution. This work is independent and has not been commissioned or sponsored in any way by any business, government, or other institution.

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In brief

Value creation in the metaverse
The metaverse is still being defined, both literally and figuratively. Yet its potential to unleash the next wave of digital disruption seems increasingly clear, with real-life benefits already emerging for early adopting users and companies. As we saw in previous shifts in technology such as the emergence of the internet followed by social media, mobile, and cloud, novel strategies can quickly become table stakes. The metaverse has the potential to impact everything from employee engagement to the customer experience, omnichannel sales and marketing, product innovation, and community building. Examining its potential effect should be part of strategy discussions, with leaders accelerating their analysis of how the metaverse could drive a very different world within the next decade. Of course, many questions remain, including how virtual worlds will be balanced with the physical world to ensure the metaverse is built in a responsible manner, how it can be a safe environment for consumers, how closely it will align with the "open" vision of the next iteration of the internet, and whether technology can advance quickly enough to build the metaverse of our imagination. This report examines the metaverse's building blocks, investment flows, and what is driving them, and how consumer and business behavior is evolving, its potential economic impact, and actions leaders should consider to capture value.

— There continue to be questions around the longevity and potential of the metaverse, with an extreme view regarding it as merely a rebranded gaming platform of little wider interest. We do not share that skepticism and believe the metaverse has the potential to be the next iteration of the internet. It may seamlessly combine our digital and physical lives by featuring a sense of immersion, real-time interactivity, user agency, interoperability across platforms and devices, the ability for thousands of people to interact simultaneously, and use cases spanning activities well beyond gaming. But the pace of its development will depend on multiple technological and user-experience factors, and is not limited to one platform, device, or even technology.

— The metaverse's technology stack has four core building blocks: content and experiences, platforms (such as game engines), infrastructure and hardware (including devices and networks), and enablers (such as payment mechanisms and security). Ten layers span these components, providing the critical building blocks on which all metaverse experiences are based. One primary question about the future evolution of the metaverse is the extent to which the interoperability of these elements can be advanced.

— Large technology companies, venture capital (VC), private equity (PE), start-ups, and established brands are seeking to capitalize on the metaverse opportunity. Corporations, VC, and PE have already invested more than $120 billion in the metaverse in the first five months of 2022, more than double the $57 billion invested in all of 2021, a large part of it is driven by Microsoft's planned acquisition of Activision for $69 billion. Large technology companies are the biggest investors—and to a much greater extent than they were for artificial intelligence (AI) at a similar stage in its evolution, for example. Industries currently leading metaverse adoption also plan to dedicate a significant share of their digital investment budgets to it.

— Multiple factors are driving this investor enthusiasm, including ongoing technological advances across the infrastructure required to run the metaverse; demographic tailwinds; increasingly consumer-led brand marketing and engagement; and increasing marketplace readiness as users explore today's early version of the metaverse largely driven by gaming (with some games boasting tens of millions of active players) with applications emerging that span socializing, fitness, commerce, virtual learning, and others.

— Our survey of more than 3,400 consumers and executives found significant excitement about the potential of the metaverse. Almost 60 percent of consumers using today's early version of the metaverse are excited about transitioning everyday activities to it, with connectivity among people the biggest driver, followed by the potential to explore digital worlds. Some 95 percent of business leaders expect the metaverse to have a positive impact on their industry within five to ten years, and 61 percent expect it to moderately change the way their industry operates. Industries most likely to be impacted by the metaverse include consumer and retail, media and telecommunications, and healthcare, and those industries are also among those already undertaking metaverse initiatives.

— While estimates of the potential economic value of the metaverse vary widely, our bottom-up view of consumer and enterprise use cases suggests it may generate up to $5 trillion in impact by 2030—equivalent to the size of the world's third-largest economy today, Japan. It is shaping up to be the biggest new growth opportunity for several industries in the coming decade, given its potential to enable new business models, products, and services, and act as an engagement channel for both business-to-consumer and business-to-business purposes.

— The potential impact of the metaverse varies by industry, although we believe it holds implications for all. For instance, we estimate it may have a market impact of between $2 trillion and $2.6 trillion on e-commerce by 2030, depending on whether a base or upside case is realized. Similarly, we estimate it to have an impact of $180 billion to $270 billion on the academic virtual learning market, a $144 billion to $206 billion impact on the advertising market, and a $108 billion to $125 billion impact on the gaming market. These effects may manifest in very different ways across the value chain, however.

— Companies already leveraging the metaverse may build lasting competitive advantages. Business leaders should develop a strategic stance by defining metaverse goals and the role they want to play; testing, learning, and adopting by launching initial activities, monitoring results, and examining user behavior; and preparing to scale by identifying necessary capabilities and embedding the metaverse in their operating model. They should also explore becoming metaverse users themselves.

— The metaverse also poses urgent challenges that cut across firms, their employees, independent developers and content creators, governments, and, of course, consumers. Part of the workforce will need to be reskilled to take advantage of it rather than compete with it, and cities and countries serious about establishing themselves as hubs for its development will need to join the global competition to attract talent and investment. The metaverse also has obvious societal implications. A variety of stakeholders will need to define a road map toward an ethical, safe, and inclusive metaverse experience. Guidelines may also be necessary around issues including data privacy, security, ethics and regulatory compliance, physical health and safety, sustainability, and equity and fairness.

Value creation in the metaverse

The real business of the virtual world

What's the opportunity?

In **2021**, venture capital and private-equity funding into the metaverse reached

$13 billion

By **2030**, the value of the metaverse could reach…

~$5 trillion

In **2022** already, investment into the metaverse space is more than double what it was in all of **2021**

>$120 billion +

Consumers and brands are already engaging

59% of consumers are excited about transitioning their everyday activities to the metaverse

57% of metaverse-aware companies say they are adopters

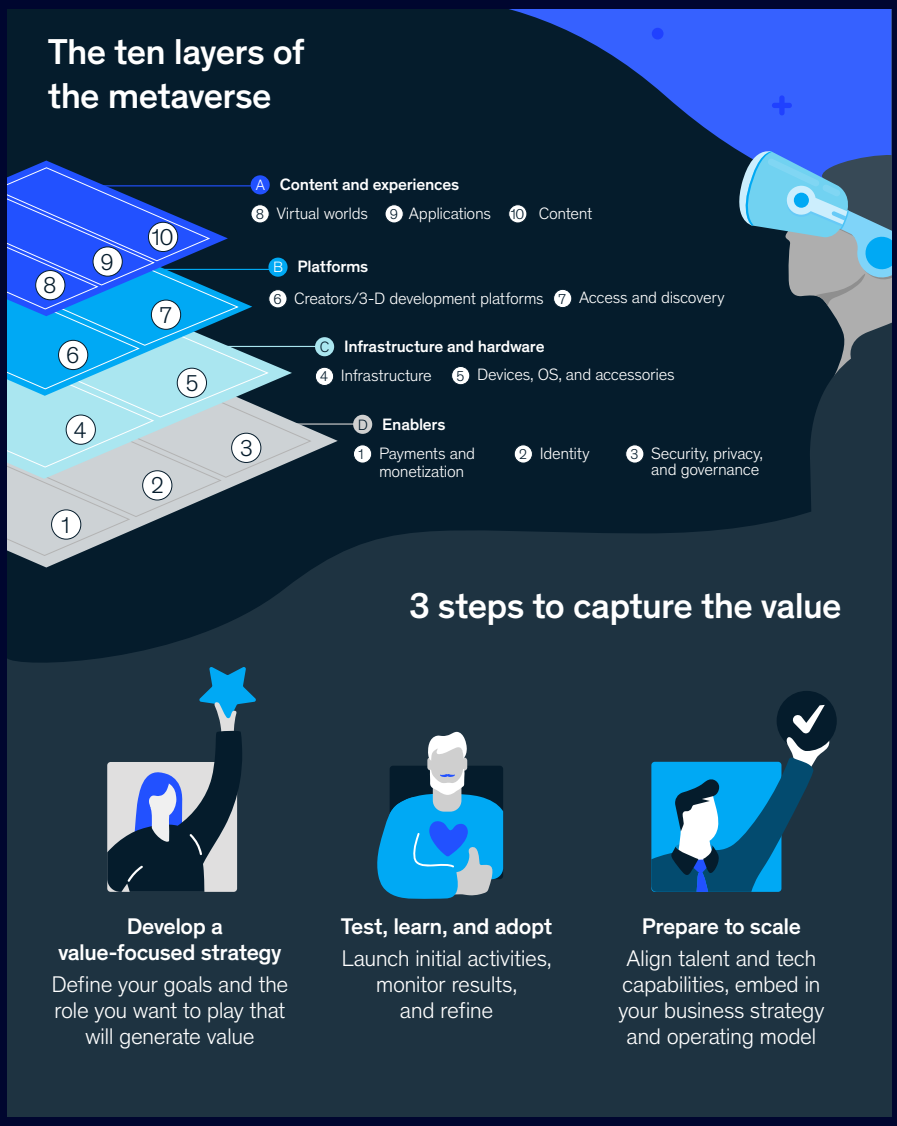
Top 5 activities consumers are excited about

- Social
- Entertainment
- Gaming
- Travel
- Shopping

Top 5 enterprise use cases companies are implementing

- Marketing campaign or initiatives
- Learning and development for employees
- Meetings in the metaverse
- Events or conferences
- Product design or digital twinning

Value creation in the metaverse: The real business of the virtual world


The ten layers of the metaverse
A Content and experiences
8 Virtual worlds
9 Applications
10 Content
B Platforms
6 Creators/3-D development platforms
7 Access and discovery
C Infrastructure and hardware
4 Infrastructure
5 Devices, OS, and accessories
D Enablers
1 Payments and monetization
2 Identity
3 Security, privacy, and governance
3 steps to capture the value
Develop a value-focused strategy
Define your goals and the role you want to play that will generate value
Test, learn, and adopt
Launch initial activities, monitor results, and refine
Prepare to scale
Align talent and tech capabilities, embed in your business strategy and operating model

Introduction

It is 1992. A group of students and researchers at the University of Illinois are creating the Mosaic browser, a user-friendly way to search the nascent internet. This is made available to the world a year later—the same year CERN releases into the public domain the World Wide Web software that Tim Berners-Lee has invented three years earlier.[1] Yet mobile phones still have buttons, the iPhone won't appear for another 15 years, and the iPad is still 18 years away. And even if those devices had somehow miraculously existed, Wi-Fi did not appear until 1997.

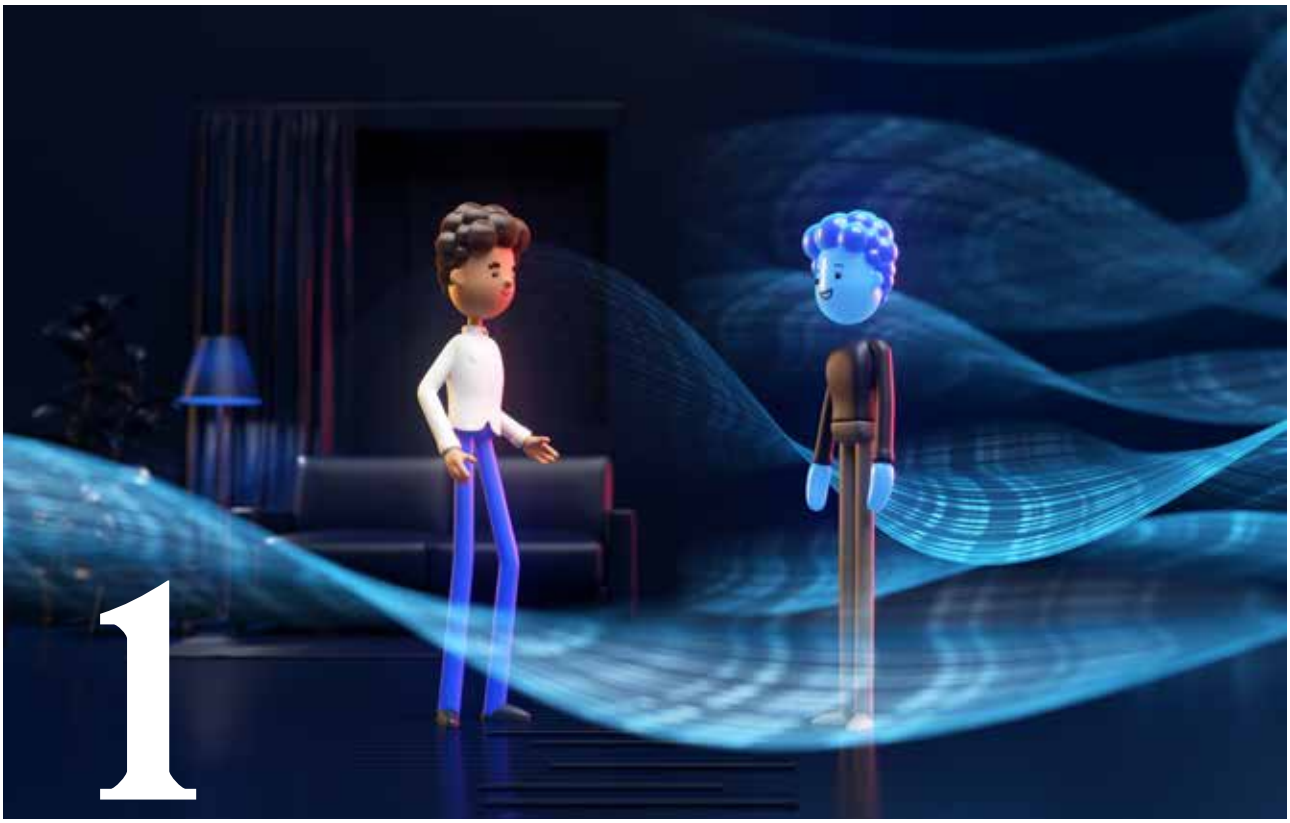
So much technology we take for granted today seemed almost impossible 30 years ago. In a decade or two, how will we look back on today? It depends. The metaverse is at an inflection point in its development, just as the social networks and user-generated content driving the transition to Web 2.0 in 2004 sparked utopian visions of consumer control and the democratization of the internet. The direction the metaverse takes is tied to stakeholders' collective actions in the years ahead, and the extent to which their behavior is influenced by considerations of its potential societal and environmental impact.

Of course, there are also significant challenges to be overcome. Just as it took time to develop the technology that sparked the emergence of our devices today, the metaverse of people's imaginations is not currently technically feasible. Networks are too slow, and computing power too weak. Graphics engines need to be exponentially more powerful, and interface hardware is needed to truly take advantage of the technology as it evolves.

Yet it would be brave to bet against the developing solutions and billions of dollars flowing into every corner of metaverse infrastructure. Even if it feels as though we have seen something like this before—almost two decades ago, *Second Life* became a phenomenon by introducing game players to the notion of "living" in an always-on virtual world, only for it to seemingly disappear (it still exists and attracts new users each month[2])—the reality is that the metaverse *is* different.

The "proto-metaverse"[3] exists, fueled by a powerful force: the gaming experience. Gaming eclipses other subsectors of the entertainment industry with its popularity. With more than three billion users globally[4] and a total value of more than $200 billion,[5] the gaming sector is larger than movies and music. Consumers and companies are already experimenting with the early metaverse for everything from socializing to fitness, commerce, virtual learning, and scores of other daily activities. Like any technology, the metaverse is neither inherently good nor bad; it will be what we make it, and we can learn from previous eras of dramatic technological change.

This report acknowledges the metaverse's positive potential with a focus on its likely economic and business impact. But while the future appears bright, there will inevitably be challenges. The metaverse is still in a relatively nascent state with current adoption comparable to where artificial intelligence (AI) adoption was five years ago.[6] Our survey conducted for this report found executives are generally positive about it: metaverse adopters report greater financial success and a more positive outlook compared with their peers, with higher current and expected profit margins.[7] But much depends on how the metaverse evolves. And how the world evolves too.



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Defining the undefined: What is the metaverse, really?

It is a gaming platform, a virtual retail destination, a training tool, an advertising channel, a digital classroom, a new gateway to digital experiences. The metaverse seems to be whatever people's imaginations dream it to be. But today the metaverse remains difficult to define,[8] even though the term has been in circulation for decades. What we do know is that, beyond the hype, the metaverse is real, potentially revolutionary, and has the makings of a significant opportunity. Yet how it will eventually develop remains to be seen.

While the definition is still fluid—and will likely continue to be for some time—the consensus view is the metaverse is the next iteration of the internet, where it becomes something we are immersed in, rather than something we just view. "The metaverse will be the successor to the mobile internet," Mark Zuckerberg said last November as he announced that the name of the company he cofounded, Facebook, was changing to Meta. "We'll be able to feel present—like we're right there with people no matter how far apart we actually are."[9]

Definition and characteristics

Our working definition positions the metaverse as the next iteration of the internet that seamlessly combines our digital and physical lives. "We're trying to not define the metaverse so rigidly that it limits the imagination of creators," Square Enix CEO Yosuke Matsuda told us. Beyond this, two things are clear. First, the development of the metaverse is gaining momentum as billions of dollars are invested, gaming continues to seed the emerging (or "proto") metaverse, and nongaming use cases emerge for both businesses and consumers. Second, despite many different potential definitions of the metaverse, it has several foundational characteristics:

— At its most basic, the metaverse will have three features:

- a sense of immersion
- real-time interactivity
- user agency

— Ultimately, the full vision of the metaverse will also include the following:

- interoperability across platforms and devices
- concurrency with thousands of people interacting simultaneously
- use cases spanning human activity well beyond gaming

Separating fact from fiction

The metaverse captured universal headlines for the first time after Facebook's name change last year. Yet Steven Spielberg's *Ready Player One* was released three years earlier, based on a novel released in 2011.[10] And the concept of the metaverse far predates that—the term was first coined in Neal Stephenson's 1992 novel *Snow Crash*, and versions of what's now the metaverse have evolved for almost half a century

'We have Instagram. We have email. We have messaging. And then there's our real-life friends; the real-life activity that we're participating in. Sometimes there's an intersection between those two. But when I think about a real-world vision of the metaverse, it's really a union of those where they become much more deeply fused; where there's a digital extension to everything that's real.'

–John Hanke, CEO of Niantic

(see sidebar "The history of the metaverse"). Yet for a concept now three decades old—and something increasingly used by consumers and businesses alike, whether they understand the term or not—there are several persistent misconceptions about the metaverse.

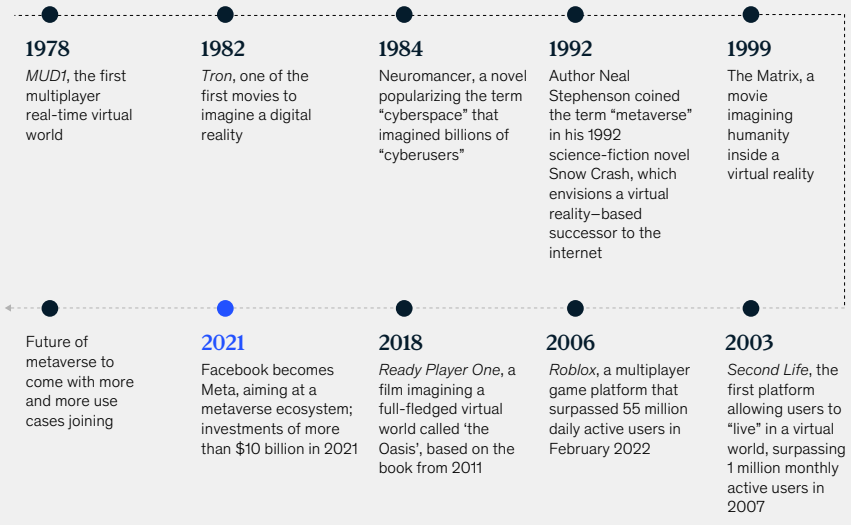
The metaverse does not replace real life

Ready Player One presents a virtual world (the OASIS) as infinitely superior to the dystopian real world. Yet the actual metaverse does not represent a choice between the virtual and the real worlds. The best, superior version of the metaverse will complement rather than compete with the real world, enhancing our real-life experiences rather than supplanting them. "I think about the metaverse as a continuation of where tech was headed prior to COVID-19," Niantic CEO John Hanke told us. "We have Instagram. We have email. We have messaging. And then there's our real-life friends; the real-life activity that we're participating in. Sometimes there's an intersection between those two. But when I think about a real-world vision of the metaverse, it's really a union of those where they become much more deeply fused; where there's a digital extension to everything that's real."

There are not multiple metaverses

Saying there are many metaverses is like saying there are many internets. The metaverse is the envisioned end state—incorporating all digital worlds alongside the physical world, with interoperability between them all. As it exists now, metaverse users are spread across multiple platforms; for example, *Decentraland*, *Fortnite*, *Minecraft*, *Roblox*, and *The Sandbox*.

The history of the metaverse



> ‘We’re trying to not define the metaverse so rigidly that it limits the imagination of creators,’
>
> –Yosuke, Matsuda, CEO of Square Enix

The metaverse is not AR/VR

Augmented and virtual reality (AR/VR) are important interfaces to help users experience the metaverse, and point to some of its potentially more exciting experiences (for instance, our research found 62 percent of respondents were excited or very excited by the possibility of travel in the metaverse, especially the ability to visit “places I can’t physically go”—including space). Yet AR and VR join technologies such as smartphones and laptops as just one of many ways people can interact with the metaverse. And we may use very different devices to access metaverse platforms in the future.

The metaverse is not (just) gaming

Gaming has been critical in seeding the metaverse, but the metaverse is not exclusive to gaming. In fact, even some gaming platforms are evolving to address multiple use cases, such as virtual concerts being held in *Fortnite*. And while gaming is indeed the most common activity across all generations and the most popular among Gen Z (87 percent of Gen Z respondents in our survey said they were engaged in gaming), fitness, education, and shopping are popular among millennials, while baby boomers also engage in shopping. That points to the existing and growing appetite among consumers to engage with companies well beyond gaming: 62 percent of consumers we surveyed have engaged with one or more branded virtual experiences, 36 percent are excited about technology brands entering the metaverse, and 30 percent are excited about apparel, fashion, and luxury brands doing so.

The metaverse is not Web3

The first generation of the internet is typically defined as the period from 1991 to 2004, when web pages were largely static and users simply consumed content. The next generation—Web 2.0—was marked by the emergence of social networking and user-generated content.[11] The metaverse *sounds* a lot like Web3. But while Web3 contributes to the metaverse by espousing decentralization and interoperability, it’s not *the* metaverse, which is anchored on immersive experiences that can be both centralized or decentralized (for more on the difference, see sidebar “Advances from Web 2.0 to Web3 give rise to the metaverse”). “Why do these two terms get mixed together?” Matthew Ball, managing partner of EpyllionCo and McKinsey knowledge partner, said on McKinsey’s *At the Edge* podcast. “Well, Web3, by definition, succeeds Web 2.0. The metaverse, by definition, succeeds our current computing and networking paradigm. The fact that they both succeed what we experience as the internet today naturally intertwines the two.”

The metaverse is not only for a small group of users

We have already noted there are three billion gamers in the world, spanning geographies, generations, and genders. For instance, the gaming platform *Roblox* reportedly had nearly 55 million daily average users (DAUs) in February 2022[12] and generated $1.9 billion in revenue in 2021.[13] *Minecraft* has about 140 million monthly active users,[14] and *Fortnite* about 80 million.[15] Gaming has acclimated consumers to the concept of the metaverse: our survey found the share of millennials very excited about the metaverse

Advances from Web 2.0 to Web3 give rise to the metaverse.

		Web 2.0	Web3
	Example virtual worlds	*Second Life* *Roblox* *Fortnite* *World of Warcraft*	*Decentraland* *The Sandbox* *Somnium Space* *Cryptovoxels*
Platform characteristics	**Organizational structure**	Centrally owned Decisions are based on adding shareholder value	Community governed, generally through a foundation decentralized autonomous organization (DAO) Native tokens are issued and enabled Participation in governance Decisions are based on user consensus
	Data storage	Centralized	Decentralized (game assets)
	Platform format	PC/console Virtual reality/augmented reality hardware Mobile/app	PC/console Virtual reality/augmented reality hardware Mobile/app coming soon
	Payments infrastructure	Traditional payments (eg, credit/debit card)	Crypto wallets
User interaction	**Digital assets ownership**	Leased within platform where purchased	Owned through nonfungible tokens (NFTs)
	Digital assets portability	Locked within platform	Transferable
	Content creators	Game studios and/or developers	Community Game studios and/or developers
	Activities	Socialization Multiplayer games Game streaming Competitive games (eg, e-sports)	Play-to-earn games Experiences Same activities as Web 2.0
	Identity	In-platform avatar	Self-sovereign and interoperable identity Anonymous private-key-based identities
Commercial	**Payments**	In-platform virtual currency (eg, Robux for Roblox)	Cryptocurrencies and tokens
	Content revenues	Platform or app store earns 30% of every game purchased; 70% goes to developer (example model)	Peer-to-peer; developers (content creators) directly earn revenue from sales Users/gamers can earn through play or participation in platform governance Royalties on secondary trades of NFTs to creators

Source: "Opportunities in the metaverse: How businesses can explore the metaverse and navigate the hype vs. reality," Onyx by J.P. Morgan, JPMorgan.com, January 19, 2022

(35 percent and 33 percent respectively) was about 50 percent higher than that of Gen Z.[16] In addition, we found a relatively even split between metaverse users by gender: 53 percent of our respondents identified as men; 46 percent identified as women. While overall excitement levels were consistent, there were some differences in the metaverse activities each gender was excited by. Respondents identifying as men prioritized connectivity with people and purchasing real estate, while those identifying as women were most excited by the ability to customize avatars and attend concerts and events.

The building blocks of the metaverse

Having explored what the metaverse is not, it is time to dive into what it actually *is*. As a concept, the metaverse can be broken down into four core building blocks: content and experiences, platforms, infrastructure and hardware, and enablers. Importantly, capital is flowing into this technology stack, across ten component "layers" that constitute the physical and operational structure on which all metaverse experiences are based—these range from back-end tech enablers (such as engines, blockchain, and hardware devices) to platforms and virtual worlds (Exhibit 1). We also anticipate the development and scaling of standards and protocols to enable interoperability.

A big question is whether these building blocks and the layers they comprise will combine to form the metaverse, at least as many envision it. That our digital lives are becoming more complex, immersive, and

Meeting the technology demands of the metaverse

The technology required to power the metaverse is recent. Yet the technology required to truly realize its potential doesn't exist and presents arguably the greatest challenge to the development of the metaverse of people's imaginations. The bottom line is that advancements will be required in compute infrastructure, network infrastructure, and devices:

— **Compute infrastructure.** Limits of concurrency today cap the number of players on gaming experiences without creative workarounds such as spacing players across a map to avoid overloading processing resources. In a fully realized metaverse, many more users will need to be able to be online at once. In addition, *low-quality rendering* means devices without graphics processing units (such as smartphones) cannot present the photorealistic environments required to drive immersion.

— **Network infrastructure.** There are two common issues with network infrastructure today. High-latency "lagging" creates a sensation of video and/or audio being slow when using applications that require a high rate of frames-per-second, such as gaming and metaverse socializing. And low-bandwidth "buffering" occurs when data cannot be transferred quickly enough, delaying access to content or stopping it when it is already in progress.

— **Interface hardware.** Metaverse access today is primarily through flat screens: televisions, computers (PCs and laptops), and smartphones. We expect them to dominate for another five years before transitioning to AR/VR and eventually extended reality (XR). It is unclear what will shape the next wave of metaverse interfaces: for example, if mobile phones evolve quickly enough to enable AR and become the main way of accessing the metaverse, access may become more democratized. Yet significant advancements across all features of AR/VR are required as the metaverse develops, and we don't expect mainstream XR devices—such as contact lenses and brain-computer interfaces—to emerge for at least a decade. Additionally, a broad set of peripherals—from on- and off-body sensors to haptics—are still emerging, and have the potential to significantly expand the market.

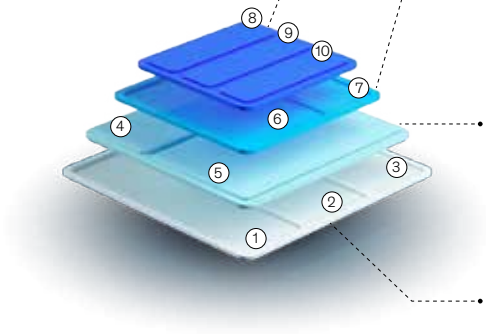
pervasive seems clear. Yet that does not mean the metaverse is guaranteed to develop into a melding of our physical and digital lives.

While incumbents are always at risk of being disrupted by innovation,[17] there are questions about the ability of current technology to result in a fully realized metaverse, particularly when it comes to issues of speed and capacity (see sidebar "Meeting the technology demands of the metaverse"). There's also the issue of the user experience and how that may help—or hurt—the metaverse's adoption and development.

"If the metaverse follows the app-store model that we have today, a person has to go through the trouble of downloading an app and clicking a lot of permissions—it's a pretty large amount of friction to just try something," Niantic's Hanke said. "If you think about the early days of the web, it was surfing around, checking out 20 different websites at a session. They weren't things that kept your attention for hours and hours or that you were loyal to for years, but it was very easy for you to discover and try them. That sort of allowed the whole ecosystem to sort of bootstrap and grow. And I think we need that kind of experience for real-world AR, real-world metaverse."

Exhibit 1

Today's metaverse is made up of ten layers, which fall into four categories.



- **Content & experiences**
  - ⑩ **Content:** Enriches the metaverse experiences—including first-party content, developer content, creator content and UGC, etc
  - ⑨ **Applications:** Tied to specific metaverse use cases—ranging from learning to collaboration to events to industry specific applications
  - ⑧ **Virtual worlds:** Environments where large number of users can gather, interact, create, and move in and out different experiences
- **Platforms**
  - ⑦ **Access and discovery:** Platforms that facilitate distribution and discovery of content, experiences, apps—including browsers, search/visual search, app stores, in-app storefronts
  - ⑥ **Creators/3D development platforms:** Core set of tools and platforms for building 3-D experiences—including design, game engines, AI services, creator tools
- **Infrastructure and hardware**
  - ⑤ **Devices, OS and accessories:** Device hardware, components, accessories/peripherals and OS layers that are part of the human interface layer
  - ④ **Infrastructure:** Underlying infrastructure across cloud, semiconductors, networks, etc that powers the metaverse
- **Enablers**
  - ③ **Security, privacy, and governance:** Security, identity and data governance, privacy, and content moderation platforms
  - ② **Identity:** Platforms that manage digital identity, avatars and social graphs
  - ① **Payments and monetization:** Platforms and tools (eg, advertising, asset stores) to enable the metaverse economy

‘Web3, by definition, succeeds Web 2.0. The metaverse, by definition, succeeds our current computing and networking paradigm. The fact that they both succeed what we experience as the internet today naturally intertwines the two.’

—Matthew Ball, managing partner of EpyllionCo and McKinsey knowledge partner

One example of this today is the ability to move between different websites within the same browser (or tab). Applications and games are largely distinct, stand-alone experiences with limited interoperability. Yet many news sites, for example, provide hyperlinks from articles to external destinations, including competing news sources, allowing the user to seamlessly navigate to new websites.

Every industry faces questions about whether and to what extent the metaverse may impact it, which in turn raises questions about how companies respond. Issues of privacy and security are only likely to intensify as the metaverse develops, raising questions for companies and governments alike. And the broader issue of negative externalities—such as its potential societal impact—remain to be answered. As Digital Play, LEGO Ventures managing director Rob Lowe told us, the ambition is “for the future to become as open as the internet was when it was first launched.” He said, “That is is the kind of promise of what a future metaverse could be for everybody, not this idea of individual, siloed experiences.”

With each generation of screen technology, we’ve become closer to content: from televisions 12-feet away, across the room, to personal computers three-feet away, to mobile devices just a foot from our eyes. And with each shift, the degree of personalization and advertising revenue has increased—along with the time we spend with devices, and their second-order social consequences. We may one day experience the metaverse through glasses, contact lenses, and embedded technology. What may the future hold as we move to fully immersive experiences?

2

Following the money: What is driving investment?

Interest in the metaverse has exploded. Global Google searches for "metaverse" skyrocketed 7,200 percent last year,[18] and metaverse online gaming platform *Roblox* reportedly hit over 55 million daily active users in February 2022.[19] Meta committed more than $10 billion into its Reality Labs division,[20] which makes metaverse-related hardware such as VR goggles. And Microsoft said its planned $69 billion acquisition of gaming company Activision Blizzard would "provide building blocks for the metaverse."[21]

Yet this booming interest has also made it difficult to separate hype from reality. This has always been the case since the advent of the internet, or indeed all technological innovation. We go through periods of heightened excitement about what is possible and may evolve, and it is hard today to avoid thinking back to the early, tumultuous days of the internet. However, it is also worth remembering that while the bust of the first dot-com boom resulted in the disappearance of scores of companies, the internet itself only became ubiquitous.

18 **Value creation in the metaverse: The real business of the virtual world**

Beneath the hype, the metaverse's development continues (Exhibit 2). *Roblox*, launched in 2006, has attracted companies including Nike[22] and Gucci[23] as advertisers and partners. *Fortnite* has more than 20 million daily active users (DAUs), has hosted concerts (more than 27 million unique players attended a Travis Scott performance last April[24]), and generated more than $14 billion in transactions between 2018 and 2020.[25] Naver Z's *Zepeto*—Asia's largest metaverse platform—has over 300 million global subscribers,[26] and in April partnered with Samsung for its Galaxy S22 Treasure Hunt campaign.[27]

Virtual real estate has also been in the spotlight—an anonymous user reportedly paid $450,000 to purchase a plot of virtual land in *The Sandbox* next to Snoop Dogg's virtual residence, "Snoopverse."[28] Institutional investors cover a wide range, including brands like Adidas, Samsung, HSBC,[29] and a fast-growing crop of virtual real-estate companies like Republic Realm and Metaverse Group (majority owned by Tokens.com).[30] And the supporting infrastructure is also quickly evolving, including virtual architecture and advisory firms. Yet price increases are driven by scarcity that is designed into present-day platforms like *Decentraland* and *The Sandbox*. That heightens the investment risk involved, even if organizations making the investments aim to derive utility from their virtual real estate by, for instance, using it as their metaverse base of consumer interactions. Their bet is not only on mass adoption of the metaverse in the coming years, but also on adoption of the specific platform that the virtual land is bought in (given near-zero interoperability between worlds for now). As with cryptocurrency and NFTs, the virtual real-estate asset market will likely remain volatile in the near term.

In the meantime, while there may be consolidation in the future, the list of metaverse platforms continues to grow and diversify.

Charting the acceleration of investment

Investment in new technologies does not necessarily guarantee their eventual success, although it does underscore the extent to which companies and institutions have evaluated an opportunity and concluded it is worth pursuing. More than $120 billion has flowed into the metaverse space already in 2022—more than double the $57 million of 2021[31]—as large technology companies, start-ups, and established brands

Exhibit 2

The metaverse is a developing opportunity.

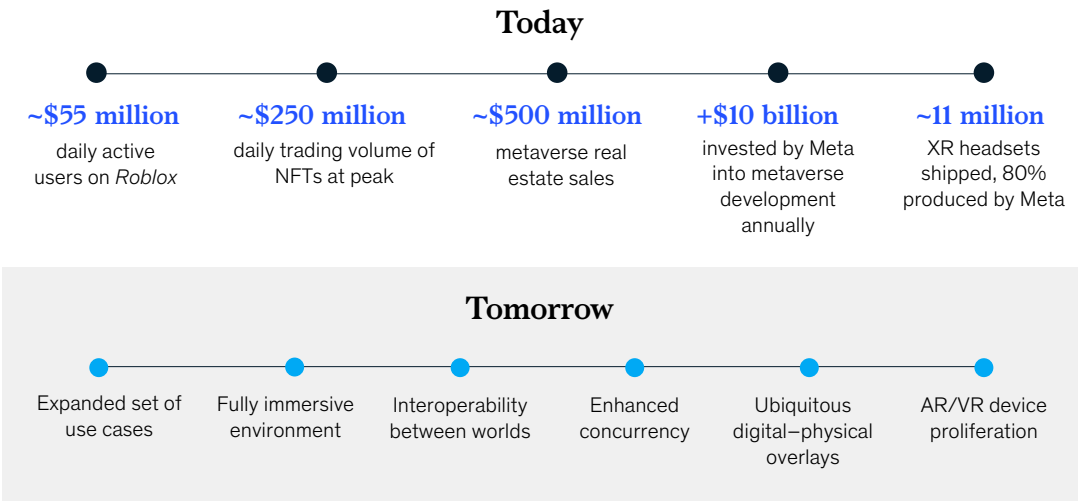
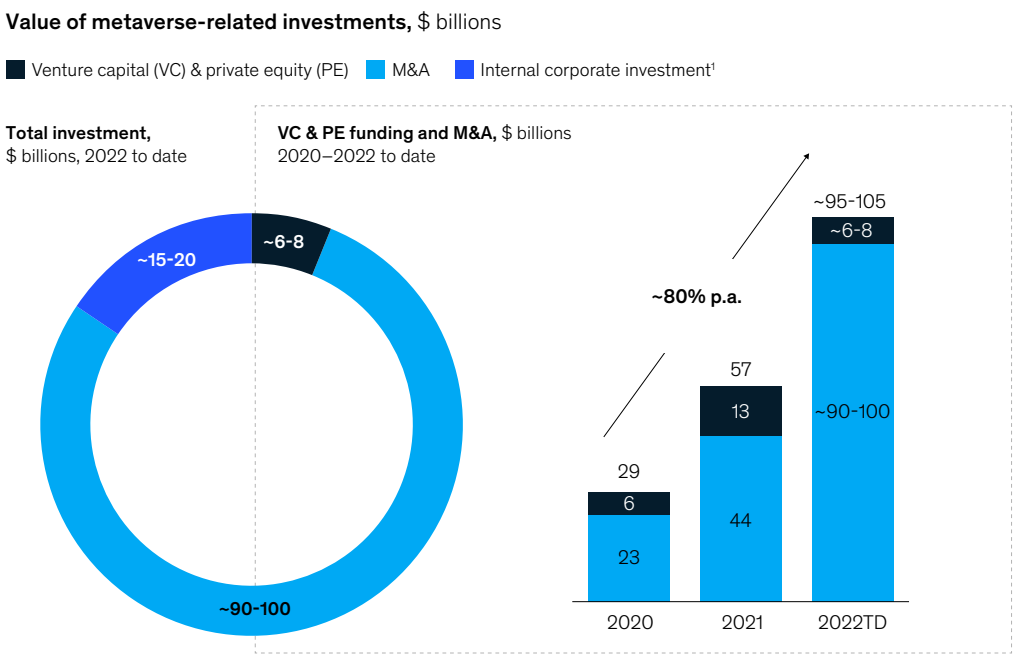


Exhibit 3

Substantial investment signals confidence in the potential of the metaverse.



[1]Internal corporate investment in 2022 derived for top 30 companies investing in the metaverse based on publicly announced investment amounts.
Source: Crunchbase (Jan 2020–May 2022)

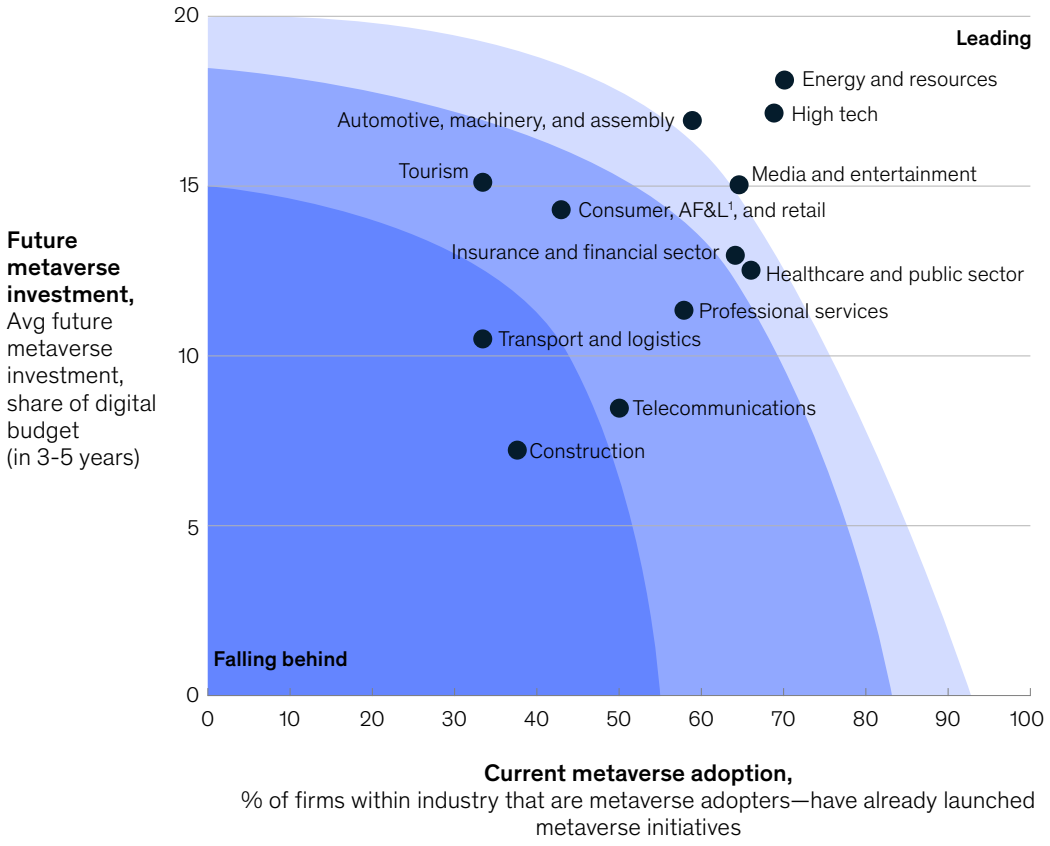
seek to capitalize on the growth opportunity (Exhibit 3). For example, Andreessen Horowitz recently launched Games Fund One, releasing $600 million in venture capital to invest in game studios, metaverse infrastructure, and games themselves.[32] It is also worth noting that cryptocurrencies—while not the same as the metaverse—saw investment of more than $30 billion in 2021. The common element seems to be an underlying belief among investors that our technology paradigm is about to undergo a major reset (see sidebar "The metaverse and Web3," page 26).

Total metaverse-related investment is also proving to be significantly larger than it was for AI, which attracted $39 billion in investment in 2016—arguably a similar stage in its development trajectory to the metaverse today. While total VC and PE investment is somewhat comparable—AI was $6 billion to $9 billion in 2016; the metaverse is $6 billion to $8 billion so far this year—M&A activity is much bigger. We attribute this to the fact the metaverse has emerged, for the most part, as a pure digital play for many companies, exemplified by Microsoft's intended purchase of Activision Blizzard for around $69 billion.[33]

Meanwhile, the sectors leading metaverse adoption also plan to dedicate a significant share of their digital investment budgets to the metaverse with energy (18 percent); automotive, machinery, and assembly (17 percent); high tech (17 percent); tourism (15 percent); and media and entertainment (15 percent) among those leading the charge in terms of allocating share of digital budget to metaverse-related activity over the next three to five years (Exhibit 4).

Exhibit 4

Sectors leading metaverse adoption today also plan to dedicate a significant share of their digital investment budgets to metaverse.



[1]Apparel, footwear, and luxury.
Source: McKinsey & Company Senior Executive Survey, April 2022

The broader investment landscape is dominated by three categories of investors:

— **Large technology companies,** including for example Meta, Microsoft, Nvidia, Apple, and Alphabet, among others, are taking deliberate actions toward shaping the metaverse. The most prominent example is Facebook's name change to Meta, solidifying its intent to become a leader in the space, but others include Microsoft's intended Activision Blizzard acquisition,[34] Nvidia's Omniverse,[35] the planned release late this year of Sony's PlayStation VR2 headset,[36] and the possibility of Apple entering the AR space in 2023.[37]

— **Venture capital** is investing heavily in the space. Examples include NFT marketplace OpenSea raising $300 million at a $13.3 billion valuation in a Series-C funding round led by Paradigm and Coatue,[38] metaverse technology company Improbable raising $150 million led by Andreessen Horowitz and SoftBank,[39] Yuga Labs (creator of the Bored Ape Yacht Club) raising $450 million at a $4 billion valuation to build a virtual world,[40] *The Sandbox* receiving $93 million from SoftBank,[41] and Niantic receiving $300 million from Coatue.[42]

— **Corporations and brands** outside of tech are putting resources behind efforts to get ahead. Disney appointed a senior executive to oversee its metaverse strategy,[43] for instance, while LEGO invested in Epic Games (makers of *Fortnite*).[44] Epic Games also collaborated with luxury brand Balenciaga, which has created a dedicated metaverse division and launched its latest collection inside a virtual space.[45] The most recent technological trends and advancements such as e-commerce, smart devices, and social media are arguably starting to reach a point of declining returns in terms of their ability to generate a competitive advantage. In response, brands are seeking innovative ways to get ahead of the competition. With its expanding number of use cases, the metaverse offers growth opportunities that first-mover brands are keen to explore and develop.

Of course, the distribution of investments across the metaverse ecosystem can be seen as either troubling or inspiring. It is troubling if you view the metaverse at this point—unlike previous consumer-led revolutions—as generating more excitement among technology companies and executives than from actual consumers. Yet it is inspiring if you view the involvement of brands as a sign that they have learned from previous consumer-led revolutions and want to be involved earlier this time around.

"What does this mean collectively? It means that this idea that we've thought of for decades is now a little bit more tangible, even if in the virtual sense," McKinsey senior adviser Ball said. "There are hundreds of millions of people connecting to these environments every day. There are many of the most storied companies on earth building a presence, and we have commerce in the tens and soon to be hundreds of billions of dollars."

In fact, this idea of connecting virtually that has been decades in the making is now increasingly real: as of October 2021, Facebook had almost three billion users in virtual platforms, with gaming and e-sports attracting a quarter of a billion and global crypto not far behind at 220 million. Decentralized finance and blockchain gaming garnered 3.45 million and 2.36 million users respectively, while there are close to half a million users of NFT platforms and approximately 50,000 users engaging in Web3 virtual worlds.[46]

Like the current version of the internet, the metaverse is expected to show significant network and synergy effects, meaning the value of each individual metaverse feature (such as owning digital assets) will increase with the amount of use cases and consumer offerings. This means a fully integrated, end-to-end ecosystem must be built if the metaverse is to reach its full value proposition.

Factors driving investor enthusiasm

Although the long-term vision of the metaverse is still to be realized, the early version of the metaverse is well established. More than three billion gamers globally are fueling it, and that proof of concept makes a difference for investors. In fact, there are multiple factors driving their enthusiasm and the growing belief we are at an inflection point where the metaverse as many imagine it will begin to materialize.

Ongoing technological advances

The infrastructure required to run the metaverse has rapidly improved and opened new possibilities. While significant technology challenges remain (see sidebar "Meeting the technology demands of the metaverse"), we have already seen blockchain spark the decentralized creator economy and emerge as the most promising current technology for achieving the promise of the future metaverse for interoperability between worlds. The full rollout of 5G (and beyond) will enable processing these large worlds on mobile devices.[47] A number of other advances will facilitate development of the metaverse:

— **Back-end engines erode barriers to creation.** The improved availability of the back-end engines that drive the user experience (in particular Unreal Engine and Unity) have reduced the barrier to creation,

as a wider audience of studios and creators have gained access to creating advanced games and experiences.[48] This advancement is critical to the metaverse, as it enables the shift from more traditional 2-D internet spaces to more immersive experiences.

— **Edge computing powers the metaverse.** Edge computing, also known as multi-access edge computing or mobile edge computing, will play an important role in driving the computing power required to run the metaverse. At its core, edge computing enables data to be captured, stored, and processed locally across smart devices and local networks rather than in the cloud.[49] By obviating the need to send data to the cloud to be processed, edge computing helps solve problems of limited bandwidth and latency—critical for an immersive, high-fidelity experience.

— **5G will play a defining role.** 5G technology solves the need for faster networks with lower latency to enable vastly more connected devices to process data, including VR headsets or AI-powered bots that will open up experiences such as the sense of touch, and AR that lets visitors have in-depth conversations with AI hosts.[50] The full rollout of 5G is regarded as critical to facilitating edge computing, although there is already discussion about the potential of 6G to enable more sophisticated uses of the metaverse.[51]

— **Devices merge the physical and virtual world.** While AR/VR devices aren't yet mainstream, they're maturing fast. Meta shipped 10 million Oculus Quest 2 headsets in 2021,[52] and new devices including gloves and bodysuits—some with haptic feedback—are gaining traction.[53] With companies including Meta, Microsoft, Qualcomm, and Sony leaning into the space, it is not unrealistic to expect a breakthrough in terms of adoption in the near future, as well as additional device types.

— **Software development drives metaverse applications.** Leading software companies are betting on the opportunity to build the "application layer" on top of the infrastructure. For example, Microsoft is currently building and improving upon a number of metaverse enterprise solutions across the Microsoft cloud (such as Dynamics 365 Connected Spaces, Microsoft Mesh, and Azure Digital Twins).[54]

Increasing stakeholder readiness

While gaming is already mainstream (and providing the largest current online worlds in terms of players), additional use cases are emerging rapidly—including new AR/VR-powered social-media experiences, immersive retail, entertainment, sports, and education. "Gaming is already incredibly social and you have continuous innovation of social features," Activision Blizzard chief strategy officer Ken Wee told us.

'Gaming is already incredibly social and you have continuous innovation of social features. But as you're trying to draw in people who don't self-identify as gamers, a more extensive set of social-engagement mechanisms is going to be required to convince them to spend more time in the metaverse.'

–Ken Wee, chief strategy officer at Activision Blizzard

"But as you're trying to draw in people who don't self-identify as gamers, a more extensive set of social-engagement mechanisms is going to be required to convince them to spend more time in the metaverse."

Company activity

Brands are also experimenting: luxury-goods company Gucci has a presence across many platforms,[55] Nike has Nikeland in *Roblox*,[56] and fast-food company Wendy's has had an event in *Fortnite* and has a presence on *Horizon Worlds*.[57] In addition, less-talked-about but sizable enterprise use cases also continue to scale, including specific categories such as retail, healthcare, and manufacturing, and also cross-sector examples such as learning and development, remote collaboration, conferences and events, and customer support.

Consumer uses

We only expect more examples as the metaverse matures. "Use cases beyond gaming are not just in the future, they're already emerging," the founder and CEO of XR Safety Initiative Kavya Pearlman told us. "According to the United Nations, 1.6 billion children moved to online learning with the pandemic,[58] so this is an area ripe for disruption where many people are looking for alternatives. We're also seeing a lot of experimentation within the medical field, such as using HoloLens for assisted surgeries."

We envision the fully developed, long-term version of the metaverse to encompass most daily activities, spanning five core categories:

1. **Gaming** has been driving the development of the metaverse.
2. **Socializing** extends existing consumer behavior through platforms such as *Decentraland*, *The Sandbox*, and *Second Life.*
3. **Fitness** often marries gaming and connectivity through providers such as Peloton.
4. **Commerce** includes Sotheby's proprietary marketplace for curated NFT art,[59] virtual-only fashion company Fabricant,[60] as well as start-ups promoting an immersive retail experience, including Obsess[61] and AnamXR.[62] A primary question is whether the metaverse can be a channel for selling real products at scale, and emerging technology enabling thousands of people to simultaneously interact may help.[63]
5. **Remote learning** remotely groups individuals in virtual classrooms.

The metaverse also has the potential to impact sectors Ball describes as "categories that have long avoided digital disruption." "My hope is that the metaverse and VR and AR will finally start to show actual, tangible, measurable productivity improvements in education and healthcare," he said.

'Use cases beyond gaming are not just in the future, they're already emerging.'

–Kavya Pearlman, founder and CEO of XR Safety Initiative

Enterprise solutions
The metaverse will enable incremental improvements in the enterprise solutions we know today alongside entirely new innovations. Notable categories include the following:

— **Enhanced remote collaboration:** An incremental improvement will see a move from 2-D screens to an immersive 3-D space as online meetings in the metaverse further enable remote work and potentially diminish the need for co-locating.[64] As we move toward this transition, we expect to see a continuation of the pandemic-induced rethinking of how organizations are structured.

— **Reimagined learning and development:** Simulations of real-life settings and situations will allow for a far more captivating learning process, opening possibilities both in onboarding new colleagues and developing current personnel, which is increasingly important for organizations competing for talent on a global scale.

— **Digital twins:** We are also seeing new innovations such as BMW's effort to build a digital factory twin on Nvidia Omniverse,[65] which is expected to drive efficiency improvements across its supply chain. By building virtual replicas of physical settings and objects that generate data in real-time, far richer analyses can be generated than previously to enable improved decision making.

Business agendas and larger tech investments will likely focus on those that move the productivity needle, such as automation and process visualization. Today, 50 percent of our work activities can be improved with these technologies, which include robotics, digital twins, and 3-D or 4-D printing.[66]

Public-sector activity
There is also a rapid expansion of use cases in the public sector. For instance, Dubai's Virtual Assets Regulatory Authority earlier this year established Metaverse HQ on *The Sandbox*,[67] making it the first regulator in the emerging digital space. The Dubai Metaverse Strategy estimates the metaverse will add $4 billion to its economy and support 42,000 jobs by 2030.[68]

'We believe that with the metaverse we can create higher-quality government services. Current government services are demand driven. However, we believe that in the future we can provide services in advance of demand—we can provide a new form of government services and, in that sense, it will be very helpful to citizens. We also believe this metaverse platform will help citizens see Seoul city in a different perspective.'

–Jong-Soo Park, CIO of Seoul's Smart City Police Bureau

The first city government is also set to join the metaverse: leaders in South Korea's capital, Seoul, announced a five-year "Metaverse Seoul Basic Plan" that will begin by creating a virtual Seoul City Hall, plaza, and civil-service center. The CIO of Seoul's Smart City Policy Bureau, Jong-Soo Park, told us the objective was to "provide civic freedom, participation, engagement, and communication."

"We believe that with the metaverse we can create higher-quality government services," he said. "Current government services are demand driven. However, we believe that in the future we can provide services in advance of demand—we can provide a new form of government services and, in that sense, it will be very helpful to citizens. We also believe this metaverse platform will help citizens see Seoul city in a different perspective."

There are also emerging examples of using the metaverse to address social issues, such as the Whole Earth Foundation's Guardians of Metal and Concrete game,[69] which crowdsources data collection to

The metaverse and Web3

While the metaverse is opening new opportunities for creators to create and users to engage and experience, the Web3-enabled metaverse advances these opportunities with a new paradigm.

Web3 heralds a new decentralized ecosystem, in which users begin to own, monetize, and utilize their data for their own benefit, and creators can monetize their content and talents in different ways. It's enabled by three core technologies:

- *blockchain* offering a universal, public, permanent, single source of truth
- *digital assets* issued on a blockchain, representing value portability and permanence
- *smart contracts* containing conditional programming code that create utility by facilitating self-executing applications

As a result, metaverse applications built on Web3 benefit from more permanence, functionality, and interoperability than more traditional Web 2.0 VR experiences.

Since digital assets are a core component of the Web3 technology stack, access to these is central to future metaverse design. Creators can freely launch new digital assets on any blockchain they desire and distribute these assets via Web3-native marketplaces with dramatically lower fee models than their Web 2.0 equivalents. In addition, the advent of noncustodial wallets enables users to access their digital possessions by connecting their wallet to each metaverse venue. Digital assets in such wallets can include cryptocurrencies, digital equities, stablecoins,[76] and NFTs in the form of skins, tools, and even virtual real estate. Assets are typically issued on the same blockchain as the metaverse venue (for example, Ethereum, Polygon), but cross-chain bridges are enabling greater portability of digital assets between different metaverse venues.

Finally, core services will need to evolve alongside emerging technologies in order for the Web3 metaverse to fulfill its potential. Since much is typically based on open-source and composable code (classes and functions that can be combined to become building blocks of larger systems), we expect the Web3 metaverse to advance rapidly, through steps including the following:

- creating solutions to enable the digital identification of users crossing over from the physical to virtual worlds
- improving the user interface and user experience of the wallet experience, such as replacing traditional keys and addresses with more familiar naming conventions
- advancing the graphical user interface of metaverse venues, from current 2-D renderings and controls that can be clunky, to a more immersive VR-like experience
- expanding the utility of Web3 metaverse venues to generate true value, such as unique access to resources and experiences

The extent of untapped opportunity and accelerating pace of development make the Web3-enabled metaverse a subject senior executives need to keep an eye on.

‘It’s going to be important to create a truly creator-focused economy in the open metaverse, where creators can realize the value of their creations and not just be at the mercy of a gatekeeper that takes all the profit off the top because they are at the gate and they can do it.’

–Marc Petit, VP of Epic Games’ Unreal Engine Ecosystem

capture infrastructure conditions in real time so repairs can be made.[70] “I’m quite interested in the aspect of blockchain as an incentive scheme,” Square Enix’s Yosuke Matsuda said, referring to the game. “It’s trying to solve social issues with games using the incentive scheme of blockchain. This is opening up whole new possibilities.”

Demographic tailwinds

If gaming is the forerunner of who uses the metaverse, the trends are positive: gaming demographics are widening across age and gender. As of 2020, 48 percent of all gamers in China[71] and 41 percent of all US video-game players identified as female.[72] In addition, data from the United States show 79 percent of video-game players in 2020 were over the age of 18 and 41 percent older than 35.[73] In addition, Gen Z consumers—the oldest of which are in their mid-20s—are increasingly an income-earning force to be reckoned with and are more familiar with virtual worlds and lives.

A global community of independent developers and creators

Developing immersive, engaging content is increasingly shifting toward individual content creators—evident in the more than 50 percent increase in “influencer” marketing over the past five years across platforms from China’s WeChat and Pinduoduo to YouTube and Instagram in the Western world. This bodes well for growth of the metaverse, as a significant share of innovative, engaging experiences will likely come from these creator-users.

A thriving creator economy has emerged, powering user-generated content diversity across virtual platforms. As demonstrated by the rise of social media and games based on user-generated content, we are seeing increased demand for digital self-expression and co-creation of virtual environments. “Most game companies like us have been focused on creating content, but the metaverse will expand the possibility and ease of providing the space for players to contribute and create,” Yosuke Matsuda said. A survey of US consumers shows about 70 percent of general consumers (Gen Z to Gen X) rate their digital identity as “somewhat important” or “very important.”[74] We expect the creator economy to see further tailwinds as decentralized Web3 platforms emerge.

“It’s going to be important to create a truly creator-focused economy in the open metaverse, where creators can realize the value of their creations and not just be at the mercy of a gatekeeper that takes all

'It's a virtual immersion into the next generation of the internet. The metaverse will be iterative, not any one size or shape. And the capabilities we have within it will all be unlocked by both open standards and the devices that we wear or that we use to interact in these worlds.'

—Brian Solis, global innovation evangelist at Salesforce

the profit off the top because they are at the gate and they can do it," the vice president of Epic Games' Unreal Engine Ecosystem, Marc Petit, told us. "We have to create a new generation of platforms that implement a better economy for creators. And that's where, for me, things need to be fair, open, and interoperable. The technicality of making fully simulated worlds move from one platform to another is complex but give us a few years and we'll figure it out."

Growing consumer openness to a new kind of internet

Consumers are increasingly expressing discontent with many aspects of the internet as it has evolved today, from the proliferation of misinformation to data and privacy concerns, how social-media platforms generate user dependence, and their effect on users' mental health. In parallel, creators are increasingly expressing discontent with the way in which content is monetized and proceeds distributed. Both trends are contributing to the Web3 movement gaining momentum globally, with the result potentially a major disruption in value pools—which is why investors are staking a position early (see sidebar "The metaverse and Web3"). "Every brand is going to go in and negotiate with every aspiring metaverse operator [...] and negotiate terms that ensure they can have a direct customer relationship," Epic Games CEO Tim Sweeney told the *Financial Times*[75] with regard to how the economics may change. "We know this because we were talking to all these companies and they're all very consistent and adamant about remaining first-class citizens in the metaverse and not being intermediated by any company they partner with."

The metaverse sits at this inflection point in its evolution due to factors ranging from the size of the opportunity to drivers of expected growth and the amount being invested. We believe the intense interest of the past year ignited dramatic corporate experimentation which has laid a foundation for the metaverse's evolution and will likely maintain momentum for the foreseeable future. "It's a virtual immersion into the next generation of the internet," Salesforce global innovation evangelist Brian Solis told us. "The metaverse will be iterative, not any one size or shape. And the capabilities we have within it will all be unlocked by both open standards and the devices that we wear or that we use to interact in these worlds."

3

Scanning the horizon: How is consumer and business behavior evolving?

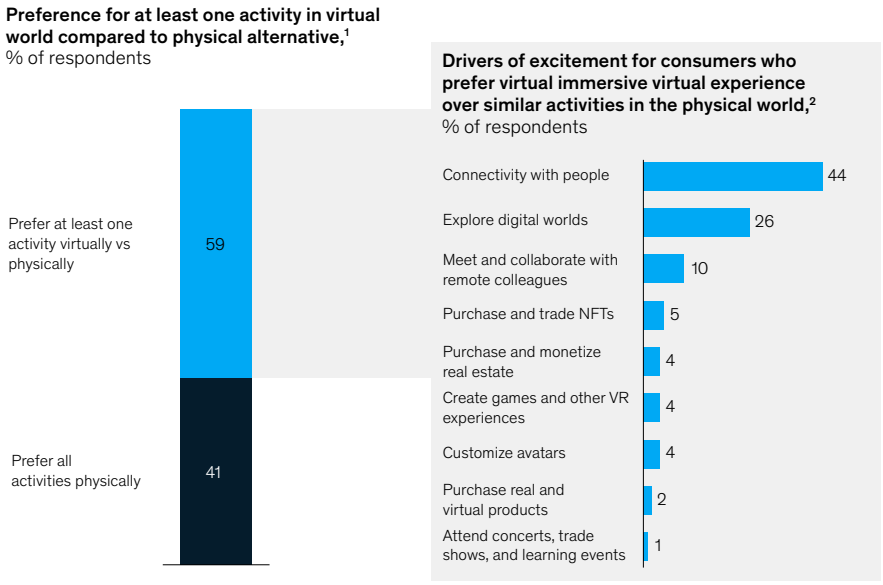
We have eagerly adopted technology for decades, both personally and professionally. In the past two years alone, many have rapidly and largely seamlessly adjusted to carrying out more daily activities virtually both on the job (videoconferencing) and in private (socializing, dating), while the pandemic also swiftly accelerated the adoption of e-commerce, and we relied more than ever on technology to live our lives. Our research finds consumers and executives are excited about what is next, with many already using and experimenting with the metaverse and eager to realize its potential. Yet even as many companies and industries push the digital frontier, others remain hesitant.

How consumers view the metaverse

Almost 60 percent of consumers we surveyed are excited about the transition of everyday activities to the metaverse (Exhibit 5), with connectivity being the number one driver of excitement. What kind of connectivity are we talking about? When we asked consumers what they hoped to be doing in the metaverse within the next five years, for many the answer was socializing and communicating with family and friends (see sidebar “Our research methodology”).

Exhibit 5

Approximately 60 percent of consumers are excited about the transition of everyday activities to the metaverse.



[1]Q: *When you participate in the metaverse, do you prefer that virtual experience over the same activities in the physical world?* (n=2,939).
[2]Only for respondents who preferred at least one activity in the immersive virtual world compared to physical alternative; Q: *What gets you most excited about participation in the metaverse?* (n=1,210).
Source: Intelli Metaverse Consumer Survey in Europe, the Middle East, and Asia (EMEA) and Asia–Pacific (APAC) (April 2022)

Our research methodology

Both quantitative and qualitative research informed this report. We surveyed more than 3,000 consumers spanning Asia, Europe, and the United States to gain insight from current users of the metaverse about their motivations, what they are doing, and what they expect to do. We also surveyed almost 450 senior executives across the Asia–Pacific and China, Europe, and the Americas to get a C-level view of the potential growth of the metaverse, as well as actions organizations have put in place or intend to in the years ahead. This was conducted partly to address gaps we identified in a literature review of business leaders' perspective on the metaverse. Finally, we conducted thirteen interviews with senior executives and experts in the metaverse space for deeper insight into how leaders think about this topic, both within their businesses and in their respective industries. Most interviews were conducted in May 2022. For more details on our research, see Appendix C.

Yet connectivity also encompassed a broad range of activities offering commercial growth opportunities, such as entertainment (66 percent of consumers responded they were “excited” or “very excited” about attending live events such as concerts and sports, as well as seeing movies and attending festivals and museums), gaming (66 percent), and shopping (64 percent).

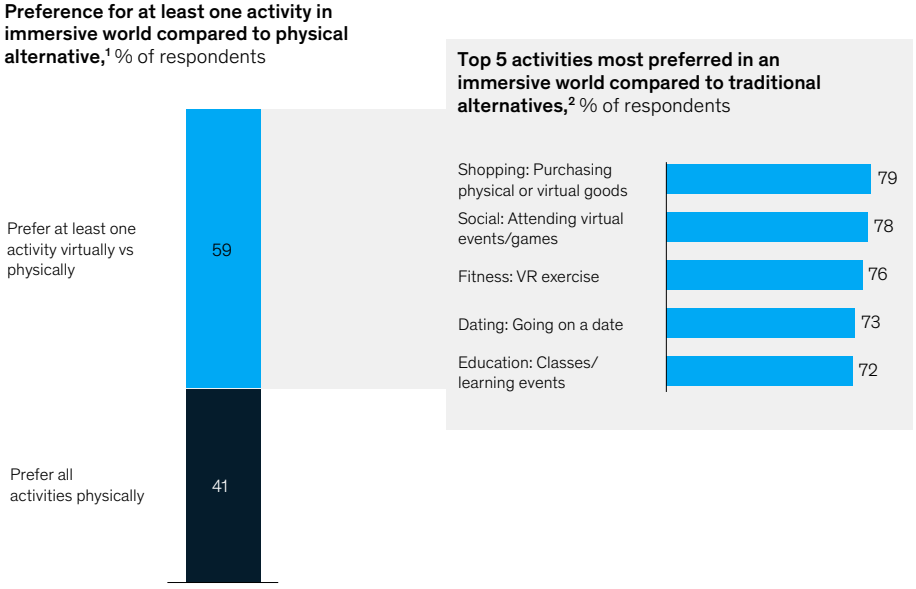
Travel is another activity respondents were “excited” or “very excited” about (62 percent). The main themes in metaverse-specific travel related to the possibility of going beyond the limits of the physical world: time travel, fantastical places, exotic places that are difficult to access, and space travel. The survey also identified strong demand for travel to hospitals and care homes, further underlining the desire for connectivity.

What consumers are doing already

Of the two-thirds of consumers who have experienced the metaverse, our survey found 80 percent appreciate shared virtual experiences with friends and family, 63 percent prefer virtual work meetings, and 59 percent enjoy virtual education sessions more than in-person ones.[77] We also found 62 percent of those using the metaverse had engaged with one or more branded virtual experiences, indicating the opportunity for companies to pursue those efforts.

Exhibit 6

Consumers are looking forward to shifting a range of their activities to the virtual world.



[1]Q: *When you participate in the metaverse, do you prefer that virtual experience over the same activities in the physical world?* (n = 2,939).
[2]Q: *Only for respondents who preferred at least one activity in the immersive virtual world compared to physical alternative; Compared to traditional, non-immersive digital events or activities, how much did you enjoy the following?* (n = 1,210).
Source: Intelli Metaverse Consumer Survey in Europe, the Middle East, and Asia (EMEA) and Asia–Pacific (APAC); Intelli Metaverse Consumer Survey in United States

In addition, the wide adoption of virtual tools has legitimized gaming and virtual socialization, with early metaverse platforms such as *Roblox*, *Minecraft*, and *Fortnite* experiencing accelerated popularity. The conventional core audience for gaming continues to solidify the central role of gaming in today's entertainment landscape: 81 percent of Gen Z have played video games in the past six months, averaging 7.3 hours per week.[78]

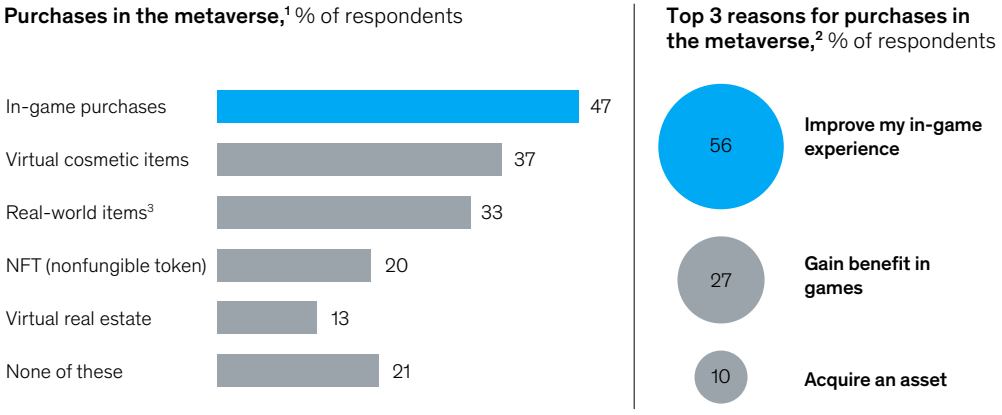
"You're at the point where everyone engages in digital experiences in some way, shape, or form," Activision Blizzard's Wee said. "COVID-19 accelerated it, but I view it as a secular trend that's only grown over the years. You look at our King mobile-gaming business,[79] the audience skews female and is far less likely to self-identify as a video gamer in the traditional sense of the word." That demographic expansion is reflected in the top five activities respondents most prefer in an immersive world compared with traditional alternatives (Exhibit 6).

Omnichannel commerce is now second nature to most consumers, with payment credentials often embedded in the devices and software they use. "Social commerce"—integrating commerce with social-media entertainment—is already estimated to comprise almost 15 percent of total retail in China, and is rapidly growing globally as well. For the three billion gamers in the world today, the virtual goods economy is estimated to comprise nearly 75 percent of global gaming revenues.

That's one reason why we believe consumer spending on digital assets in the metaverse will only grow (Exhibit 7). Another reason? Excitement about the metaverse increases with income: 53 percent of those who identified as higher income were very excited compared with 32 percent of respondents with medium incomes and 25 percent among lower income earners.

Exhibit 7

About 79 percent of consumers active on the metaverse have made a purchase, mainly to enhance their online experience.



[1]Q: *When you are participating in activities in the metaverse, have you purchased any of the following products/services in past 12 months?* (n=2,093).
[2]Q: *What was the main reason for the purchase(s) you made?* (n=1,543).
Source: Intelli Metaverse Consumer Survey in Europe, the Middle East, and Asia (EMEA) and Asia–Pacific (APAC);Remesh Next Gen Consumer – Metaverse Survey in United States

How executives view the metaverse

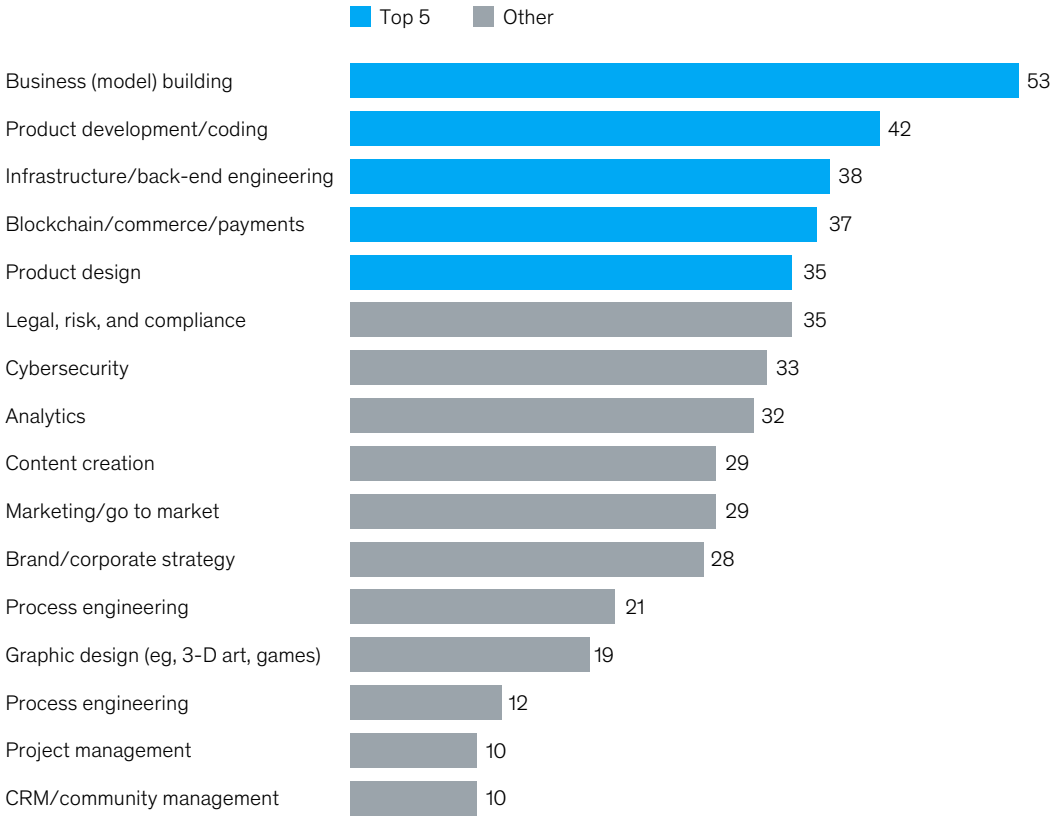
While the metaverse is still evolving, one thing seems clear: senior executives' belief in its potential. Our research found 95 percent of senior executives expect the metaverse to have a positive impact on their industry within five to ten years, and 61 percent expect it to moderately change the way their industry operates (just 7 percent expect no change). In addition, almost two-thirds (65 percent) of senior executives expect metaverse technology to drive more than 5 percent of their organization's total revenue in five years, while 24 percent of executives expect it to drive more than 15 percent of revenue.

While the degree of confidence varies by industry, the findings hint at the size and scale of the opportunity the metaverse presents. Indeed, we found companies with more proactive metaverse adoption were already reporting greater financial success—89 percent of early adopters reported positive operating margins of more than 5 percent, while 21 percent of companies still contemplating whether to become involved reported negative operating profit. And, not surprisingly, innovators were far more likely to expect further improvements in operating profit margins in the next three years.

Exhibit 8

Metaverse adopters are looking for a varied set of capabilities, including content creation, corporate strategy, and cybersecurity.

Top corporate capabilities needed to deliver metaverse strategy,[1] % of senior executives



[1]Q: *What are the top five capabilities that your company needs most in order to deliver your metaverse strategy?* Top 5 capabilities across industries were identified based on these most often mentioned within 'top 5' by executives (n = 448).
Source: McKinsey & Company Senior Executive Survey, April 2022

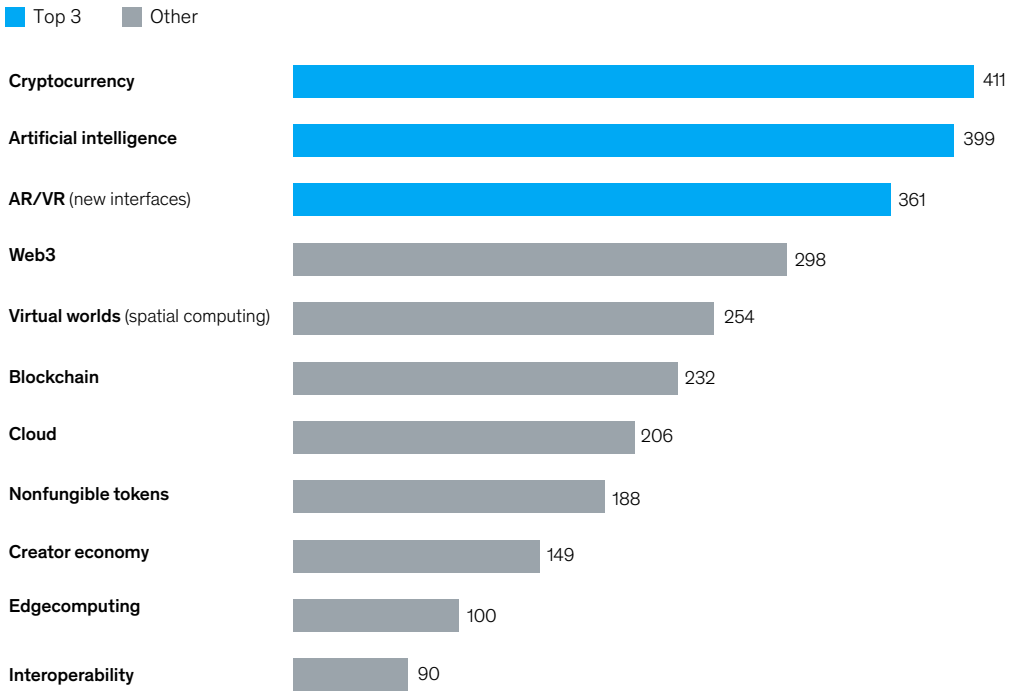
Early adopters are also seeking different capabilities compared with their peers (Exhibit 8). Early adopters are most interested in capabilities around building business models, infrastructure and back-end engineering, blockchain and e-commerce payments, product design, and branding and corporate strategy. Contemplators share building business models, infrastructure and back-end engineering, and product design among their top five capability needs, but also require legal, risk, and compliance expertise, as well as analytics.

While we found metaverse adopters have to date most commonly implemented marketing campaigns or initiatives, some 63 percent have undertaken learning and development for employees and 53 percent have held virtual meetings. The least-used metaverse initiatives were recruiting or on-boarding new employees (31 percent) and allowing customers to pay with cryptocurrencies (22 percent). Yet executives are most bullish about cryptocurrencies as a metaverse technology (Exhibit 9).

Exhibit 9

Looking ahead, executives consider cryptocurrency, AI, and AR/VR the top three metaverse technologies.

Top 3 metaverse technologies, points-based ranking[1]

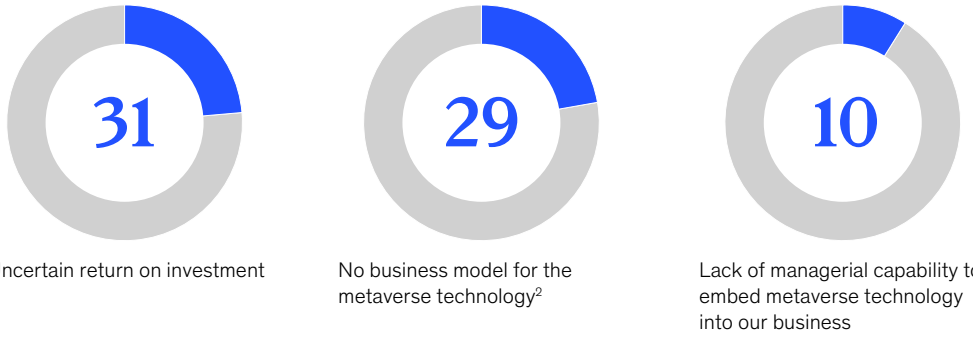


[1]Q: *What do you consider the top three metaverse technologies for businesses in the future?* (Rank top 3); Points ranking assigned with 3 points for every 1st ranked technology, 2 points for 2nd, 1 point for 3rd (n = 448).
Source: McKinsey & Company Senior Executive Survey, April 2022

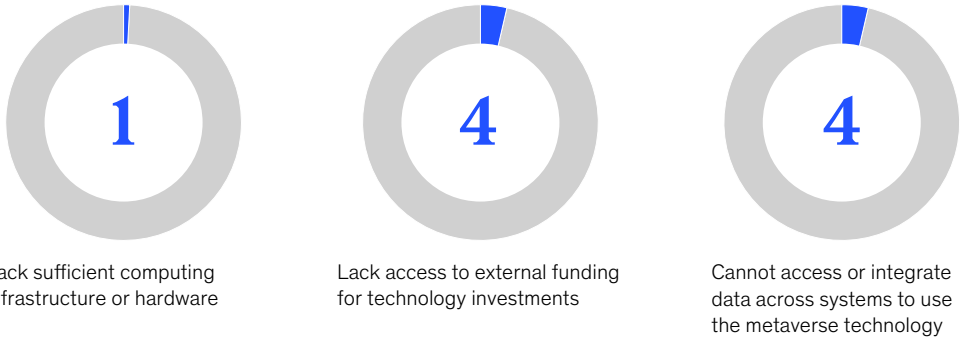
Exhibit 10

Executives highlight revenue uncertainty as a key barrier and worry less about the technology involved.

Top 3 barriers to entry, % of senior executives[1]



Bottom 3 barriers to entry, % of senior executives[1]



[1]Q: *What are the top three barriers for your company when adopting metaverse technology?* Top 3 barriers across industries were identified based answer most often indicated as top 1 barrier (n=448).
[2]Defined as core profit-making plan, or the way monetary value will be delivered.
Source: : McKinsey & Company Senior Executive Survey, April 2022

Senior executives with high confidence in the metaverse driving revenue impact are already building capabilities within their organizations. Yet respondents also cited several barriers to entry to the metaverse, despite expressing less concern about required technology (Exhibit 10). In addition, senior executives raised several risks that need to be addressed if the metaverse is to be successfully adopted. The top two were data privacy and cybersecurity (86 percent and 85 percent respectively), followed by ethics and regulatory compliance (60 percent), technological limitations (53 percent), brand image (45 percent), and payment safety (40 percent).

4

Envisioning the potential: How significant could the metaverse's impact be?

History has no shortage of revolutionary ideas that fail to materialize, or take much longer than expected. For all of the developments in AI technology in the past two decades—and its seeming ubiquity today—it took the better part of 80 years for AI to mature, having formally emerged as a concept during World War II.

The metaverse will likely be different. While it is in its early stages and far from its potential end state, the metaverse's underlying technology already exists. Users are accustomed to what it currently provides—and excited about what it could become. And, crucially, early metaverse adopters are organizing themselves differently to move at speed as it evolves.

A possible $5 trillion impact

A few years ago, investment in artificial intelligence was estimated at up to $10 billion. It is now $93 billion.[80] We expect the economic value of the metaverse to rise exponentially, driven by several factors: its appeal spans genders, geographies, and generations; consumers are ready to spend on digital assets (and are doing so already); they are open to adopting new technologies; companies are investing heavily

in the development of metaverse infrastructure; and brands experimenting in the metaverse are reporting positive consumer feedback. This adds up to substantial potential economic value for the metaverse. While estimates vary widely, we forecast it may generate up to $5 trillion by 2030 (Exhibit 11).

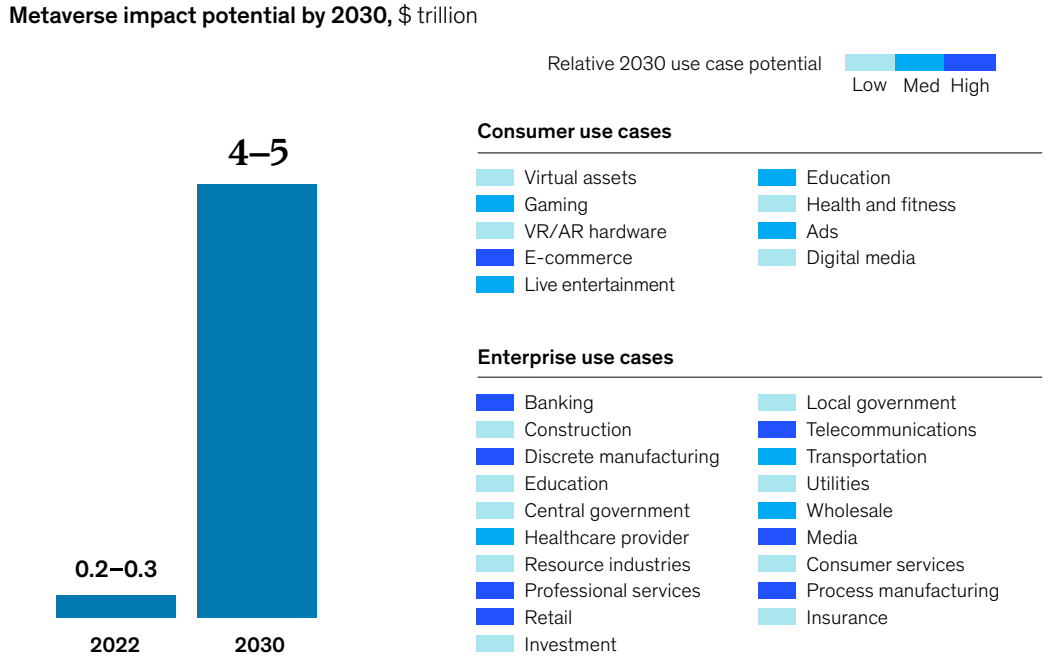
Our estimate of the metaverse's potential impact by 2030 is based on a bottom-up view of consumer and enterprise use cases, derived from discussions with around 20 internal and external experts. The most relevant metaverse use cases during the next decade were identified, with the overall enterprise IT share of spending dedicated to these metaverse use cases estimated and pressure-tested with experts. In short, our forecast is our best estimate given the very high levels of technical, regulatory, and societal uncertainty (for a detailed explanation of the methodology behind our sizing forecast, please refer to the Appendix[81]).

Potential sector implications

The metaverse is also emerging as the biggest new growth opportunity for several industries in the coming decade, given the sheer breadth of potential applications and uses and the degree of investment from large technology companies, venture capital, and corporations and brands. Industries are already implementing metaverse initiatives, although most efforts to date have been centered around marketing;

Exhibit 11

By 2030 the metaverse could generate $4 trillion to $5 trillion across consumer and enterprise use cases.



Source: McKinsey analysis; For a detailed explanation of the methodology behind our sizing forecast, please refer to Appendix B

learning and development for employees; virtual meetings, events, or conferences; and product design or digital twinning (Exhibit 12).

There is no shortage of examples of how companies are experimenting in the metaverse (see sidebar "Leading metaverse use cases"). In the following pages, we examine how five industries are already using the metaverse: apparel, fashion, and luxury; consumer packaged goods; financial services; retail; and telecommunications, media, and technology. We then explore broader societal implications and the metaverse's potential longer-term impact, both positive and negative. These industries are among those most likely to harness the metaverse for both consumer and business uses, where we believe it can generate impact across the value chain.

The opportunity to do this is captured in Exhibit 13, which examines four types of use cases:

— Net-new business models and revenue sources that project a company's penetration further into markets. An example would be retailers using the metaverse to drive the sale of physical products.

— Operations that produce higher productivity and collaboration, and lower costs. In the technology sector, for instance, that may be an efficient digital network of data centers in multiple locations at the same time.

Exhibit 12

Initiative preferences vary by industry; meetings and events are of particular interest to healthcare, and travel, transport, and logistics.

Metaverse initiatives implemented to date, by industry,[1] % of senior executives in each industry

Adoption level: High (>70%); Medium (40–70%); Low (<40%)

Industry	Marketing campaign or initiatives	Learning and development for employees	Meetings in the metaverse	Events or conferences	Product design or digital twinning	Recruiting or onboarding new employees	Customers can pay with crypto currency
Technology	68	64	54	64	54	39	23
Media and telecommunications	82	36	36	43	54	18	25
Advanced industries	64	55	36	64	64	36	9
Financial sector and insurance	67	63	56	49	56	25	31
Consumer, AF&L, and retail	95	56	59	41	50	41	14
Energy and materials	54	85	69	46	69	31	8
Healthcare and public sector	10	59	79	72	59	38	34
Tourism, transport, and logistics	56	78	56	78	56	44	22
Total sample	67	63	53	52	52	31	22

[1]Q: *What metaverse features or capabilities have you implemented in your company to date?* (n = 258).
Source: McKinsey & Company Senior Executive Survey, April 2022

Example use cases

Companies spanning industries are experimenting in the metaverse for everything from marketing to education and commerce. Here are some leading examples:

- **Product marketing:** Coca-Cola launched digital assets to support several marketing campaigns, such as auctioning NFT collectibles for International Friendship Day.[82]
- **Customer engagement:** Gucci launched its Gucci Garden on *Roblox*, a set of brand-themed rooms that aligned with the launch of a similar physical space.[83]
- **Next-generation commerce:** AnamXR uses game-engine technology to create cloud-based, virtual e-commerce platforms for 3-D immersive shopping experiences.[84]
- **Brand loyalty:** Adidas' Bored Ape Yacht Club NFT release provided access to physical streetwear drops, driving loyalty and creating a community around its virtual goods.[85]
- **Customer service:** Helpshift is rolling out solutions for customer-support tools in the metaverse, including user feedback, virtual identity verification, and VR support.[86]
- **Education:** The University of California at San Diego's Rady School of Management uses a virtual campus for real-time lectures, breakout spaces, and outdoor areas.[87]
- **Recruiting:** The Havas Group launched a village within *The Sandbox* that hosts recruitment services for improved candidate and onboarding experiences.[88]
- **Digital twins**: BMW is experimenting with creating digital twins of entire factories, and designing products using Nvidia's Omniverse technology.[89]
- **Public services:** Seoul's plan is to become the first city to host a metaverse platform for public services by 2023.[90]
- **Virtual tourism:** Ariva Digital's Wonderland platform is working to allow users to travel to imagined or recreated destinations.[91]

- Activities where companies promote themselves further with more engaging branding, marketing, and user-experience activities. For example, financial institutions created branches in the metaverse, offering immersive brand engagement.
- New products and services that provide seamless discovery, purchase, and post-purchase journeys. For manufacturers, that could mean fully personalized products given an XR layer, such as vehicles and devices.

Of all the potential drivers of the economic impact of the metaverse, e-commerce is the largest. We estimate it may have a market impact of $2 trillion to $2.6 trillion by 2030 depending on whether a base or upside case for the metaverse's development is realized, a contribution which dwarfs sectors such as academic virtual learning (an estimated $180 billion to $270 billion impact by 2030), advertising (a $144 billion to $206 billion impact), and gaming (a $108 billion to $125 billion impact). As you can see in Exhibit 13 and the industry examples in the following pages, realizing the potential for the metaverse to engage consumers and open new sales opportunities is critical to its overall development.

Exhibit 13

The metaverse can create impact across the value chain for sectors.

	Example use cases	Project Innovating net-new business models and revenue sources	Produce Operations with higher productivity and collaboration, and lower costs	Promote Engaging branding, marketing, and user experiences	Provide New products and services with seamless discovery, purchase, and post-purchase journey
Apparel, fashion, and luxury	**Digital fashion & luxury goods** **Immersive brand engagement**	Monetize on existing intellectual property into new, immersive offerings (eg virtual assets or experiences)	Almost no production costs or supply chain issues for virtual assets Collaborative, XR-enabled product design and development	Immersive brand engagement and campaigns supported by experiences within virtual worlds (eg virtual events to connect with the community)	Branded virtual assets development with high profit margin Consumer products from static/offline to virtual/digital Next-level product personalization
Financial services	**New metaverse products and services (eg DeFi)** **Immersive brand engagement**	Trusted digital services including payments, digital IDs, and signatures Lombard lending with digital collateral, NFT financing, and other innovations	Further digitized payments and services infrastructure Decentralized financial (DeFi) structures driving efficiency	Contextual financial services, eg, for consumer lending or insurance Next-level digital customer acquisition Immersive, metaverse-enabled brand engagement	Revolutionized customer service reducing employee cost and improving customer experience (with virtual tools) Fully personalized financial offer enabled by metaverse data
Healthcare	**Metaverse-enabled telemedicine** **Collaborative R&D**	Significant shift of revenue streams to the next generation telemedicine	XR-enabled R&D Optimized hospital operations, now faster, safer, and more accurate Remote diagnostics and procedures	Fully immersive remote telemedicine e-healthcare services without physical distance barriers	Metaverse-data driven, fully personalized health consultations, with access to real-time data Metaverse-enabled robots treating patients solving for employee shortages
Manufacturing	**XR-enabled factory floor** **Collaborative R&D**	Offering XR-enabled manufacturing solutions - next level industrialization for customers Product personalization revenues	Software, robotics, platforms and apps to run and manage IoT manufacturing (eg, robot managed w/ digital twin) XR-enabled simulation for manufacturing and assembly, details up to "screw-level" XR-enabled, collaborative R&D with increased safety through remote work	Full client/user visibility into supply chain process Project real-time monitoring, collecting information and tracking data in MV that can later be analyzed	New manufacturing services leveraging interconnected robotics, IoT and tech via digital twins in the metaverse Fully personalized products given XR layer – eg vehicles and devices

Exhibit 13 (continued)

The metaverse can create impact across the value chain for sectors.

Retail	**XR[1]-enabled retail** **Metaverse-to-offline conversion**	New revenue from of branded virtual asset sales in the metaverse as an intermediary Using metaverse to drive physical product sales	Reduced need for physical stores and associated costs - driven by virtual-world only stores on metaverse platforms and XR-store enhancements	Enhanced in-store experience with tailored surroundings, eg ski shop on the slopes; XR-enabled try-on Customization of in-store experience	Direct-to-consumer shopping services regardless of physical distance
Technology	**Immersive digital media and experiences** **Hardware and interfaces**	New net revenue through share of virtual asset sales (eg commission basis) New ad-based revenue streams Profit from metaverse tech stack and content provision	Efficient digital network of data centers at multiple locations at the same time	Immersive content delivery experiences within the virtual space, leveraging the metaverse for the next level of digital media engagement	New, immersive media/content offering Devices enabling next-level immersive experience regardless of platform of technology (not only VR headsets) Metaverse-tailored software and tech stack

[1]XR: Extended reality - Virtual Reality (VR) and Augmented Reality (AR).
Source: Expert interviews, McKinsey analysis

Apparel, fashion, and luxury

Shoppers already spend much of their day using digital screens and intend to spend the majority of their daytime in the metaverse within the next five years.[92] Is this where they will look to buy and wear fashion?

The signs are promising. *Decentraland*'s Metaverse Fashion Week in March received far more industry attention than any digital fashion event before it, attracting a wide variety of brands and creatives including Dolce & Gabbana, Estée Lauder, and Etro, although some notable players in the metaverse such as Gucci and Ralph Lauren did not participate. The experience was blockchain-based, created on "land" and sold as NFTs, with digital fashion bought and worn as NFTs.[93]

It also underscored the extent to which the sector has evolved. In 2000, some believed e-commerce could never be a luxury experience, yet today there is a deeper understanding that digital can lead to enhanced client experiences. If luxury is about being part of a community, the metaverse has the potential to enhance that. "There is probably an underestimation of the value being attached to individuals who want to express themselves in a virtual world with a virtual product, [through] a virtual persona," Gucci's executive vice president and chief marketing officer Robert Triefus said in our recent *State of Fashion 2022* report. "The idea that everything has to be physical is very quickly being disproven."[94]

Because of the fashion industry's ability to be both virtual and physical, we believe it will be at the forefront of the metaverse shift. Many brands are already embracing the opportunity to launch virtual clothing to tap into their consumers' increasing appetite for creating digital identities. Consumers see the unique value of fashion within these digital worlds, where creativity, status, exclusivity, and—most

importantly—self-expression play essential roles for all users. In fact, around 70 percent of US consumers already say their digital identity is as important as their real-life identity,[95] which is why fashion is the one of the industries perhaps most uniquely positioned to shape the metaverse. It makes business sense too: the gaming skins market reached about $40 billion in 2020,[96] and platform reinventions could make the metaverse the biggest growth opportunity for fashion since e-commerce.

"Consumer behavior has largely shifted toward adopting digital personas, yet many brands have yet to provide a solution," AnamXR cofounder and CEO Irene-Marie Seelig told us. "This opens up a whole new revenue model for brands who can supply digital assets like clothing, for example."

How companies currently use the metaverse

The fashion industry's early experiments with virtual worlds have largely been via launches of virtual clothing (in games such as *Roblox*, for instance, it's normal for players to update their avatars daily). Several apparel companies have flexed their creative muscle: for example, Balenciaga dropped a line of virtual gear and apparel in *Fortnite* together with a physical collection, resulting in a more than 40 percent increase in searches for its brand two days after launch.[97] And fellow luxury-goods retailer Gucci sold a virtual version of its Dionysus bag for the equivalent of $6 on *Roblox*, which later led to bids of more than $4,000 per bag when resold on the second-hand market, which is higher than the price of the physical bag.[98]

Much of the frenzy about fashion metaverse launches has centered around NFTs—for instance, Adidas' NFT collaboration with Bored Ape Yacht Club resulted in sales of more than $100 million.[99] We believe the longer-term opportunity for fashion brands is engaging consumers with NFTs for more pragmatic purposes, such as loyalty tokens or digital twins. NFTs from Gucci, Adidas, and The Hundreds, among others, trigger loyalty benefits like early access to new NFT drops and physical products, essentially serving as a membership program. NFT digital twins can host information about a physical or digital product's history, authenticity, and ownership—especially beneficial to luxury retailers battling counterfeiting.

'Consumer behavior has largely shifted toward adopting digital personas, yet many brands have yet to provide a solution. This opens up a whole new revenue model for brands who can supply digital assets like clothing, for example.'

—Irene-Marie Seelig, cofounder and CEO of AnamXR

Embracing the virtual world

Virtual experiences in various formats have also been popular. For example, Gucci launched the Gucci Garden—a two-week art installation on *Roblox* that attracted 20 million visitors.[100] Louboutin partnered with the Korean gaming app *Zepeto* to launch a virtual "Loubi World," where VIPs and press were able to see its spring-summer 2021 collection while discovering Paris landmarks—and interact with a digital twin of Christian Louboutin.[101] Marni's Wear We Are metaverse experience, powered by AnamXR, was an immersive digital journey with interacting 3-D scanned models from Marni's spring-summer 2022 fashion show.[102]

"For luxury brands, the metaverse provides a gateway to offer unique experiences for holders," AnamXR's Irene-Marie Seelig said. "We are transforming our luxury metaverse platform to be a more evergreen, always available experience for brands that are starting to venture beyond one-off campaigns, and we have recently also introduced 'token-gating' for brands seeking to extend the sense of exclusivity to the metaverse."

Gamified experiences have also proven a powerful channel. Vans' "Vans World" on *Roblox*—where users can skateboard and dress their avatars in Vans Apparel—tallied around 60 million visitors in the year since it was launched in April 2021.[103] Similarly, Nike launched NIKELAND on *Roblox*, attracting more than ten million visitors from December 2021 through April 2022.[104] Some companies have even developed video games outside existing virtual worlds, such as Louis Vuitton releasing a game last year where players could acquire NFT art while experiencing the life journey of the brand's founder.[105]

What could come next

The creation of their own platforms and virtual worlds—which risks further fragmentation and issues with interoperability—could be the next step for fashion and luxury brands in the metaverse. So far, companies have been treading lightly, choosing less resource-intensive ways to enter the space. One exception is virtual-only incumbents such as Fabricant, which has already partnered with various apparel companies including Adidas, Under Armour, and Tommy Hilfiger.[106] DressX, another virtual fashion start-up, features more than 100 designers and 1,000 created items, and has partnered with well-known fashion brands including H&M.[107]

As mentioned, luxury brands are developing immersive virtual spaces—as Australian designer Daniel Avakian has. Customers can visit no matter where they are and have a boutique experience in a virtual representation of his New York store, while staff can also work across both metaverse and physical locations—when one is quiet, they can tend to the other.[108] It is an early example of the kind of new experience that can be developed.

There are significant challenges, however. While pioneers have shown the metaverse provides opportunities that echo or even improve those in the real world, their potential remains unclear—and most companies are proceeding carefully. There is also concern about brand dilution, especially within luxury, as companies contemplate association with digital items and how that may derail their image from core, luxury brand positions. An additional consideration is the maturity of AR/VR technology, in which glitchy applications can undermine the user experience of luxury goods, presenting an image and consumer engagement threat. Brands should consider what is necessary to strike the right balance between testing and learning, and ensure they are rigorous in thinking through potential outcomes of actions taken in this new, exciting, and seemingly limitless space.

There is also the issue of what a metaverse venture means organizationally. Generating sustainable revenue from virtual worlds will require entirely new capabilities and an almost diametrical talent shift in the creative design process as well as digital execution. Brands may need to review existing

organizational structures and skills, update their recruiting strategies, likely establish innovative partnerships with metaverse platforms, and acquire start-ups in the space.

Yet the level of connectivity in the metaverse for certain users already shows how the virtual world could have a significant influence on consumer habits and trends in the physical world, not to mention how this may inform which physical designs are ultimately produced and sold.[109]

Consumer packaged goods

Consumer packaged goods (CPG) companies may face challenges in the metaverse as their products are traditionally connected with practicality and usability in the physical world. In virtual spaces, day-to-day consumer activities such as eating, drinking, or cleaning will be replaced by immersive experiences. Yet consumers seem excited to see CPG brands entering virtual worlds, which indicates there's an opportunity for companies to actively shape their destinies.

How companies currently use the metaverse

Metaverse offerings may present high-margin revenue streams for CPG companies, which typically operate under significant margin pressure. While it would likely remain far smaller than core revenue streams and be more focused on marketing and consumer engagement in the near-term, we see opportunities for CPG brands across two of the metaverse's layers: content and experiences, and platforms.

Digital assets and virtual experiences have so far been the most popular play. For example, Hasbro's popular toymaker Nerf launched Nerf Hub in *Roblox*, selling virtual in-game items,[110] and Coca-Cola launched a digital jacket to be worn in the 3-D virtual world *Decentraland*.[111] Companies have also launched NFTs, using them as an innovative way to foster customer loyalty by extending unique privileges to NFT holders.

With regard to virtual experiences, CPG brands are increasingly active. For example, P&G Beauty entered the metaverse with a virtual storytelling world called BeautySphere[112] and, in February this year, L'Oréal filed 17 patents related to NFTs and the metaverse—a testament to its ambitions. More CPG brands are likely to follow if consumers shift more experiences to the metaverse, especially considering companies' known engagement with events and sport sponsorships. As virtual worlds evolve and customer attention increases, parts of capital devoted to sponsorships are likely to flow into virtual worlds, fueling virtual experiences.

What could come next

Just as Web 2.0 and social media were successors to offline marketing, these early virtual initiatives are to some extent simply a new generation of promotional tools. CPG brands should consider how they can use their brand power to venture into new business-building opportunities in the metaverse. And it will be especially important if, as many believe, the digital world becomes even more dominant in our lives.

It is not necessarily simple. As it has been noted, the metaverse vision is especially challenging for CPG brands whose business models are deeply rooted in physical consumption. So far, they are exploring digital assets and virtual experiences as promotional vehicles. There may come a point where they either continue to focus on branding and promotion that drives metaverse-to-offline conversion, or explore the opportunity to build virtual offerings creating long-term value independent of physical products.

In the short term, it seems likely big-name brands will enter the metaverse first to secure their position, with others following as the commercial use case is proved over time. In deciding when to enter, CPG companies should carefully weigh potential first-mover advantages (including short-term promotion and

learning early lessons) against the inherent uncertainty this new opportunity entails. And in deciding how to enter, CPG leaders should consider the organizational capabilities required to make their metaverse plans a reality, especially if these extend to undertakings such as developing experiences, games, or worlds. The preferred strategy may be to collaborate with established tech providers, as LEGO did with Epic Games to shape a metaverse space for young players.[113]

One big question surrounds the resources CPG companies should direct to the metaverse. Many hold immense advertising budgets: P&G's global marketing spending was around $8 billion in 2021, for example, while Unilever spent about $7 billion.[114] Leaders will need to balance maximizing additional customer engagement from the metaverse while maintaining a healthy ROI, especially when deciding whether to explore high-investment, less proven options such developing their own gamified experiences or virtual worlds.

For brands and retailers in the medium to longer term, the metaverse will be about adding a new sales channel to the omnichannel mix. This is also critical to unlocking the metaverse's ultimate potential. It will succeed in the consumer sector if it further blurs the line between the concepts of "online" and "offline" to create a unified experience. And it may not only create rich, intense, and seamless customer experiences that can span the physical and digital worlds, but also collect valuable new data points for understanding customers in a cookie-less world.

Financial services

The metaverse brings together online social networks, gaming, cryptocurrencies, and increasingly diverse digital assets to enable novel services and experiences. Financial services companies have joined peers across industries in exploring the potential opportunity in the metaverse, though few are yet attempting this at scale. The likely future extent of the impact of the metaverse on the sector depends on the evolution of the underlying technology (especially utilizing Web3) and on the degree to which platforms are adopted as part of our daily interactions.

How companies currently use the metaverse

There is already a clear distinction between how financial institutions have been engaging with the more traditional Web 2.0 metaverse and experimentation in Web3-enabled metaverse venues. In the context of Web 2.0, we see financial services companies utilizing the technology for employee training (for example, Bank of America VR training[115]); creating virtual "financial towns," telecommuting centers, and interaction spaces (such as South Korea's KB Kookmin Bank[116]); and offering virtual investment advisory services (for instance, NH Investment & Securities[117]). While these applications are quite mature, their impact on the fundamental business model in financial services has been only modest.

In the Web3-enabled metaverse, we are starting to see more creative models of engagement. For example, HSBC has purchased virtual land in *The Sandbox* dedicated to engaging with e-sports enthusiasts.[118] As London-based fintech Sokin is building infrastructure for processing metaverse payments, transactions, and investments,[119] neobank Zelf is launching embedded banking for metaverse gamers via its MetaPass in Discord.[120] Several companies including North American technology company TerraZero are providing back-end support for virtual real estate financing in the metaverse.[121]

There is no shortage of financial services companies exploring the utility of the latest evolution of the metaverse. As its function transitions from primarily consumer entertainment to more commercial applications—and from niche social interactions to become a social network—the opportunities for the sector will only expand, including the following examples:

— **Marketing:** Institutions may create digital branches in the metaverse to build their brand and credibility with users, demonstrate their ability to innovate, and even offer client interactions in a hybrid way with more traditional digital or even physical channels.

— **Infrastructure:** Financial institutions, especially more traditional ones, are uniquely positioned to bridge the trust gap that has traditionally held back wider adoption of services such as digital IDs, digital payments, or custody for NFTs, cryptocurrencies, or other digital assets.

— **Emerging products and services:** As cyber insurance for companies and similar services become more commonplace, insurers and cybersecurity companies are well positioned to capture parts of this emerging value pool, maybe even in novel collaboration and models.

What could come next

As the metaverse potentially captures a larger share of day-to-day human interactions, digital versions of more sophisticated banking services could emerge to serve these users. Examples could include:

— embedded bank-like services for wallet owners in native metaverse venues, such as multicurrency cash management

— back-end servicing for financial services, like virtual real-estate mortgage origination and warehousing

— funds and investing services for metaverse projects, such as metaverse-specific investment funds

— customer engagement enhancements, like gamified credit education and unique loyalty experiences

— financialization of everything, as more digital assets get created with utility in a metaverse context, such as being employed as collateral for loans

Growth in these use cases will depend on the extent to which the metaverse is adopted. And the value and convenience of financial services in the metaverse must exceed the current utility of online or bricks-and-mortar servicing. If engagement in the metaverse gains momentum, more and more financial service companies will need to decide between investing and entering at scale, establishing a minimal position, or doing nothing for now. It's a decision that depends on four factors: the willingness to bet on the future value of the metaverse; the talent, capacity, and capability to develop a relevant position; the scale of potential metaverse customers and relevance for the existing and future customer base; and the extent to which the metaverse vision fits with the strategy and culture of a company and its employees.

Not entering the metaverse is also a strategic choice. But while widespread metaverse adoption and the development of significant revenue pools in financial services may take time, many companies may decide an early investment is an appealing strategic hedge, especially with the increasing integration with digitally native assets.

Retail

Traditional retailers have in recent decades felt the squeeze of technological change, especially in the past two years as physical retail has been forced to evolve into an omnichannel environment. Strong competitive advantage is likely to now flow to retailers who understand how to use the metaverse to enhance their stores and engage customers, build experiences, and foster their brand community. That may require shopping concepts very different to those used traditionally, especially those used in bricks-and-mortar stores.

How companies currently use the metaverse

The idea of virtual and digitally enhanced retail is not new. With experiments such as Farfetch's Store of the Future in 2017,[122] among many others, the concept of merging the worlds of physical and digital for stores is established. After all, 25 percent of consumers have shopped in a virtual store today—and about 70 percent of them made a purchase.[123] Now the emergence of the metaverse has made the opportunity clearer than ever.

A range of metaverse-powered approaches and applications can be deployed in-store. Brands can leverage VR/AR to offer a new level of experience: 3-D, navigable, and branded spaces allowing customers to experience and buy virtual or physical goods, while also leveraging the technology to enable customers to try out products not available in store. There is also another advantage: in addition to more sales, there may also be fewer returns as consumers have a clearer sense of products being purchased. Appliance company Dyson, for example, launched a digital store accessible through a VR headset, allowing customers to "walk" through and test its products virtually.[124] Meanwhile, multiple US furniture retailers such as Crate & Barrel, Walmart, West Elm, and Wayfair have partnered with Pinterest to use AR to enable consumers to see how furniture will look in their living rooms.

The development of online, virtual worlds also allows retailers to expand their footprint. Instead of having stores in every city, a brand can build one in the metaverse for customers globally. Some are already exploring this path. Samsung launched a virtual store in *Decentraland* at the beginning of this year, modeled on its physical Samsung 837 store in New York City, enabling customers to complete different quests to earn NFT badges.[125] Retailers including Ralph Lauren, Urban Outfitters, and Walmart have filed trademarks related to opening virtual world stores,[126] while a parcel of land within *Decentraland* was sold for almost $1 million for the establishment of an online shopping mall.[127]

Finally, like apparel, fashion, and luxury-goods companies, retailers can use the metaverse for advertising, brand activation, and recruiting purposes. For example, Chipotle established a virtual restaurant in *Roblox* for a Halloween campaign, giving a voucher for a real-life burrito to any visitor wearing a costume. And Carrefour even launched a metaverse-based recruitment effort as it pursues its goal of hiring 3,000 data experts by 2026 to drive its digital transformation.[128]

What could come next

The metaverse presents an opportunity for retailers to reimagine and personalize the store environment for individuals and groups of customers. For example, using VR technology, customers at a sporting-goods retailer could shop in settings matching the specific sport they are buying equipment for, such as shopping for ski equipment in a virtual version of the Alps and even trying skis in virtual reality.[129] Metaverse malls are also being created, featuring storefronts where users can interact through their avatars. Boson Protocol, for example, has a mall in *Decentraland* allowing users to explore digital items and buy an NFT voucher that can be redeemed for the item in the real world.[130]

The success of the metaverse in retail depends on the creation of a virtual world in which to engage, such as stores and shopping malls. Consumers increasingly see their digital shopping experience becoming a rich ecosystem across multiple online channels, and the metaverse may be a natural expansion of that. The key is not just bridging the gap between the physical and digital, but creating a consistent customer experience. Already, we see research showing that such multichannel formats and marketplaces will drive the vast majority of sales growth in Europe and the United States during the next five years.[131] In this context, personalized promotions and privileges may be powerful marketing strategies for retailers in the metaverse, with the potential for deeper relationships with customers.

Despite the substantial promise of the metaverse, the emergence of a new channel means retail executives also have significant challenges and questions they will have to tackle. They will need to consider how the metaverse could impact physical stores, for example, by further shifting consumers' preferred shopping channels. Retailers will need to seek the right balance between their existing physical retail network and virtual-world offerings, aiming to develop a seamless connection between the two to drive real-world sales. For example, Forever 21 recently opened a store on *Roblox* and capitalized on a popular trend among metaverse users: the idea of "twinning" with your avatar, buying the same clothes and accessories for your real-world self. The result? A best-selling virtual-only item on *Roblox*, a black beanie hat, made its way to the company's physical stores.[132]

Yet retailers need to carefully monitor how the metaverse develops. While its promise is incredibly exciting, reality currently trails imagination. Retailers could bet on realizable use cases and customer-friendly experiences, while continuing to scale their investment in in-store technology. Finally, while the metaverse can be a boon to retailers, they need to ensure the maturity of the technology does not pose risks to their brand. Already, pioneers experimenting with virtual stores have encountered technical difficulties: for example, many customers were unable to access a high-tech company's virtual store during a launch event.

Technology

The metaverse presents a massive opportunity for technology companies, both existing and yet to be born. The metaverse technology stack consists of four core components made up of ten layers (as described in Exhibit 1 on page 16), and reaching its full potential will require a broad range of technology innovations. There are three areas in particular that are emerging as control points likely to capture the lion's share of value created:

— **Infrastructure:** Metaverse environments need to deliver real-time 3-D experiences at scale to millions (or even billions) of individuals. Latency is generally seen as the hard problem in delivering these immersive and interactive experiences. Additionally, these experiences will require computational efficiency to improve by two to three orders of magnitude, along with innovation across devices, edge computing, and cloud capabilities.

— **Developer tools and platforms:** Building 3-D experiences requires a very different set of developer tools and platforms than the current developer stack on web and mobile. This ranges from design tools (such as 3-D modeling, animation, and audio) to core engines and rendering to back-end services (for example, LiveOps, multiplayer services). AI will also play a critical role in the metaverse, from tracking and predicting motion to real-time rendering of worlds, content creation, and optimizing operations.

— **Virtual worlds and content:** Today, there are more than 100 virtual worlds, most of which are focused on gaming or social experiences and with wide variation in graphics fidelity, immersivity, and centralization. While a few major platforms will emerge, we expect continued fragmentation, with higher levels of interoperability. We also expect platforms attracting creators and optimizing creator economics will have a significant competitive advantage. On the content side, there will be at least three archetypes that will populate the metaverse: first-party content, developer content, and user-generated or creator content. Brands are also likely to become creators and participate in the metaverse in a very different way from traditional advertising models.

‘We don’t want to escape reality but rather embrace and augment it with virtual content and experiences that can make things more fulfilling and make us feel more connected to our loved ones, more productive at work, and happier people.’

—Cathy Hackl, chief metaverse officer and cofounder of Journey

Four technology enablers

Four key technology enablers will also be required for the metaverse to reach its full potential. The first is devices across AR/VR, sensors, haptics, and peripherals. Devices are critical to driving adoption of the metaverse and we are already seeing an accelerating pace of innovation. There are around ten major AR/VR devices in the market today—ranging in price from about $300 to $3000—and up to ten more major device launches are expected in the next year or two. Yet significantly more progress is needed across display quality, usability factors such as weight and battery life, and computing power. While many of these capabilities can be delivered in isolation today, balancing all of them in the right form factor is a problem that will likely require years of innovation.

The second technology enabler is interoperability and open standards. Interoperability is a nuanced problem with user-facing components like identity and ownership as well as elements facing developers and creators such as cross-platform development, file formats, the consistent behavior and physics of objects in 3-D environments, distribution, and monetization. Web3 infrastructure potentially unlocks some of these, as do emerging standards like USD, glTF, and OpenGPU. However, as with devices, we are in early days and likely a few years from overcoming interoperability hurdles.

The final two major enablers are platforms to facilitate the metaverse economy as well as tools for building a safe and secure metaverse. For the economy we will need a new set of access and discovery tools, as well as platforms that facilitate payments and monetization, including advertising. Security, identity, and privacy concerns in the metaverse are greatly magnified given the increase in the level and complexity of data collected, as well as increased risks around impersonation, harassment, and the potentially increased need for content moderation in 3-D environments.

Potential broader implications

The best intentions can have unintended consequences. Stakeholders need to be mindful of the broader implications of their actions and, at a minimum, learn from past generations of online community and platform builders to define a roadmap toward an ethical, safe, and inclusive metaverse experience. The intent should not be to build another social web, but a societal-scale construct that puts people first.

“Much of what we’ve read about the metaverse from sci-fi has been pretty dystopic, but I do think we need to envision what it will look like so we can build toward a more positive view of the future,” Cathy Hackl, chief metaverse officer and cofounder of Journey, told McKinsey’s *At the Edge* podcast. “We don’t want to escape reality but rather embrace and augment it with virtual content and experiences that can make things more fulfilling and make us feel more connected to our loved ones, more productive at work, and happier people.”

Maximizing the human experience

One filter through which all decisions around a company's involvement in the metaverse should pass is to ask: how will this augment and elevate the human experience? "The conversation needs to be about the kind of platforms we want to create, and what we can learn from the past 15 years of mobile platforms," the VP of Epic Games' Unreal Engine Ecosystem, Marc Petit, said. "If we want a creator economy—if we want our kids to have jobs that we could not even dream of ourselves—how do we think about those platforms as citizens, companies, and regulators? Because they are going to be hugely important for the future, and we've already learned a lot from the social-media era that we need to factor in."

As the opportunities and challenges of the metaverse continue to evolve, we anticipate an evolving set of design principles to help guide the creation of experiences that consider the needs of people from the start. Designers often define a set of principles to establish an agreed-upon approach and boundaries within which to ideate. We believe five design principles should guide initial iterations of the metaverse:

1. **Build a people-first experience,** always considering the needs of people and how outcomes can potentially impact them.

2. **Shift from social to societal,** moving away from tools that simply allow communication to those emphasizing relationships between people, places, and brands.

3. **Design responsibly,** creating stellar experiences for people that ensure they're not disconnected from reality.

4. **Make accessibility and inclusivity a feature,** enabling all people everywhere to participate and fully express themselves.

5. **Reduce the physical and mental friction** by adapting decades of 2-D and 3-D user-experience design to ensure we engage with each other in a more human way across worlds.

Focusing on the human experience within the metaverse is a must, not an option. To reap the full benefits and opportunities of the metaverse, brands, companies, and agencies have a responsibility to design positive experiences for consumers, end-users, and citizens. "One of the biggest hurdles that the metaverse is going to need to overcome to move forward is helping people see what they couldn't see before, know what they didn't know before, and feel what they couldn't feel or didn't know to feel the day before," Salesforce's global innovation evangelist Brian Solis said. "What the metaverse is really all about is community. The value of belonging to this community. The role you can play as a user in this community so that you feel like a stakeholder and not as a 'user.' These are some of the human-based hurdles that I'm not hearing discussed enough."

Broader implications

There are clearly significant societal implications stemming from the development of the metaverse. It will connect people not only to each other but to everything from brands, places, cities, governments, and services in new, meaningful, and profound ways. Thinking of the metaverse through a societal lens imbues the user experience with a sense of belonging *and* responsibility to one another. This mindset is crucial to building worlds within the metaverse that are human and strengthen bonds to each other, to real places of belonging, to agencies, and brands. "From a cybersecurity perspective, it's not just about servers, nodes, or networks anymore," XR Safety Initiative's Pearlman told us. "The attack surface has expanded to our human brain and our living spaces because we can now extend screens and activities into our real-world surroundings."

‘This is the right time to be thinking, okay, in real life, you have playgrounds and schools. And very clearly, they’re fun, playful spaces. But, equally, in the same way that you wouldn’t have a child walking alone after midnight in the middle of Soho, you wouldn’t want the same thing to happen in the metaverse.’

–Rob Lowe, managing director of Digital Play at LEGO Ventures

Relying on the goodwill of those participating in the metaverse may not be enough: social media, for example, has become one of the most influential forces of our time, for good and ill. “The internet was an extremely decentralized concept from the beginning by design,” Niantic’s Hanke said. “But it evolved in a certain direction, and it’s evolved so far in that direction that people are recognizing the limitation of that. My feeling is it is swinging back towards a more open model, where people will attain more sovereignty and control over their data and information.”

Areas we believe may require guidelines include:

— Data privacy, notably to ensure individuals retain control over their personal data. The metaverse promises new types of personal data (such as eye tracking, sensor data, and room mapping) tied to an identity which, with underdeveloped security capabilities, may endanger personal identity and privacy.

— Security, not only in relation to cybersecurity but also to payments.

— Ethics and regulatory compliance to ensure the metaverse is a safe environment, such as by moderating content and addressing the use of online anonymity to commit crimes.

— Physical health, such as measures to mitigate the risks of addiction, protect physical and mental wellbeing, and promote outdoor activity (even potential issues such as vertigo need to be considered in a VR environment).

— Sustainability, as the metaverse's computing infrastructure is resource intensive; this applies to multiple elements, from state-of-the-art VR—which may create about 2,000 pounds of carbon emissions over five years—to the massive amount of computing power (and energy) required to process blockchain transactions; as the United Nations Environment Programme notes, policymakers may "need to adjust regulations to spur the development of future energy systems while mitigating environmental risks."[133]

— Equity and fairness, seeking to eliminate bias in metaverse-driven decisions and promote diversity and inclusion; today, fewer than a third of creators of interactive experiences are women, which affects the types of experiences being created; also, women are also three times more likely to experience VR nausea.

The metaverse may bring extensive societal change. People could be working in a virtual world, playing games together, owning virtual assets, consuming virtual land and goods, socializing in virtual spaces, and creating worlds and items. We are not suggesting holding back from experimenting in the metaverse until the road map seems clear—that could place organizations at a competitive disadvantage that might be hard to recover from. Rather, organizations should take care to develop products responsibly, taking the opportunity to embed and engender digital trust while the metaverse is still in its formative stage. We are already seeing allegations of disturbing behavior within metaverse worlds,[134] underscoring the need to address emerging issues before they potentially become systemic problems.

"This is the right time to be thinking, okay, in real life, you have playgrounds and schools. And very clearly, they're fun, playful spaces," LEGO Ventures' Rob Lowe said. "But, equally, in the same way that you wouldn't have a child walking alone after midnight in the middle of Soho, you wouldn't want the same thing to happen in the metaverse. So, how can we build that in a way that allows kids to have these creative, social experiences that they deserve and want to have, but build it in a way from the ground up so we're not trying to layer over it and fix it in the future?"

5

Moving at speed: How do you capture value, and what can you do today?

Those who spend time researching the nascent metaverse will understand its appeal. The question for leaders then becomes two-fold: what role do you want your company to play, and how should you prepare? Companies have various ways they can participate in and capitalize on the metaverse, ranging from what we call "world builders" (building and orchestrating a proprietary digital world and platform) to providing products and services to metaverse users or building hardware and software. Yet defining your metaverse ambition is the just first step toward developing a strategic stance.

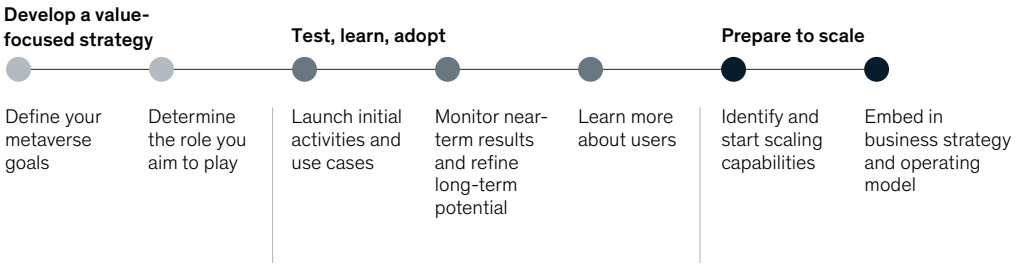
Developing a business strategy for capturing value

It is always an option to simply not participate in the metaverse. In our view, that may result in a significant competitive disadvantage: customers are moving toward the metaverse and, while the degree of any company's involvement may vary, it is important to consider how it may impact your business both positively and negatively and formulate a strategy.

Consider a step-by-step approach (Exhibit 14) to prepare your business:

Exhibit 14

Steps to prepare your business for the metaverse.



— **Develop a value-focused strategic stance** in two steps:

1. *Define your metaverse goals*, such as whether you want to generate demand across existing and new segments, build communities, and create new revenue streams.

2. *Determine the role you want to play*, from building experiences to facilitating interactions and enabling infrastructure.

— **Test, learn, and adopt** in three steps:

1. *Launch initial activities and use cases*, exploring opportunities such as NFTs, immersive experiences, native advertising, and having a metaverse presence.

2. *Monitor near-term results to refine long-term potential* by identifying the right metrics for initial activations and testing long-term monetization options.

3. *Learn more about users*, examining behavior on different platforms and undertaking primary research.

— **Prepare to scale** in two steps:

1. *Identify and start scaling capabilities* through sourcing the talent required and establishing the necessary technology infrastructure and tooling.

2. *Embed the metaverse in your business strategy and operating model*, while clearly identifying who will drive the initiatives in your organization.

Actions for executives to consider

The metaverse is likely to impact not only how businesses interact with customers, but how companies operate. Human resources will have new ways to undertake learning and development and recruiting. Strategy teams will be able to examine new revenue streams and business models. Marketing is already tapping the metaverse's potential. Sales teams will be able to host and attend events and conduct consultations and negotiations. Customer support may use the metaverse for service calls or to directly demonstrate actions. Research and development will be accelerated through the use of digital twins and new design tools. Even the operations function could leverage the metaverse for general and administrative tasks.

There is no avoiding the fact that if you want to both understand consumers and opportunities that may be available to your organization, you need to be familiar with the metaverse. Make an effort to explore *Roblox*, *Fortnite*, *Minecraft*, or a similar gaming experience. Explore *The Sandbox* or *Decentraland*—and connect a MetaMask wallet.[135] Join a Discord server or spend time on a Twitch channel. Check out the NFT marketplace. Strap on a VR headset and try a new experience. Have a virtual meeting or event on a platform such as *Gather Town*. You will be better armed for making informed decisions.

"What I've seen over the past year is that a lot of companies and brands have begun to dip their toes in the metaverse, maybe it was a marketing effort, but now they're taking a step back and asking, 'What does it really mean?'" said Cathy Hackl, chief metaverse officer and cofounder of Journey. "They're really wondering what this means for their company, for their brand DNA, for everything that they stand for. Some of those early assumptions and pilots might fail, but the brands might still get a pass. But if you wait a year and a half or two years to do something, to have a clear strategy, and to start testing these assumptions, it might be a little bit too late."

Actions for policymakers to consider

The challenges of regulating technology today will also exist in the metaverse—and some may be amplified. The role of technology in all aspects of our lives—especially during COVID-19—has led to renewed discussion around how regulation needs to evolve. As Charlie Bell, Microsoft's executive vice president of security, compliance, identity, and management, pointed out in a recent blog post: "The problems of yesterday's and today's internet—impersonation, attempts to steal credentials, social engineering, nation-state espionage, inevitable vulnerabilities—will be with us in the metaverse."[136]

There is already debate on a number of critical topics, including open access to the metaverse; competition and promoting innovation; intellectual property rights; commerce, monetization and distribution models between stakeholders; promoting diversity, equity, and inclusion; securing user safety and awareness; and ensuring data privacy. Policymakers will benefit from planning ahead and defining the legal, policy, and governance of the metaverse and its broad implications in these discussions. This includes addressing these issues, building the capacity to evolve policymaking while keeping up with metaverse developments, and executing the policies in the market. For example, local government bodies may define policies in line with local regulations, while collaborating with global government bodies on standards and policies and engaging leading corporations and private groups to proactively guide metaverse development.

Public-sector entities also have an opportunity to reimagine public services and infrastructure in the metaverse. For example, the metaverse opens new avenues to providing government-related and other public services like education and healthcare, creating employment, and planning community spaces. One key challenge will be enhancing the talent base in the public sector so it can shape priorities and a road map for the greatest social good, and execute against them in partnership with technology providers.

Early examples are already emerging of city governments outlining their metaverse strategies and bringing their first initiatives live. As mentioned earlier, Dubai aims to increase the contribution of the metaverse sector to its economy to $4 billion by 2030,[137] and its Virtual Assets Regulatory Authority announced plans to establish Metaverse HQ in *The Sandbox* platform.[138] And the government of the city of Seoul plans to spend at least $32 million on a metaverse ecosystem to improve city services as well as planning, administration, and support for virtual tourism.[139] "We want to create a free space for participants to flexibly come together and communicate with one another," the CIO of Seoul's Smart City Policy Bureau, Jong-Soo Park, said. "We then wish to provide custom administrative services without restrictions of time and space."

National and local governments will need to define for themselves the right time to act. On one hand, policymakers may find it difficult to develop detailed regulatory frameworks for governing the metaverse while it remains so fluid. But, on the other, governments can already plan ahead and build the structures and capacity to be able to stay abreast of changes and respond quickly when needed. This will also allow them to engage with private-sector stakeholders, and proactively guide the development of the metaverse—even outside of concrete regulation.

Conclusion

What will the metaverse be? And what will it do? Consumers and businesses are already beginning to explore ways it can deepen connectivity and complement everyday activities. And, within a decade, the metaverse has the potential to drive a very different world.

By 2030, it is entirely plausible that more than 50 percent of live events could be held in the metaverse. More than 80 percent of commerce could be impacted by something consumers do there, from discovering brands to visiting a virtual store. Most learning and development could happen in a metaverse environment, as could most virtual or hybrid collaboration. Asset-heavy enterprises such as manufacturers and telecommunications companies may have virtually all assets and processes represented in a digital mirror, and the same applies to the simulation of physical products and spaces to aid their design. We expect the average internet user to spend up to six hours a day in metaverse experiences by 2030.

Such generational changes rarely happen overnight. They tend to take years and are the result of an accumulation of incremental advances, driven by an ethos of experimentation on platforms that allow creativity to flourish. And because they ultimately result in fundamental changes to our lives, they may also present risks for individuals and society. In describing an earlier era of technological disruption, then-Senator John F. Kennedy in 1960 described automation as "a revolution bright with the hope of a new prosperity for labor and a new abundance for America—but it is also a revolution which carries the dark menace of industrial dislocation, increasing unemployment, and deepening poverty."[140]

Stakeholders have an opportunity to shape the metaverse in a way that fosters greater social cohesion, reduces inequality, widens access to education, and acts as a catalyst for social mobility. The metaverse should not be a substitute for the real world or the in-person connections that bind us. It should complement what people do and, like virtual and in-person offices, allow free movement between the virtual and physical worlds in a way that expands our range of experiences rather than limiting them. But ensuring that happens requires collective leadership to ensure the actions taken responsibly shape the evolution of this revolution.

In the end, with its potential to generate up to $5 trillion in value by 2030, the metaverse is simply too big to be ignored. It will have a major impact on our commercial and personal lives, which is why businesses, policymakers, consumers, and citizens are well advised to explore and understand as much as they can about this phenomenon, the technology that will underpin it, and the ramifications it will have for both our economies and wider society.

Appendix A: Estimate of investment in metaverse technology

Investment flows into metaverse technology were divided into two major categories: external investments by funds and corporations, and internal corporate investments.

The external investment category captures annual investment in metaverse-technology-related companies by venture capital (VC) and private equity (PE) funds, as well as merger and acquisition (M&A) activity by corporations. The values provided are estimates of the annual investment in the metaverse, based on data available in the Capital IQ, Crunchbase, and PitchBook databases. These data were then triangulated with press research on leading acquisitions, and further pressure tested with internal and external experts across both metaverse technologies and industry. The estimate assumes all registered deals were completed within the year of transaction. For VC and M&A deals, only metaverse companies whose core technology is metaverse-related were included. This notably includes Microsoft's planned $69 billion acquisition of Activision Blizzard. For PE investment, target companies needed to be strongly related to metaverse or virtual technology. Deals announced but not completed by the end of 2021 were excluded.

The internal investment category includes expenditure on all corporate activities both for developing metaverse-based products, services, or experiences and for building and leveraging a company's metaverse capabilities. It excludes M&A. The estimate of internal corporate investment is based on a metaverse budget average for 30 major companies making strong plays in the space. The top 30 metaverse adopters with publicly announced investments were consolidated. This notably includes the $10 billion annual corporate investment announced by Meta. Companies that disclosed information on internal metaverse expenditure were then used to estimate a cross-sector average for metaverse adopters. For those enterprises that are known metaverse adopters but have not yet publicly shared an exact investment amount, corporate investments were extrapolated using the average among players who are metaverse technology adopters.

Appendix B: Impact model and investment

To forecast the potential value that may be created by metaverse technology by 2030, a bottom-up assessment of the most relevant consumer and enterprise use cases was conducted across a set of industries and sectors. The focus was on thinking through top use cases and the potential for value creation. Given the uncertainty, these are inherently hard to predict. However, we believe this gives a directional view of the potential and value at stake from metaverse technologies.

In that calculation, the potential value of the metaverse results from expected market sizes and key assumptions about industry-specific metaverse market penetration in 2030, informed by primary research and subject-matter experts. The primary research conducted in May 2022 covered three categories:

1. A global metaverse consumer survey (n = 3104) from countries across North America, Europe, and Asia
2. A survey of C-level executives from 448 companies spanning geographies and company sizes
3. Internal and external industry and technology expert interviews

For each future scenario of consumer and enterprise use cases, the impact analysis draws a conservative base case and an optimistic upside potential. This credits the inherent uncertainty about the metaverse across dimensions such as consumer adoption, technology, and regulations. The estimate of potential total value will almost certainly be incorrect in 2030 in either a conservative or optimistic direction, and can, by definition, only be an estimate based on assumptions made today about future market conditions and developments.

The potential enterprise value from the metaverse is estimated by modeling the average annual enterprise technology spend per sector and the future metaverse penetration rate in 2030, as a share of metaverse-related corporate technology spending. Data for the innovation and technology spending was derived from sources including Magna, Crunchbase, and IDC. Sector-specific penetration rates were derived from and pressure-tested through 20 interviews with internal and external technology and industry experts. The derived enterprise value calculation considers 19 industry sectors: banking, construction, discrete manufacturing, education, federal and central government, healthcare providers, insurance, media, personal and consumer services, process manufacturing, professional services, resource industries, retail, securities and investment services, state and local government, telecom, transportation, utilities, and wholesale.

The potential consumer value potential is split between existing and net new and emerging metaverse use cases. For existing consumer use cases, the value potential from the metaverse was estimated based on the overall market size and expected future metaverse penetration in each industry in 2030. The penetration rates were derived from expert consultation and internal extrapolation informed by technology

and industry journal articles. Calculations considered the most important consumer uses cases across ten sectors: gaming, e-commerce, live entertainment, education, health and fitness, advertising, digital media, AR/VR hardware, virtual real estate, and non-fungible tokens (including virtual fashion). Market sizes were derived from a number of sources including Magna and IDC. The emerging use-case potential was extrapolated based on assumptions and pressure tested with internal and external industry and technology experts.

The potential value of the metaverse is a bottom-up estimate based on assumptions about future market conditions and developments. Our estimates are to be treated as directional rather than precise at this stage, given the nature of the metaverse and the wide range of uncertainties involved (such as developments in technology, the regulatory environment, and changes in consumer behavior). We have triangulated these estimates across consumer and enterprise verticals, and will continue to refine them in the future. Our team welcomes every challenge and input to refine the calculations. Please write to metaverse.estimate@McKinsey.com to engage in the ongoing sizing discussion.

Metaverse sizing methodology: Forecasting potential value by 2030

Consumer	**1**	**Gaming software**	Discussions with Senior Executives of three globally leading consumer technology and gaming companies
			A significant share of gaming can evolve towards the metaverse - more immersive, massively multiplayer expereinces that venture towards broader digital entertainment - leading to increase in time spent, and new monetization avenues
	2	**eCommerce**	Discussions with eCommerce experts across McKinsey's Digital and Analytics practice globally
			eCom has been venturing towards socially-driven (incl. UGC) commerce already, and will become immersive in the future - offering a more compelling end-to-end experience (search, browse, purchase, post-purchase), introducing new digital/virtual assets, and becoming increasingly personalized
	3	**Live entertainment**	Discussions with Head of Media & Entertainment Technology at leading Hollywood entertainment consultancy; and former Digital Media Practice Leader at a global Tech Services firm
			Live Entertainment can leverage the metaverse for more immersive online+offline experiences, and at greater scale (catering to global audiences concurrently) and frequency
	4	**Education**	Discussion with Senior Executive at globally leading educational products and toys brand
			Education within the metaverse can scale access to virtually 'limiteless' participants (as hardware becomes more ubiquitous), and enhance education delivery and quality, including for adult training/learning experiences
	5	**Health & Fitness**	Discussion with Head of Strategy & Operations at leading technology company
			Health and Fitness can continue to evolve towards remote (and in the case of fitness - social) settings - and improve quality through becoming more immersive (e.g., for service delivery) and collaborative (e.g., in R&D)
	6	**Advertising**	Discussions with Head of Strategy & Operations at leading technology company; and Media and eCommerce expert within McKinsey's Digital and Analytics practice
			The metaverse is expected to assume a higher share of advertising placements and budgets as consumers spend more time in metaverse per day (up to 4-6hrs/d converting from online time spent) and popular gaming worlds expand to broader digital entertainment use-cases (e.g., concerts); with new, more immersive metaverse-native ad-types emerging (e.g., visual search, virtual billboards)
	7	**Digital Media**	Discussions with Head of Media & Entertainment Technology at leading Hollywood entertainment consultancy; and former Digital Media Practice Leader at a global Tech Services firm
			The metaverse can accelerate digital media via net-new revenue streams (e.g., share of virtual asset sales), additional monetization of existing IP, and larger-scale events - and finally, building infrastructure required for the metaverse
	8	**AR/ VR Hardware**	Discussion with Head of Strategy & Operations at leading technology company
			Metaverse device/ interface sales driven by widening appeal for and access to more immersive experiences; with a number of large tech companies ramping up production and expecting decreasing costs over time

	9	**Virtual Real Estate**	Discussion with Metaverse and NFT experts within McKinsey's broader partner ecosystem Virutal Real Estate is expected to become more popular alongside XR, with an increasing number of use-cases, e.g., increasing users and events/ activitiy in metaverse worlds; NFTs of office buildings or architectural designs; and potentially as part of asset diversification strategies for institutions over time
	10	**NFTs (inc. Pure Virtual Fashion)**	Discussion with experts within McKinsey's Apparel, Luxury and Fashion (AF&L) practice Popularity of NFTs driven by more than just novelty over time, e.g., traceability of IP ownership (artist), certification of originality (fashion, sustainability), utility tokens; and the overall move of physical consumer products to online+offline 'twinned' products
Enterprise	11	**Banking**	Discussions with experts within McKinsey's Financial Services practice Banks can scale use-cases in the metaverse for new B2B products/ services (e.g., insurance, payment systems, infrastructure); DeFi structures driving efficiencies and improved user engagement/ service on new products (e.g., contextual finance)
	12	**Construction**	Discussion with Founder/ CEO at leading AI supported construction and manufacturing software company The metaverse can transform the constrution process through data, management, and development. Data: Project real-time monitoring, collecting information and tracking data in metaverse that can later be analyzed; Management: Central coordination and project management of disparse locations (e.g., via IoT/ digital twins); Development: Collaboraiton of dispersed units or suppliers, XR-enabled simulation of planning, details up to “screw-level” (e.g., building architecture)
	13	**Discrete Manufacturing**	Discussion with Founder/ CEO at leading AI supported construction and manufacturing software company Manufacturing will see next-gen industrialization from central coordination, maintanance and service of even locally dispersed units (e.g., via IoT/digital twins); increase in collaboration on R&D; and XR-enabled simulation of manufacturing and assembly- able to plan details up to “screw-level”, while data collection allows project real-time monitoring and ex-post analysis
	14	**Education**	Discussions with McKinsey's North American Education and Technology experts Education within the metaverse can scale access to virtually 'limiteless' participants (as hardware becomes more ubiquitous), and enhance education delivery and quality, including for adult training/learning experiences
	15	**Government (Central/ Federal)**	Discussion with Senior Executive of leading Asian Metropolitan Government Institution; and with McKinsey's experts in the public sector practice Government adoption of metaverse is driven by new avenues to enhance government sector performance and productivity; provide enhanced public services at scale; and the need for new regulation and governance for the metaverse
	16	**Healthcare Provider**	Discussions with McKinsey's healthcare experts across geographies Healthcare improvements can be driven by efficiency gains (e.g., optimized hospital operations, now faster, safer, and more accurate); and improvement in remote diagnostics and procedures; and in remote collaboration

17	**Insurance**	Discussions with experts within McKinsey's Financial Services practice
		Insurance will see efficiencies from decentralized structures; as well as increased demand for new products (e.g., virtual real estate)
18	**Media**	Discussions with Head of Media & Entertainment Technology at leading Hollywood entertainment consultancy; and former Digital Media Practice Leader at a global Tech Services firm
		Media will adopt metaverse for new ad-based revenue streams (e.g., applications/ platforms for the creator economy); and for efficiencies in managing distributed networks (e.g., data centers)
19	**Personal/ Consumer Services**	Discussions with experts in McKinsey's Consumer/ Retail practice
		Personal and Consumer services can profit from more immersive experiences; access at a larger scale, and efficiencies from reduced production costs (and supply chain constraints) for virtual assets
20	**Process Manufacturing**	Discussion with Founder/ CEO at leading AI supported construction and manufacturing software company
		Manufacturing will see next-gen industrialization from central coordination, maintanance and service of even locally dispersed units (e.g., via IoT/digital twins); increase in collaboration on R&D; and XR-enabled simulation of manufacturing and assembly- able to plan details up to “screw-level”, while data collection allows project real-time monitoring and ex-post analysis
21	**Professional Services**	Discussion with experts within McKinsey's Technology, Media and Telco (TMT) practice
		'Utilities' can profit from optimized operations (e.g., faster, safer, and more accurate) and overall project real-time monitoring; and from information and data collection metaverse that aids in optimization
22	**Resource Industries**	Discussion with Founder/ CEO at leading AI supported construction and manufacturing software company
		'Utilities' can profit from optimized operations (e.g., faster, safer, and more accurate) and overall project real-time monitoring; and from information and data collection metaverse that aids in optimization
23	**Retail**	Discussions with experts in McKinsey's Consumer/ Retail practice
		Trade (retail and wholesale both) can adopt metaverse to enhance shopping/in-store/product experience; capture efficiencies; and explore net-new revenue streams (e.g., virtual goods and services)
24	**Securities/ Investment**	Discussions with experts within McKinsey's Financial Services practice
		Securities and investment can leverage metaverse for new B2B products/ services (e.g., investment systems); DeFi structures driving efficiencies; and improved user engagement on new products
25	**Government (Local/ State)**	Discussion with Senior Executive of leading Asian Metropolitan Government Institution; and with McKinsey's experts in the public sector practice
		Government adoption of metaverse is driven by new avenues to enhance government sector performance and productivity; provide enhanced public services at scale; and the need for new regulation and governance for the metaverse

	26	**Telecommunication**	Discussion with Head of Commercial at leading telecommunications Firm; and experts within McKinsey's Tech,Media,Telecoms practice
			Telcos expected to benefit from the need for and monetization potential of enhanced infrastructure (e.g., 5G); as well as productivity improvements in internal operations; and improvements in customer experience (e.g., employee training, service center operations)
	27	**Transportation**	Discussions with McKinsey's logistics and infrastructure practice experts
			Transport sector can benefiy from central coordination and project management (e.g., via IoT/digital twins), especially in logistics; and real-time data collection for optimization
	28	**Utilities**	Discussion with Head of Commercial at leading telecommunications Firm; and experts within McKinsey's Tech,Media,Telecoms practice; and experts within McKinsey's Technology, Media and Telco (TMT) practice
			'Utilities' can profit from optimized operations (e.g., faster, safer, and more accurate) and overall project real-time monitoring; and from information and data collection metaverse that aids in optimization
	29	**Wholesale**	Discussions with experts in McKinsey's Consumer/ Retail practice
			Trade (retail and wholesale both) can adopt metaverse to enhance shopping/in-store/product experience; capture efficiencies; and explore net-new revenue streams (e.g., virtual goods and services)

Appendix C: Consumer and executive surveys

We conducted two global surveys designed to understand trends in metaverse adoption, use, and business implications by sector, geography, type of company, technology, and application. One focused on global end-consumer adoption, the other corporate adoption.

The consumer survey was conducted in May 2022. The final survey sample, after quality checks, consisted of 3,104 end consumers. The survey targeted respondents who indicated, at a minimum, basic understanding of the metaverse and had at least heard of or used one or more metaverse platforms from the following list: *Roblox, Fortnite, Decentraland, Second Life, The Sandbox, Somnium Space, Stageverse, Spatial, World of Warcraft, Pokémon Go, Rec Room, VR Chat,* Facebook *Horizon Worlds,* Microsoft *Altspace,* Microsoft *Mesh, Zepeto, Minecraft,* and *Animal Crossing*. The survey sample covered 11 countries (from Europe, North America, and Asia), excluding respondents working in the marketing, research, or media/advertising industries due to professional focus on innovation and new technology beyond private consumer use cases.

In addition to basic information about respondents and their households, the survey consisted of four groups of questions:

— The first asked respondents about their awareness, excitement, and adoption of activities using metaverse technologies or applications today, and expectations for the future.

— The second asked about current and future user behavior of metaverse-related technology and applications with regard to duration, preferences, and underlying motives. It also asked about purchasing behavior, spending, and engagement with branded experiences.

— The third investigated the usage of avatars, asking respondents to report current and future customization efforts as well as spending on the metaverse for digital assets or awareness of digital influencers.

— The fourth addressed respondents' satisfaction with metaverse experiences and underlying drivers and barriers (risks) for engagement in virtual versus real-life activities across different domains in the respondent's life.

The senior executive survey was conducted in May 2022. The final survey, after quality checks, consisted of C-level executives from 448 companies. The survey targeted respondents who indicated, at a minimum, basic understanding of at least two or more metaverse technologies or applications and their use in business from the following list: cryptocurrencies, non-fungible tokens, the creator economy, Web3, virtual world, edge computing, blockchain, AR/VR, and the cloud. The survey sample covered 15 sectors of the economy, ten countries (from Europe, North America, and Asia), and companies with workforces ranging from fewer than ten people to more than 10,000 employees.

In addition to basic information about the company and the respondent, the survey consisted of four groups of questions:

— The first asked respondents about their awareness and adoption rates of metaverse technologies or applications.

— The second asked about the current and future impact of the metaverse in the respondent's sector, including the most important metaverse technologies. It also asked about parts of the business in which the metaverse was being deployed, and drivers and barriers for metaverse deployment in the respondent's business.

— The third investigated the financial impact of the metaverse, asking respondents to report current and future operating profit margins as well as spending on the metaverse as a share of digital investment.

— The fourth addressed the organizational impact of metaverse technologies, specifically on levels of employment and skills requirements.

Finally, we interviewed 13 senior executives and metaverse experts for their insights into the current state of the metaverse and its potential.

Thanks to all interviewees

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managing partner of EpyllionCo and McKinsey knowledge partner

Kavya Pearlman

founder and CEO of XR Safety Initiative

Cathy Hackl

chief metaverse officer and cofounder of Journey

Marc Petit

VP of Epic Games' Unreal Engine Ecosystem

John Hanke

CEO of Niantic

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Yosuke Matsuda

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Technology

Getting to work in the metaverse

April 05, 2023

PwC's Metaverse Deals Tracker highlights the investments that a broad range of players are making in the next digital platforms.

by Jeremy Dalton

Around the world, companies and investors are getting to work in the metaverse. PwC's Metaverse Deals Tracker, a component of the **Global Entertainment & Media Outlook**, is an ongoing study of the deals, investments, partnerships and product launches made in relation to the platform. The tracker's field of play includes any multiuser virtual worlds, as well as

associated technologies such as virtual reality (VR) and augmented reality (AR) single-user applications, crypto, and non-fungible token (NFT) propositions.

In recent years, there's been a huge amount of hype, projections and, sometimes, cynicism surrounding the metaverse. So, at PwC, we've been at work trying to **demystify the metaverse**. One of the keys to understanding the shape of the emerging new industry is to follow the commercial activity it attracts. Dollars can speak louder than words, and investments indicate where the new technology is gaining traction, what sectors are receiving the most investment, and which sectors are developing.

Since February 2020, we've logged:

106 product announcements

33 partnerships

27 acquisitions

17 funding announcements

Digging into the data further reveals some key initial insights about what's going on in the metaverse.

The metaverse isn't just Meta

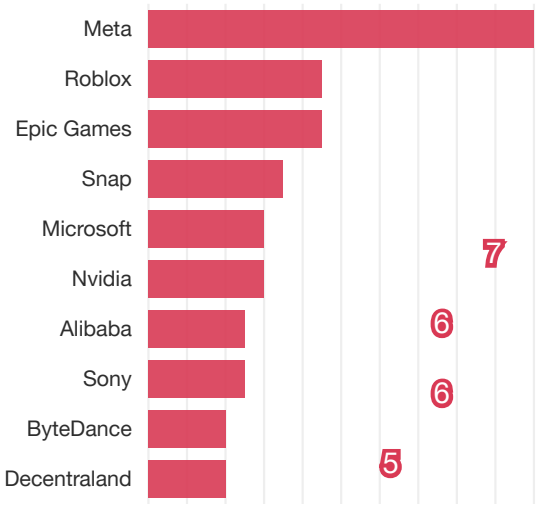
Though Meta Platforms, formerly known as Facebook, has garnered the most press with its large investments, there's a broad range of players investing

in the metaverse. To date, we've identified 127 different entities, ranging from start-ups like Affyn, a Singapore-based company with a play-to-earn model, to well-established companies such as Sony.

In the past three years, Meta has had more than twice the number of activities as the two companies tied for the next highest: Epic Games and Roblox (see 'Frequent investors'). The remainder of the top ten includes a few large organisations such as Alibaba, Microsoft and Snap. That's to be expected, given the resources these firms have to drive such activity.

Frequent investors

The most active players in metaverse investments



Source: PwC analysis

But when it comes to technology and communications, innovation in the next platforms has historically come from outsiders, upstarts and new entrants—not from incumbents. And so, we also see smaller organisations, including Varjo, a Finnish high-end VR hardware manufacturer; DressX, a digital-only fashion house; and Decentraland, an increasingly well-known decentralised metaverse platform that just squeezed into the top ten.

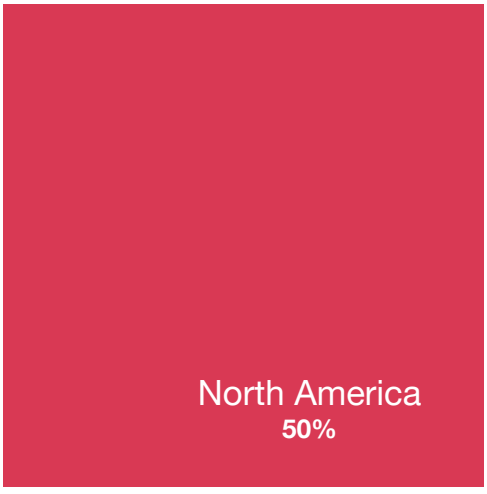
Investments have been focused in North

America and Asia Pacific

Approximately 50% of metaverse activity is in North America, and Asia Pacific accounts for about an additional 27%. The third-place share is halved again, with Western Europe at 14%, and the remainder is split between other geographies.

The world of metaverse investments

Share of transactions by region



Source: PwC analysis

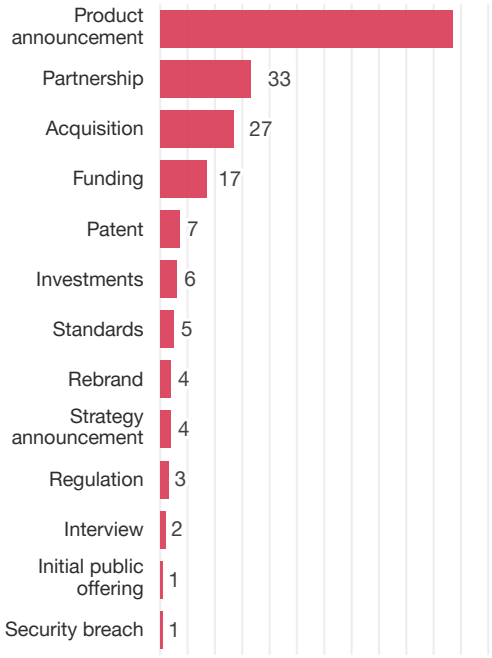
This pattern aligns with the economic impact analysis of VR and AR technologies we conducted in our ***Seeing is believing*** report, which showed North America and East Asia to be key regions. It also tracks with the findings in PwC's most recent **Global Consumer Insights Survey**, which placed India, Indonesia, the US and Vietnam among the countries with the highest percentages of consumers saying they had experienced the metaverse in the previous six months.

A bounty of product announcements

The most significant type of activity concerns product announcements, which account for nearly half (49%) of new developments recorded by the tracker. Partnerships (15%) are next, followed by acquisitions (12%).

Product announcements dominate

Category of activity



Source: PwC analysis

A metaverse that works

Though many of the product announcements and acquisitions centre on entertainment and other business-to-consumer activity, the reality of the metaverse is that it's a set of digital platforms that is appealing to businesses. Several companies are

making investments and introducing products that help other businesses function more effectively. These include Apple's 2020 acquisition of Spaces, which makes VR software for conferencing, Epson's introduction of Moverio AR smart glasses and Nvidia's rollout of digital twinning tools.

Ecosystems are forming

We've thus far focused on the actions of individual companies, and though many individual companies have staked their future on the metaverse, it's clear that the metaverse won't be built by a single player or by companies working in silos. Rather, companies and organisations large and small are teaming up and investing to bring new products and concepts to the market. The city of Milan, Italy, invested in Reasoned Art, the first Italian gallery dedicated to crypto art. Game developer XR Games announced the receipt of approximately US$7 million (£5.9 million) in funding from Media Ventures, Praetura Ventures and Maven, which it will use to expand its studio. And collectID received US$3.5 million in funding from SeventySix Capital, Hellen's Rock Capital and SBI-Sygnum-Azimut DAO Fund to help improve its clothing and accessories metaverse platform.

As mentioned above, there's no shortage of hype—and scepticism—surrounding the metaverse. But despite significant volatility in the capital markets, the

pace of investments in new products and capacity has been remarkably consistent. This is an industry that is maturing and expanding in front of our eyes.

Jeremy Dalton is head of metaverse technologies for PwC. Based in Austin, Texas, he is a director with PwC US. He is the author of ***Reality Check: How Immersive Technologies Can Transform Your Business***.

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Jeremy Dalton is head of Metaverse Technologies at PwC United Kingdom in London. He leads PwC's Metaverse Technologies team, helping clients across all industries successfully implement virtual world technologies, including virtual reality (VR) and augmented reality (AR). He is also the author of *Reality Check*, which delves into how these technologies are being used in businesses all over the world. Mr. Dalton has published books on the subject, given talks all over the world, and has been featured in such media outlets as *The Financial Times*, *The Economist* and the BBC. He has worked with organizations like the World Economic Forum and currently sits on the advisory board of Immerse UK, a U.K. government-backed network, to support the growth of Metaverse technologies in business. Mr. Dalton received his undergraduate degree from the University of Southampton.

Hon. Elizabeth L. Gunn is a U.S. Bankruptcy Judge for the District of Columbia in Washington, D.C., appointed on Sept. 4, 2020. A COVID-era selection and appointment, she was sworn in by Zoom from her living room. Prior to her appointment, Judge Gunn served as an Assistant Attorney General for the Commonwealth of Virginia as the sole the bankruptcy specialist for the Division of Child Support Enforcement. She also practiced law in Richmond, Va., at Sands Anderson PC and McGuireWoods LLP. In 2017, Judge Gunn was honored as a member of ABI's inaugural class of "40 Under 40." She serves on the advisory board of the *American Bankruptcy Law Journal* and the board of the Federal Bar Association Bankruptcy Section, and she is a former board member of the International Women's Insolvency & Restructuring Confederation, a former committee chair of ABI's Consumer Bankruptcy and Litigation Committees, and an associate editor of the *ABI Journal*. Judge Gunn is a member of the Walter Chandler Bankruptcy Inn of Court and is Board Certified in Consumer Bankruptcy Law by the American Board of Certification. She received her B.A. *cum laude* from Willamette University and her J.D. *cum laude* from Boston College Law School.

Dan Jasnow is a partner with ArentFox Schiff LLP in New York, where his practice focuses on advertising, product development and distribution, and intellectual property in the technology, fashion & retail, alcohol & beverage, environmental and consumer products industries. He helps clients understand and mitigate risk as they develop and launch new products and services, expand into new markets, and engage with consumers in-store and online. In addition to his IP and advertising practice, Mr. Jasnow has been at the forefront of the metaverse, NFT and crypto space, drawing on his experience as in-house marketing counsel at Meta Reality Labs (formerly Oculus), where he advised on next-generation consumer electronics and AR/VR software products. He helps brands and creators understand how to do business in the metaverse, including advice on negotiating NFT minting and service agreements, monetization strategies, and IP protection and enforcement. Mr. Jasnow serves on the Future Of XR Advisory Council Working Group on Interoperability and helped ArentFox Schiff become the first major law firm to open an office in the metaverse. He also co-founded and is a proud member of OutFox, ArentFox Schiff's LGBTQ+ affinity group. Mr. Jasnow has handled numerous successful advertising matters before the National Advertising Division of the Better Business Bureau and the National Advertising Review Board, with a focus on consumer electronics and telecommunications. Among other matters, he helped defend performance claims for OLED display technology and satellite reliability; and successfully challenged the reliability of substantiation for mascara volumizing claims. Mr. Jasnow also advises clients on trademark and copyright matters.

Among other things, he advises clients on intellectual property protection and enforcement online, in the metaverse, and on blockchain platforms. He also routinely advises clients on trademark clearance, prosecution, and infringements. In his copyright work, Mr. Jasnow focuses on infringement of digital works, such as streaming video content and copyright in computer software. He has advised clients on blockchain domains, handled several UDRP proceedings, and recovered infringing domain names and social media handles for clients. Prior to joining ArentFox Schiff, Mr. Jasnow served as legislative correspondent and deputy press secretary in the Office of U.S. Senator Jeanne Shaheen and as the candidate's scheduler during her successful 2008 campaign. He is admitted to practice in New York, Maryland and the District of Columbia. Mr. Jasnow received his B.A. *magna cum laude* in 2007 from New York University and his J.D. in 2013 from Georgetown University Law Center.

Cullen Murphy is an executive director with Moelis & Company in New York, where he advises companies and creditors on capital structure initiatives, including liability management and restructurings. He has worked on several cryptocurrency-related cases, including Voyager Digital, Core Scientific and BlockFi. Outside of crypto, he has worked on a number of complex cases in recent years, including *Hertz*, *Party City*, *Sears*, *Skillsoft* and *Medmen*. Mr. Murphy received his B.S. in economics from the University of Denver, his M.S. in mathematics from Fairfield University and his M.B.A. from Cornell University.

Jennifer E. Neubauer is associate general counsel of the Ladies Professional Golf Association in St. Petersburg, Fla. Prior to joining the LPGA as assistant general counsel in September 2022, she spent seven years with Feld Entertainment, which operates Monster Energy Supercross, Monster Jam, Disney on Ice and a number of other live entertainment productions. Ms. Neubauer's practice has spanned across myriad subjects, but is primarily focused on supporting the sales, marketing, media and technology teams, and managing privacy compliance. Within these areas, she has been part of several new business initiatives that are shaping the world of sports and entertainment — from esports to sports betting, and from NFTs to the metaverse. Prior to joining Feld Entertainment, Ms. Neubauer was an associate in DLA Piper's corporate and finance group. She received her B.A. in Russian language and literature from Cornell University in 2009 and her J.D. in 2012 from Boston University School of Law, where she was a member of the *Journal of Science and Technology* and the Intellectual Property Law Society.

AMERICAN BANKRUPTCY INSTITUTE

VALCON 2023

Valuation of Tangible vs. Intangible Assets

Teresa C. Kohl
SSG Capital Advisors, LLC | West Conshohocken, Pa.

Alton Lo
J. Wood Capital Advisors LLC | Santa Rosa, Calif.

David W. Prager
Kroll, LLC | New York

George W. Shuster, Jr.
WilmerHale | New York

Rob Vanderbeek
Grant Thornton LLP | New York

2023

VALCON 2023
May 1-3 | New Orleans, LA

AIRA

VALUATION OF TANGIBLE VS. INTANGIBLE ASSETS

Challenges and Opportunities in Valuing Assets in unique Categories and Contexts

TUESDAY, MAY 2, 2023 * 9:00AM – 10:00AM

VALCON 2023
May 1-3 | New Orleans, LA

AIRA

Moderator:

George W. Shuster, Jr.
WilmerHale

Panelists:

Teresa C. Kohl
SSG Capital Advisors

David W. Prager
Kroll

Alton Lo
J. Wood Capital Advisors

Rob Vanderbeek
Grant Thornton

Unique Asset Categories

Intellectual Property Assets

Consumer & Service Assets

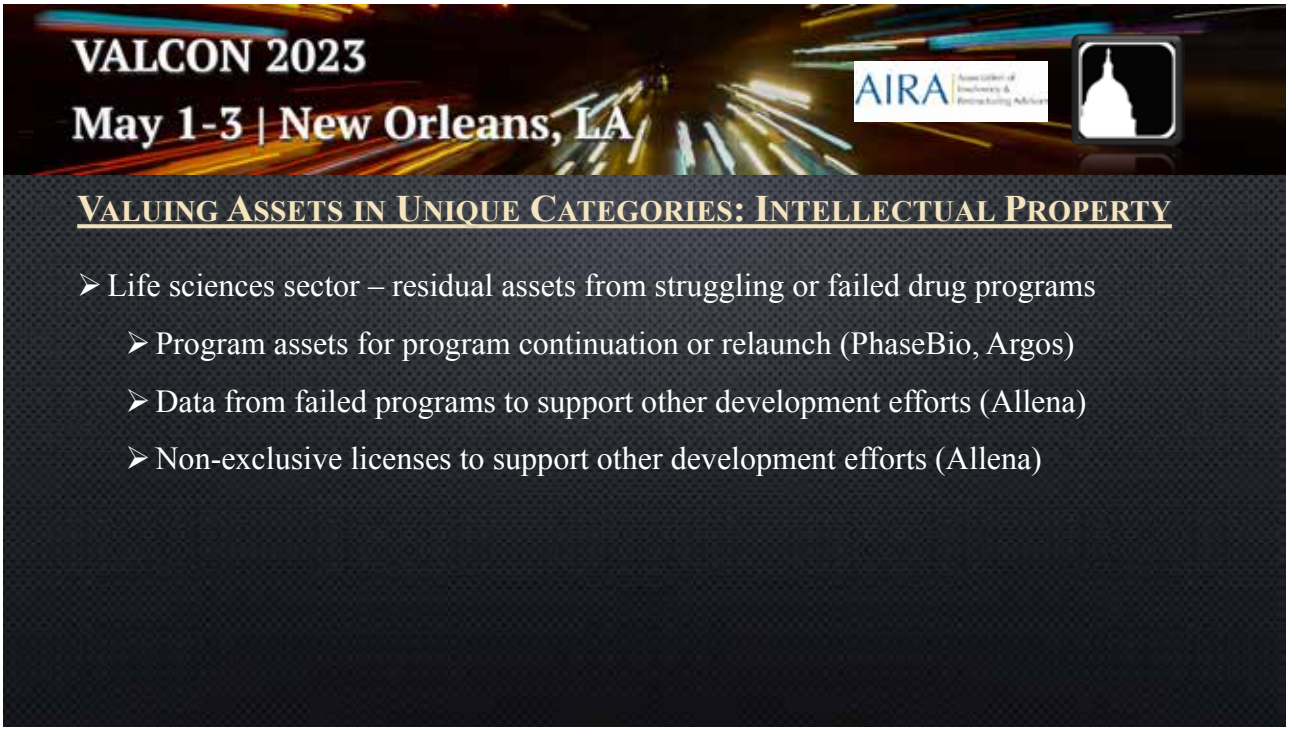
Payment Streams

Unique Valuation Contexts

Financings v. Sales

Bankruptcy 363 Sales v. Chapter 11 Plans

Litigation v. Transactional



Valuing Assets in Unique Categories: Intellectual Property

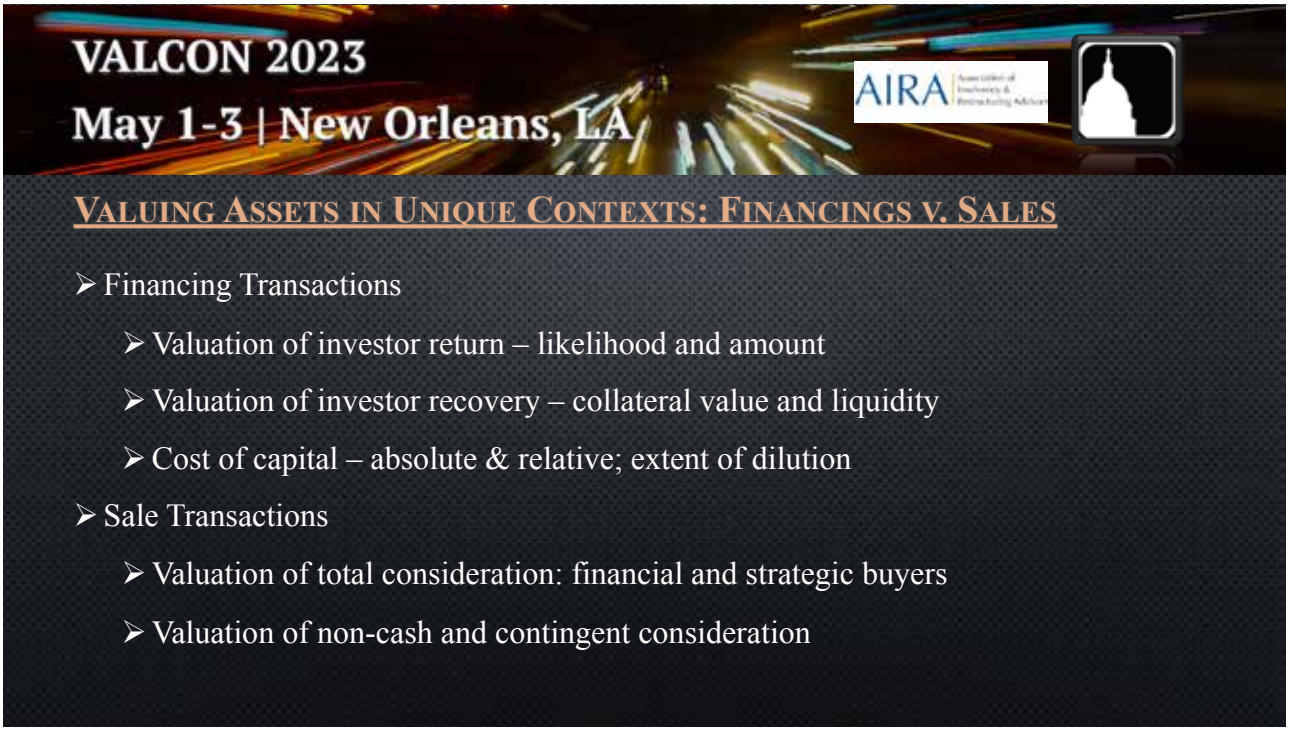
- Life sciences sector – residual assets from struggling or failed drug programs
  - Program assets for program continuation or relaunch (PhaseBio, Argos)
  - Data from failed programs to support other development efforts (Allena)
  - Non-exclusive licenses to support other development efforts (Allena)

VALUING ASSETS IN UNIQUE CATEGORIES: CONSUMER & SERVICE ASSETS

- Failed brick & mortar retail transitioning to online presence or B&M relaunch
  - Recurring insolvencies in toy sector (Toys 'R Us / FAO / KB Toys / eToys)
- Direct to Consumer ("DTC") companies
  - Social media presence & valuing "followers" (Twitter)
  - Consumer lists, URL addresses
- Service Companies – Contract & Non-contractual Relationship Value (*e.g.*, recruiters)

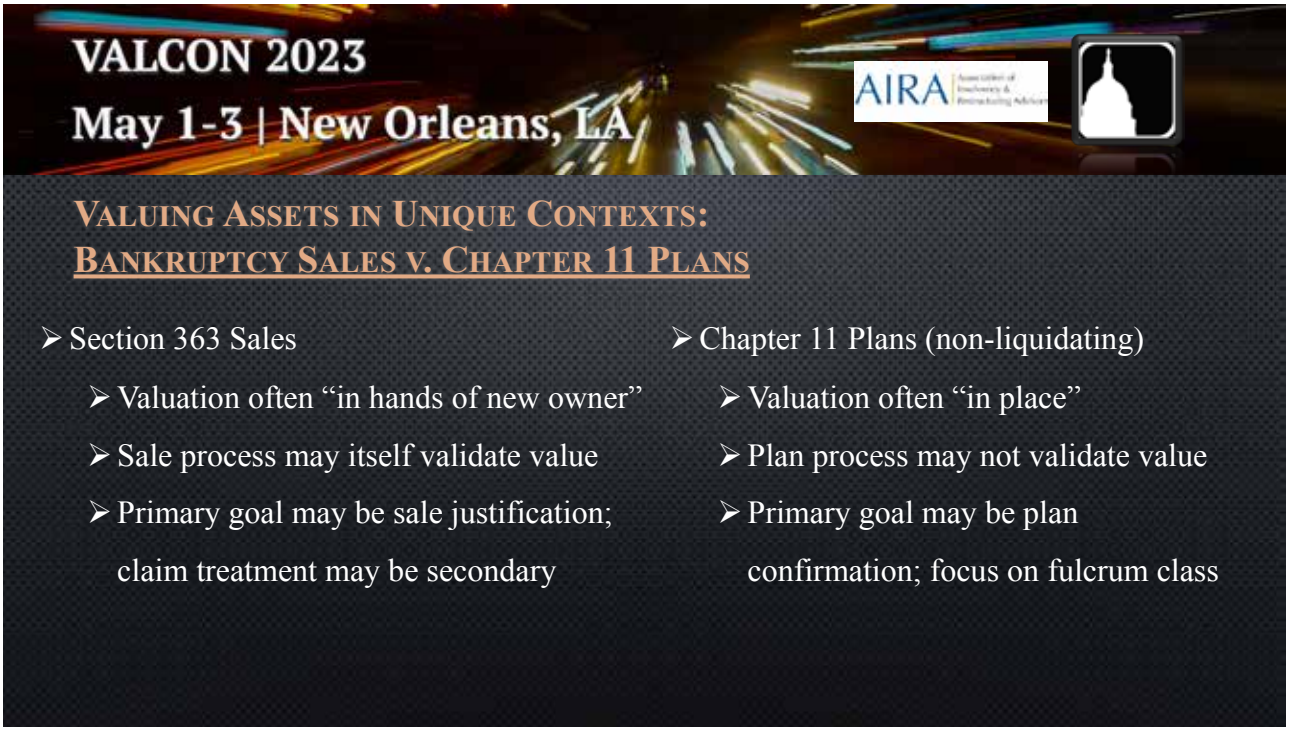
VALUING ASSETS IN UNIQUE CATEGORIES: REVENUE STREAMS

- Life sciences sector
  - Current v. future revenue streams
    - Preclinical, clinical, and commercial revenue streams
  - Actual v. synthetic revenue streams
- Project finance & real estate
  - Travel & entertainment revenue streams in the pandemic environment
  - Commercial rent in the post-pandemic environment
  - Dedicated private & public revenue streams (airport fees, taxes, etc.)



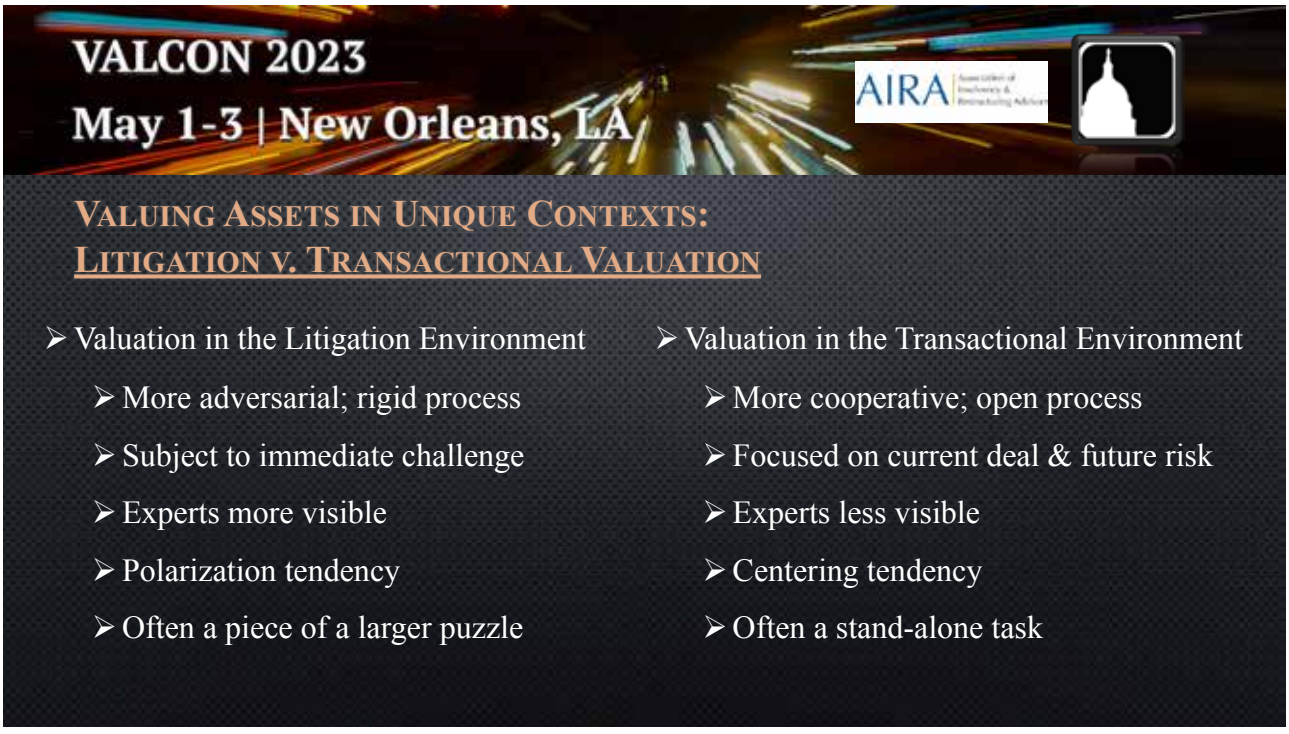
Valuing Assets in Unique Contexts: Financings v. Sales

- Financing Transactions
  - Valuation of investor return – likelihood and amount
  - Valuation of investor recovery – collateral value and liquidity
  - Cost of capital – absolute & relative; extent of dilution
- Sale Transactions
  - Valuation of total consideration: financial and strategic buyers
  - Valuation of non-cash and contingent consideration



Valuing Assets in Unique Contexts: Bankruptcy Sales v. Chapter 11 Plans

- Section 363 Sales
  - Valuation often "in hands of new owner"
  - Sale process may itself validate value
  - Primary goal may be sale justification; claim treatment may be secondary
- Chapter 11 Plans (non-liquidating)
  - Valuation often "in place"
  - Plan process may not validate value
  - Primary goal may be plan confirmation; focus on fulcrum class



Valuing Assets in Unique Contexts: Litigation v. Transactional Valuation

- Valuation in the Litigation Environment
  - More adversarial; rigid process
  - Subject to immediate challenge
  - Experts more visible
  - Polarization tendency
  - Often a piece of a larger puzzle
- Valuation in the Transactional Environment
  - More cooperative; open process
  - Focused on current deal & future risk
  - Experts less visible
  - Centering tendency
  - Often a stand-alone task

Faculty

Teresa C. Kohl is a managing director for SSG Capital Advisors, LLC in West Conshohocken, Pa., and is responsible for originating and leading investment banking transactions, as well as managing SSG's litigation advisory practice. She has completed more than 150 restructuring matters, including refinancing and sale transactions for middle-market companies in bankruptcy proceedings and out-of-court workouts. Prior to her transition to investment banking, Ms. Kohl led financial and operational restructuring engagements for boutique advisory firms. Her past clients include publicly traded, privately held, private-equity sponsored and family-owned companies in the health care, retail, manufacturing, building products and financial services industries. Ms. Kohl is a frequent speaker on financial and operational restructuring issues, bankruptcy, and special-situation transactions, as well as a contributing author to the *Norton Journal of Bankruptcy Law and Practice*. She is a Fellow of the American College of Bankruptcy, and she has served on ABI's Board of Directors and in leadership positions of the Turnaround Management Association (TMA Global), for which she was the first woman to lead TMA's largest global chapter (New York City) as president and co-founded TMA Global's Network of Women. She also is the immediate past board chair of Living Beyond Breast Cancer, a national nonprofit that connects people with trusted breast cancer information and a community of support. Ms. Kohl is a member of the Association of Insolvency and Restructuring Advisors, INSOL International, the International Women's Insolvency and Restructuring Confederation and The Forum of Executive Women. She serves on the steering committee of the Eastern District of Pennsylvania Bankruptcy Conference, and as a mentor for ABI's Diversity and Inclusion Working Group Mentoring Program. Ms. Kohl has received numerous awards, including the Global M&A Network's SHE for SHE Leader Award, the Top Restructuring Investment Banker (2022), The M&A Advisor's Distressed M&A Dealmaker of the Year Award (2021 and 2019) and TMA Global's Outstanding Individual Contribution Award (2017). In addition, she was named a U.S.A. Top Women Dealmaker by the Global M&A Network (2019). Ms. Kohl received her B.S. from Villanova University School of Business.

Alton Lo is a managing director at J. Wood Capital Advisors LLC in Santa Rosa, Calif., where he helps companies evaluate capital structure and raise capital. He is focused on the health care sector and advises clients on convertible debt, royalty/synthetic royalty transactions, clinical trial financings, and other forms of structured financings for life sciences companies. Prior to joining the firm, Mr. Lo worked in the renewable energy industry, and before that, he held a number of positions with J.P. Morgan in San Francisco and has expertise across the entire capital structure. As part of the firm's Corporate Finance Advisory group, he has helped clients evaluate their businesses and access the capital markets best suited for their stage of growth. He also has held roles in equity-linked and derivative capital markets, investment banking, and corporate banking, where he focused on debt financing for health care companies. Mr. Lo is a FINRA-Registered Representative holding Series 7, 79 and 63 licenses. He received his B.A. in economics from Dartmouth College and his M.B.A. from the Tuck School of Business at Dartmouth.

David W. Prager, CFA is a managing director of Kroll in New York, where he leads the company's efforts focused on complex financial situations, restructuring advisory and corporate valuation disputes. He works with clients with complex needs involving corporate value and solvency disputes,

forensic and trading investigations, bankruptcy and restructuring matters, and other complex commercial litigation. Mr. Prager has more than 20 years of experience focusing on restructuring advice and complex commercial litigation, and he has testified extensively and served as a consulting expert in such matters. He recently testified as the primary witness on behalf of Assured Guaranty in its victory in a half billion dollar valuation dispute with Lehman Brothers International respecting credit default swap insurance during the Financial Crisis. He also testified recently with respect to the value available under the Puerto Rico restructuring plan. Mr. Prager has testified in such high-profile, highly contentious bankruptcy disputes as Adelphia, Tribune and Patriot Coal on the fairness of the plans of reorganization, valuation, reasonableness of projections and evaluation of complex value allocation. He also has served as consulting expert on multiple fraudulent conveyance actions. During the Enron bankruptcy, Mr. Prager investigated and valued highly complex and varied assets and formulated proposals for Enron's reorganization. His other testimonial experience includes the value of a Platinum Partners private-equity portfolio (and the solvency conclusions emerging therefrom), and of a medical devices start-up and testimony on behalf of the SEC in a successful enforcement action. Mr. Prager has served as a financial advisor in restructuring matters involving extensive quantitative analysis. In the structured products industry, he served as the interim CFO of Syncora Guarantee and represented creditors in the MBIA restructuring. He also has supported creditors in various corporate (such as Ditech and SemGroup) and municipal (including Detroit and Jefferson County) restructuring matters. Prior to joining Kroll, Mr. Prager spent more than 18 years at Goldin Associates, where he most recently served as a managing director. He also was formerly employed at McManus & Miles, an investment bank specializing in the power-generation industry. Mr. Prager received his B.S. in 1996 from the University of Pennsylvania Wharton School of Business.

George W. Shuster, Jr. is a partner in WilmerHale's Bankruptcy and Financial Restructuring and Debt Finance Groups in New York. He advises companies with respect to financial distress and insolvency matters, both assisting with the structuring of transactions to mitigate financial risk and addressing financial risk when it arises. Mr. Shuster has a particular focus on companies with strong intellectual property assets, specifically regarding financial risk in the life sciences sector. He also advises investors and other creditors with respect to bankruptcy and financial restructuring matters. Mr. Shuster's debt-finance practice focuses on specialty finance arrangements, including receivables, revenue and royalty monetizations, development finance, and structured finance transactions, as well as lending in the distressed environment. He has also published articles on chapter 15 and related issues for the *ABI Journal* and other publications. Mr. Shuster received his undergraduate degree from Columbia College in 1997 and his J.D. from the University of Virginia School of Law in 2000.

Rob Vanderbeek, CIRA, CDBV is a managing director in Grant Thornton LLP's Restructuring Advisory practice in New York. He has 30 years of restructuring, performance improvement and due diligence experience, as well as litigation, valuation and forensic experience in a broad range of industries, including health care, energy, financial services, transportation trucking, manufacturing, mortgage products, real estate, retail, hospitality, equipment leasing and distribution. Mr. Vanderbeek has led many distressed companies through the restructuring and sales process, both in and out of court. He has served managements, boards, secured and unsecured creditors, and other stakeholders with complex corporate restructurings. He also has played key roles in cost reduction and rationalization efforts, as well as liquidity management. Mr. Vanderbeek has served as interim COO and other interim mandates related to complex restructuring cases. He has provided expert testimony in bankruptcy court on DIP financing and cash-collateral needs, and he has served as an expert in support

of as well as in defense of fraudulent conveyance actions. Mr. Vanderbeek has performed solvency analyses and prepared fair-value analyses and reports in support of less than reasonably equivalent value provided for pre-petition businesses transferred. Mr. Vanderbeek served as a board member and audit chair for a New York nonprofit guardianship agency to stabilize operations and reorganize its business. Prior to joining Grant Thornton, he was a managing director at Goldin Associates, a financial advisory boutique, where he was as a member of its Management Committee and ranked in the Top 25 Crisis Management Professionals in Deal League Tables for six years. Before joining Goldin, he was a managing director in the Restructuring Turnaround practice at Huron Consulting Group, worked in the restructuring practices of AlixPartners and PwC Earlier in his career, and was a bank examiner at the Federal Reserve Bank of New York for several years. Mr. Vanderbeek is a member of ABI, the Association of Insolvency Restructuring Advisors, and the Turnaround Management Association. He received his B.S. in finance from Lehigh University, his M.B.A. from NYU Stern School and his J.D. from Pace School of Law.