

Opportunities in the metaverse

How businesses can explore the metaverse
and navigate the hype vs. reality

The elements of a new digital age are converging at scale. **The metaverse is the driving force** bringing these elements together in a unified, immersive experience.

We are not here to suggest the metaverse, as we know it today, will take over all human interactions, but rather, to explore the many exciting opportunities it presents for consumers and brands alike. Whether it's large tech players such as Microsoft planning to create realistic workspaces, or Ariana Grande holding a concert in Fortnite, the opportunities presented by interactive, digital worlds seem limitless. The metaverse will likely infiltrate every sector in some way in the coming years, with the market opportunity estimated at over \$1 trillion in yearly revenues.⁶

As a result, we see companies of all shapes and sizes entering the metaverse in different ways, including household names like Walmart, Nike, Gap, Verizon, Hulu, PWC, Adidas, Atari and others.⁷ Business leaders and boardrooms around the world are now asking themselves, "What is my metaverse strategy? What am I supposed to be doing in the metaverse? What is the metaverse anyway?"

The metaverse offers opportunities to...

Transact

\$54^B

Every year, \$54 billion is spent on virtual goods, almost double the amount spent buying music¹

Socialize

60^B

Approximately 60 billion messages are sent daily on Roblox²

Create

\$80^M

GDP for Second Life was about \$650M in 2021 with nearly \$80M USD paid to creators³

Own

\$41^B

Non-fungible tokens (NFTs) currently have a market cap of \$41 billion⁴

Experience

200

200 strategic partnerships to date with The Sandbox, including Warner Music Group to launch a music-themed virtual world⁵

What is the metaverse?

The metaverse is a seamless convergence of our physical and digital lives, creating a unified, virtual community where we can work, play, relax, transact and socialize. The metaverse is still early in its evolution, and there is no singular, all-encompassing definition to which people can turn. Themes of what the metaverse is and could be, however, are emerging. A key point is that there is no one virtual world but many worlds, which are taking shape to enable people to deepen and extend social interactions digitally. This is done by adding an immersive, three-dimensional layer to the web, creating more authentic and natural experiences. The metaverse even has the promise of facilitating accessibility from the comfort of the home, breaking down boundaries and democratizing access to key goods, services and experiences.

Before diving deeper into the metaverse, it's important to lay the foundation between features of today's metaverse—Web 2.0 characteristics, and the emerging Web 3.0 characteristics. While the table below highlights our assessment of the key metaverse features between the two, the lines are blurring as more and more traditional virtual worlds are adopting elements of the blockchain-based worlds.



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Web 2.0 versus Web 3.0 approach to the metaverse

	Web 2.0	Web 3.0	
PLATFORM CHARACTERISTICS	Example virtual worlds	<ul style="list-style-type: none"> • Second Life • Roblox • Fortnite • World of Warcraft 	<ul style="list-style-type: none"> • Decentraland • The Sandbox • Somnium Space • Cryptovoxels
	Organizational structure	<ul style="list-style-type: none"> • Centrally owned • Decisions are based on adding shareholder value 	<ul style="list-style-type: none"> • Community governed, generally through a foundation decentralized autonomous organization (DAO) • Native tokens are issued and enable participation in governance • Decisions are based on user consensus
	Data storage	<ul style="list-style-type: none"> • Centralized 	<ul style="list-style-type: none"> • Decentralized (game assets)
	Platform format	<ul style="list-style-type: none"> • PC/console • Virtual reality (VR)/augmented reality (AR) hardware • Mobile/app 	<ul style="list-style-type: none"> • PC • Virtual reality (VR)/augmented reality (AR) hardware • Mobile/app coming soon
	Payments infrastructure	<ul style="list-style-type: none"> • Traditional payments (e.g., credit/debit card) 	<ul style="list-style-type: none"> • Crypto wallets
	Digital assets ownership	<ul style="list-style-type: none"> • Leased within platform where purchased 	<ul style="list-style-type: none"> • Owned through non-fungible tokens (NFT)
USER INTERACTION	Digital assets portability	<ul style="list-style-type: none"> • Locked within platform 	<ul style="list-style-type: none"> • Transferable
	Content creators	<ul style="list-style-type: none"> • Game studios and/or developers 	<ul style="list-style-type: none"> • Community • Game studios and/or developers
	Activities	<ul style="list-style-type: none"> • Socialization • Multi-player games • Game streaming • Competitive games (e.g., esports) 	<ul style="list-style-type: none"> • Play-to-earn games • Experiences • (Same activities as Web 2.0, see box on left)
	Identity	<ul style="list-style-type: none"> • In-platform avatar 	<ul style="list-style-type: none"> • Self-sovereign and interoperable identity • Anonymous private-key-based identities
COMMERCIALS	Payments	<ul style="list-style-type: none"> • In-platform virtual currency (e.g., Robux for Roblox) 	<ul style="list-style-type: none"> • Cryptocurrencies and tokens
	Content revenues	<ul style="list-style-type: none"> • Platform or app store earns 30% of every game purchased; 70% goes to developer (example model)⁸ 	<ul style="list-style-type: none"> • 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

Why metaverse? Why now?

The concept of a metaverse is not a new one. In many ways this is a linear progression. Online, multi-player, role-playing worlds like The Sims or Second Life have been around for nearly 20 years, with players spending an average of 20 hours per week in these worlds.⁹ Modern equivalents like Minecraft, World of Warcraft and Fortnite have hundreds of millions of users, and huge supporting economies.

We are now at an inflection point, where it seems that not a day goes by without a company or celebrity announcing that they are building a presence in a virtual universe. While the buzz can partially be attributed to attention-grabbing headlines, there is a convergence of emerging trends. A number of new technologies have come together to enable this vision of the metaverse. Augmented reality (AR) and virtual reality (VR) headsets have become cheaper and more powerful, improving the user experience. Blockchain has enabled digital currencies and NFTs. The new methods to transact and own digital goods are allowing creators to monetize their activities through tokens. In addition to monetization, and as a means to exchange value, token-holders can also participate in the platform's governance (e.g. vote on decisions). This democratic ownership economy coupled with the possibility of interoperability, could unlock immense economic opportunities, whereby digital goods and services are no longer captive to a singular gaming platform or brand.

From a social perspective, the development of more immersive virtual experiences is helping people to build communities based on shared values, and to express themselves in more authentic ways. Meanwhile, COVID-19 accelerated the digitization of our lives and normalized more persistent and multi-purpose online engagement and communication. It is this combination of technological, social and economic drivers that is resulting in the explosive interest in the metaverse.



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Co-Author, Adit Gadgil, explores gallery in Decentraland

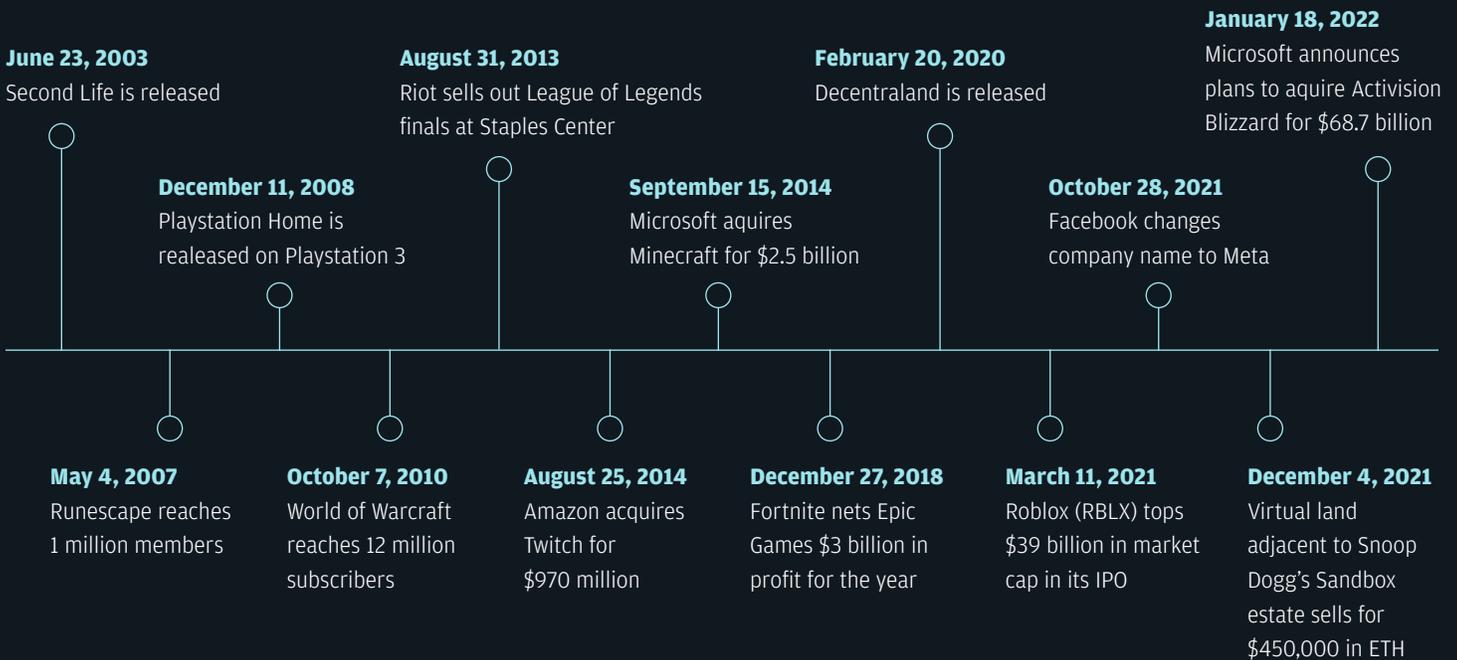
Source: Decentraland

Metanomics

When you think about the economics of the metaverse—or metanomics—there are opportunities in almost every market area. Imagine you have an online avatar and you want to change what it/you are wearing, you will be able to buy limited-edition, digitally branded clothing that you pick after browsing a virtual showroom. Or you may start your own small business, such as an art gallery where you display your latest and greatest collections, or a virtual private club.

How the metaverse has evolved

The metaverse is evolving from two decades of gaming and will be built upon gaming infrastructure



Source: Galaxy Digital Research

Timeline does not reflect a complete picture of all companies accepting or facilitating cryptocurrency donations.

The growth of the ownership economy

Metanomics is not a new term or concept. Its origins lead back to 2007 when a Cornell professor, Rob Bloomfield, hosted a course on the subject in Second Life.¹⁰ Many of the themes Bloomfield covered resonate today, including drawing parallels between the physical and digital real estate markets. However, a key difference today is the ownership economy, driven by the advent of Web 3.0. If you want to personalize a virtual home, you can purchase an original piece of art, tokenized as a digital asset. You can even own the land the house is built on. Ethereum-based platforms like Decentraland, for example, are already selling virtual plots that people can develop. Virtual real estate is a growing market. The average price of a parcel of land doubled in a six-month window in 2021. It jumped from \$6,000 in June to \$12,000 by December across the four main Web 3.0 metaverses.¹¹ Partly this growth has been because brands have been buying up space so they can create virtual stores and other experiences. In June 2021, one land package in Decentraland was sold for \$913,000, with the developer Everyrealm turning it into an entire shopping district, Metajuku (inspired by Japan's Harajuku shopping district).¹²



\$12,000

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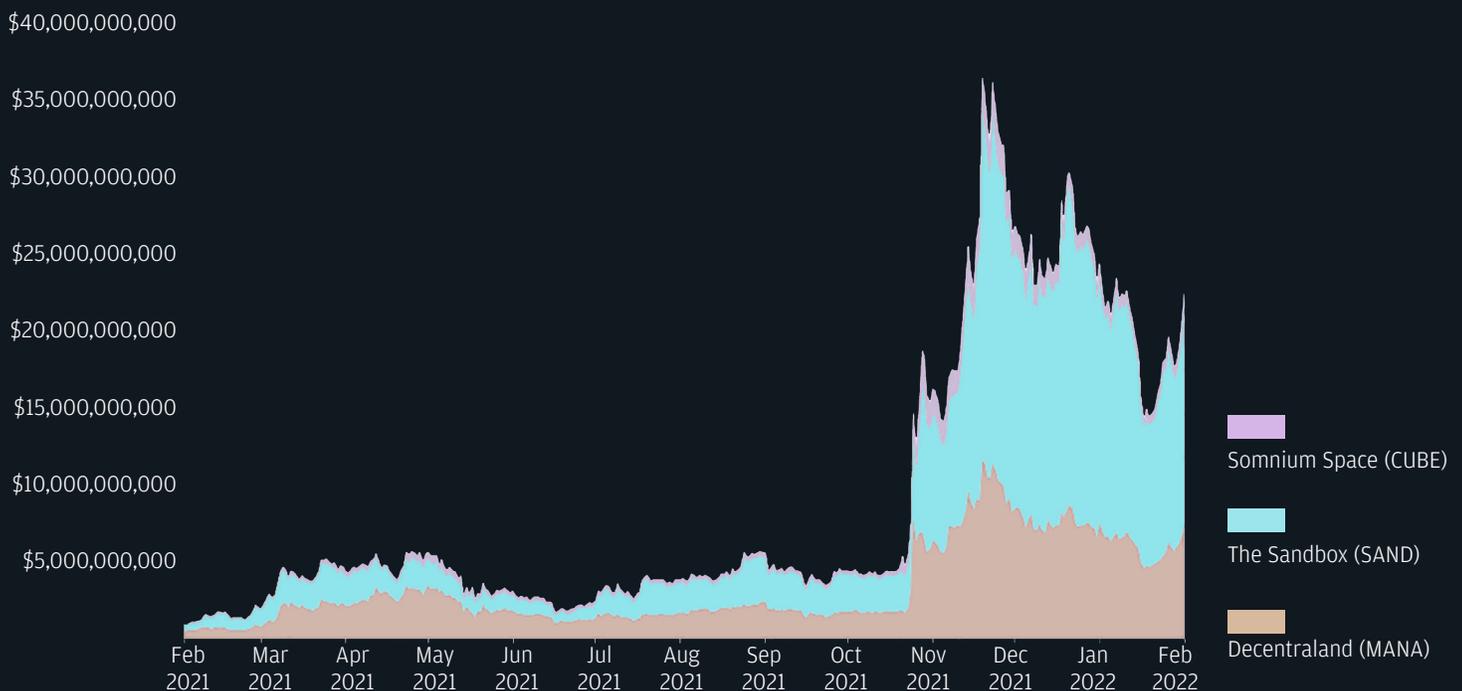
Second Life has enabled differentiated experiences

Source: Second Life

From DeFi to DAO

In time, the virtual real estate market could start seeing services much like in the physical world, including credit, mortgages and rental agreements. However, with the emergence of decentralized finance (DeFi), collateralized lending primitives and the composability of blockchain token-based digital assets, a next-generation financing company could potentially leverage digital clothing as collateral to underwrite virtual land and property mortgages. In fact, the financing company may not be a company at all, but instead, a self-organizing, mission-based community of people (who may not have met at all in person), also known as a decentralized autonomous organization (DAO). The DAO may have seeded its original balance sheet into a multi-signature wallet to create the mortgages. An additional layer of tokenomics to incentivize certain participant or community behaviors creates another level of gamification and commercialization.

Surge in market cap of tokens in major metaverse platforms after Facebook's rebranding to Meta



Source: The Block

Work in the metaverse

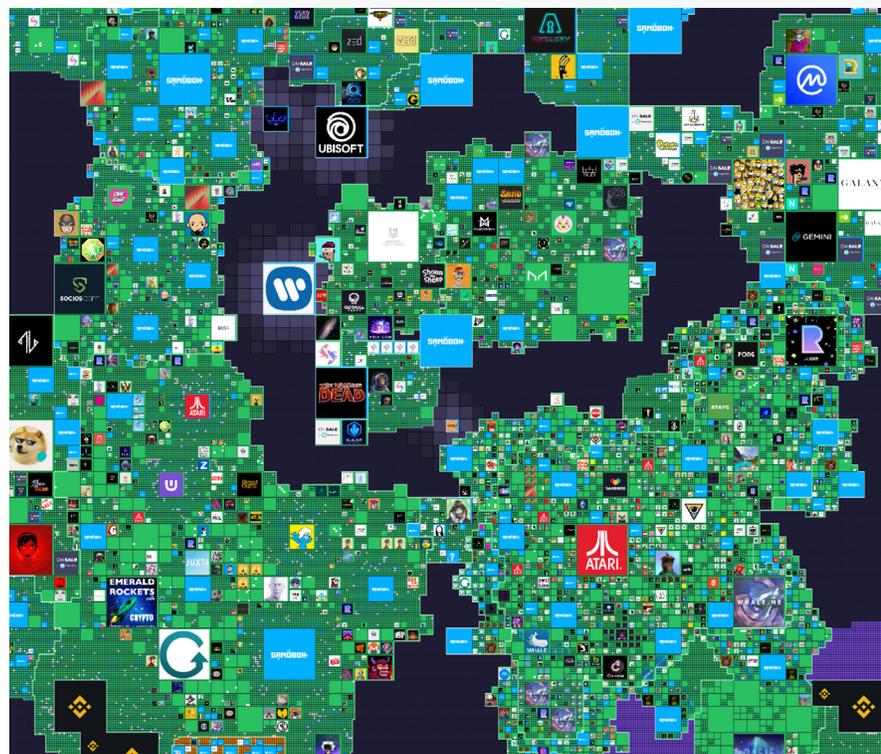
Supply and demand dynamics are driving more people into the meta-economy. This, in turn, will necessitate the development of new skills and generate new opportunities to make money. After all, people will have to develop and build the products that are consumed in the virtual world—establishing huge opportunities for the creator economy. RTFKT is a virtual shoe designer that has recently been acquired by Nike.¹³ It has created an interesting bridge between digital and physical merchandise (NFT owners receive physical sneakers that match their NFTs), and is building an ecosystem of avatars, spaces and digital products, in addition to wearables. In a recent auction, RTFKT sneakers sold for up to \$10,000 a pair.¹⁴ By contrast, some people will earn their livings providing services—the gig workers of the metaverse. For instance, if you are planning a virtual party and want musical entertainment, you could hire a singer or a DJ to perform. Virtual concerts have the potential to be more profitable than physical concerts, which deal with barriers such as capacity and parking. Recently, a major concert held in Fortnite was seen by 45 million people¹⁵ and grossed around \$20 million, including sales of merchandise.¹⁶ People who otherwise would not have had access to such experiences, due to geography or cost, can now participate.

It will be interesting to see how marketing and advertising pans out, as it is potentially one of the biggest segments of the meta-economy. There are huge opportunities for branding and immersive ad experiences in virtual worlds due to the mass audiences available. As with the current generation of social media companies, advertising is the model that many platforms use to generate revenue. In-game ad spending is set to reach \$18.41 billion by 2027.¹⁷



\$18.41B

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One of the main metaverse platforms, The Sandbox's brand map, reflecting 200 partnerships

Source: The Sandbox

Expanded opportunities across industries and countries

It is not just business-to-consumer environments that will benefit. The metaverse will provide a massive opportunity for business-to-business enterprises. Take a manufacturer that is buying new parts for its equipment. Presently, the process involves receiving a physical brochure or an emailed PDF with static 2D pictures. In the metaverse, users could test the products in a virtual environment at lower cost. Imagine being able to build a complex digital twin of a factory or industrial space at massive scale, and test how robotics systems will interact with the physical environment.

One of the great possibilities of the metaverse is that it will massively expand access to the marketplace for consumers from emerging and frontier economies. The internet has already unlocked access to goods and services that were previously out of reach. Now, workers in low-income countries, for example, may be able to get jobs in western companies without having to emigrate. Educational opportunities will also expand, with VR worlds being a low-cost and effective way to access training. With these developments there will also have to be clear governance.

From a corporate perspective, there are opportunities to massively scale. Instead of having stores in every city, a major retailer might build a global hub in the metaverse that is able to serve millions of customers. Beyond retailers, the metaverse will turbocharge the shift in gaming, sports betting and gambling from cash to crypto. Companies such as Sightline Payments, that have built infrastructure to support cashless digital gaming for live sports and casinos, are ideally placed to capitalize on the opportunity as these industries rapidly transition to offering experiences to gamers in the metaverse.



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J.P. Morgan team explores Metajuku in Decentraland

Source: Decentraland

Navigating **hype** vs. reality

Despite much excitement about the possibilities of the metaverse, in order to enable its full potential for engagement, community building, self-expression and commerce, key areas need to be further developed and matured. We see these as new opportunities for teams, projects, DAOs, businesses, technology providers and financial institutions to flourish and collaborate together in vibrant ecosystems that address the following areas:

Technology



Commercial infrastructure



Privacy and identity



Workforce of the future



Regulation, tax, accounting and social infrastructure



Technology

From a technological perspective, some key imperatives for the growth of the metaverse are:

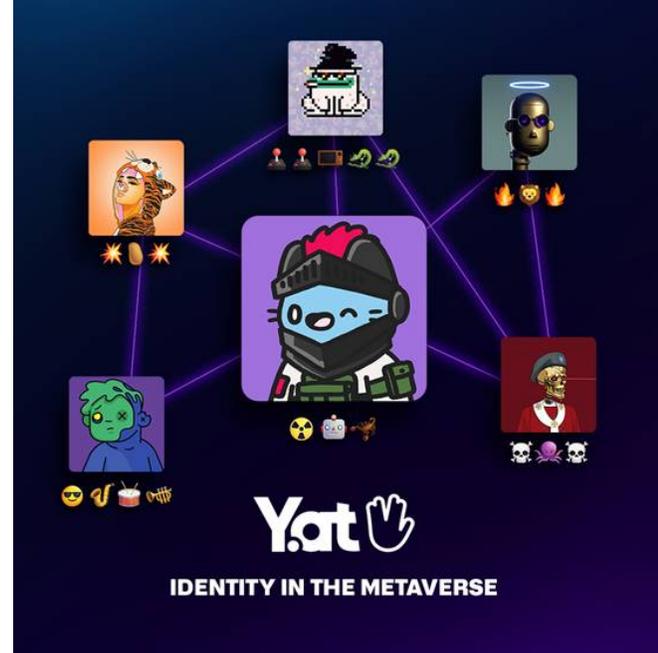
- Improved performance in avatar movement and environment rendering
- Reduction of environment 'sharding' so all participants can interact with each other live in the same location
- More capacity to support complexity in design and interactions
- Reduction of local hardware requirements for complex interactions with 3D rendering
- Expanded accessibility across devices (including mobile)
- Development of interoperability or cross-virtual world interactions, and ways to manage engagement and digital assets across these platforms (think of it like being able to seamlessly change channels on the television)
- Definition of standards for digital assets (wearables, objects, brands) and virtual/ cryptocurrencies, so they can be transferable across various virtual worlds (with potentially different manifestations in each world, e.g., the same NFT manifests as a special edition t-shirt in a virtual world but is a uniquely designed vehicle in a race car video game)
- Advanced discovery mechanisms such as the ability to find friends or recommendations on things to do, places to visit, and customized virtual goods to shop
- Expanded data analytics and reporting for virtual spaces. These will be specifically designated for commercial and marketing usage and will track business key performance indicators (this already exists in some worlds, such as Cryptovoxels)



Commercial infrastructure

Some key elements to support commerce and the meta-economy still need to be determined and scaled, including:

- Web 3.0 virtual world integrations with legacy traditional finance payment rails (e.g., credit cards, pay by bank, debit, automated clearing house/wires)
- Web 2.0 virtual world integrations with crypto payments and NFT/digital assets marketplace commerce
- Single wallet user experience, inclusive of:
 - Web 2.0 traditional finance payment rails, virtual currencies and virtual assets
 - Web 3.0 crypto, NFTs and digital assets
 - Digital identity verifiable credentials, know your customer (KYC)/anti-money laundering (AML) compliance keys, and reputation points
 - Multiple aliases to preserve privacy and enable digital freedom
- Evolution of virtual/cryptocurrencies and digital asset backed financing and mortgages through using lending models, or leveraging decentralized finance (e.g., NFT-collateral backed virtual world mortgages)
- Creation of cross-border and cross-metaverse foreign exchange and liquidity solutions
- Improved user experience for mainstream adoptions of non-crypto/Web 3.0 natives
- Expansion of solutions and services to support DAO community-based projects, business ventures and investments



Yat enables expression of your identity with emojis

Source: Yat



Privacy and identity

User identification and privacy safeguards will be crucial for both interacting and transacting in the metaverse.

- Preservation of one's ability to have multiple avatars/identities, with the addition of:
 - Private KYC/AML-compliant commerce and payments
 - Verifiable credentials that can be easily structured to enable easier identification of fellow community/team members, or to enable configurable access to varying virtual world locations and experiences
 - Prevention against cyberbullying or online harassment/assault across virtual worlds
- Expansion of NFT token-gated spaces to include the creation of private interactions, discussion and messaging



Workforce of the future

What will the future of work in the metaverse look like? Some key areas to consider include:

- Training new designers and developers with specialization in 3D modelling of avatars, wearables, objects, architecture and interiors, leveraging virtual world-specific software development kits (SDKs)
- Evolution of content creators and storytellers that can span across virtual worlds, virtual goods, NFTs, token gates, (varying manifestations of NFTs across platforms), commerce and communities
- Redeployment of event producers that specialize in metaverse experiences (concerts, parties, art showings, community meetings, sports events, sightseeing and travel)
- Creation of community managers focused on creating robust online and offline relationship-building and interactions to strengthen platform engagement and stickiness



Adidas NFT project with Bored Ape Yacht Club (ape Indigo Herz)

Source: Adidas



Regulation, tax, accounting and social infrastructure

When it comes to the regulatory framework that will govern the metaverse, there are many open questions that need to be addressed, including:

- Paved paths on regulatory, tax and accounting treatment of Web 3.0 digital real estate/property, and virtual world commercial transactions
- Adept navigation of regulatory, tax and accounting treatment of primarily Web 2.0 virtual worlds with Web 3.0 digital assets
- Solutions and services to support virtual worlds that are globally accessible, but may be required to adhere to local jurisdictional requirements and rules in commerce and payments
- Evolution of community governance (e.g., Who sets rules in the virtual worlds? Who governs?)



What's your 'metaverse strategy'?

In the metaverse, some of the existing services and business models we are familiar with will continue to exist, but the metaverse opens a whole new realm of ways to engage which we expect will lead to uniquely new services and business models. Not everything in the metaverse will be relevant for every business. However, there is little downside to taking the opportunity to explore.

Learn

There are many different interpretations of the metaverse, and various angles to learn about beyond the content here.

Assess

While the metaverse will scale across many industry verticals, evaluate if there are relevant opportunities for your business.

Create

Gain experience through internal development. Take the opportunity to explore creative consumer engagement through new channels, services, experiences, digital goods and assets. Start small and move fast. Test and learn.

Connect

Start building a network of metaverse ecosystem participants. The world is still small, so high quality collaborations and partnerships are still available at a reasonable level of investment. Connect with a new generation and tap into alternative talent pools.

Establish

Get your business out there and position yourself to capture the hearts and minds of tech-forward sub-communities.

Gallery in Cryptovoxels

Source: Consensys

Some key questions to consider include:

- How would your business model and/or overall organization be impacted if there was more time spent interacting, transacting and socializing in virtual worlds? Would there be any impact at all?
- If your business and brand were in the metaverse, what value could you create for the community? Would you be a participant or a service provider?
- What are the authentic experiences and services of my organization that make sense in a virtual ecosystem?
- If you are a consumer-facing brand, is there an opportunity to create new marketing channels through experiences, digital goods, sponsorships and a branded real estate presence?
- Do you have the in-house talent to help you navigate the metaverse? Is there a video game and/or crypto enthusiast on the team that you can spotlight and position to help educate the broader organization?
- If you want to have a presence or create an experience in the metaverse, do you have the in-house skillsets to do it yourself?
- Business in the real world remains the priority. If your business is limited in time and economic resources, what is the magnitude of value accrued from being perceived as a first mover in an emerging sector?
- How important is it to your business to target a younger generation audience and tech-forward sub-communities?
- Do your competitors have a presence in the metaverse?

Our approach to the metaverse

The success of building and scaling in the metaverse is dependent on having a robust and flexible financial ecosystem that will allow users to seamlessly connect between the physical and virtual worlds. Our approach to payments and financial infrastructure will allow that interoperability to grow.

We believe the existing virtual gaming landscape (each virtual world with its own population, GDP, in-game currency and digital assets) has elements that parallel the existing global economy. This is where our long-standing core competencies in cross-border payments, foreign exchange, financial assets creation, trading and safekeeping, in addition to our at-scale consumer foothold, can play a major role in the metaverse.

We are building and scaling new emerging technologies to modernize infrastructure and business models including but not limited to tokenization and digital identity, as we strive for perpetual innovation and better ways to organize financial transactions and payments in the decentralized web.



The Onyx by J.P. Morgan lounge in Decentraland
Source: Decentraland

In enabling the gaming ecosystem, we focus on three verticals:

Industrializing game platform providers with bank-grade products and digital assets platform access

- Offering enterprise-grade digital assets infrastructure alongside more than half a decade of expertise in Web 3.0/blockchain/crypto
- Supporting onboarding through specialized products focused on account validation, sanctions screening, transaction status and fraud prevention
- Providing robust security and required certifications

Enabling game and content creators to more easily commercialize their creations

- Leveraging our enterprise-grade and secure Ethereum virtual machine-based zero gas fees blockchain platform reduces the complexity, costs and risks involved with building bespoke infrastructure and determining which blockchain protocol to build on in a time of rapid innovation and uncertainty
- Reducing friction in increasing content creator enrollment through simple registration, onboarding and KYC
- Offering a full suite of payout services including flexible and configurable virtual wallets that support multiple payout methods, account structures, micro loans and account validation

Scaling the metaverse industry worldwide across multiple currencies and payment methods

- Creating custom solutions with assets such as embedded and interoperable stored value virtual wallets, flexible single pay or multiple pay options, fast and secure checkout, and the ability to support more than 120 currencies¹⁸



The bottom line

The components of the metaverse continue to evolve very quickly. It is difficult to base a business strategy on such a dynamic space, characterized by explosive growth and the continuous innovation of new entrants. However, the costs and risks of engaging early and consistently in order to build internal intellectual property, develop hypotheses about future business models, and identify ecosystem partners and collaborators are relatively low. The asymmetrical risk of being left behind is worth the incremental investment needed to get started and to explore this new digital landscape for yourself. [Explore the Onyx by J.P. Morgan lounge in Decentraland.](#)

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By Christine Moy, former Onyx by J.P. Morgan executive and Adit Gadgil, Head of E-commerce and Technology, Media & Telecommunications, J.P. Morgan Payments

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- ¹ MatthewBall.vc, June 2021. 'Payments, Payment Rails, and Blockchains, and the Metaverse.' Available at: <https://www.matthewball.vc/all/metaversepayments>. Accessed January 2022.
- ² Bloomberg Intelligence Podcast, November 2021. 'Developments, Investments & Experiences in the Metaverse.' Into the Metaverse. <https://podcasts.apple.com/us/podcast/developments-investments-experiences-in-the-metaverse/id1593908027?i=1000540906629>. Accessed January 2022.
- ³ Zdnet.com, January 2022. 'High Fidelity invests in Second Life to expand virtual world.' Available at: <https://www.zdnet.com/article/high-fidelity-invests-in-second-life-to-expand-virtual-world/>. Accessed January 2022.
- ⁴ Bloomberg, 'NFT Market Surpassed \$40 Billion in 2021, New Estimate Shows.' Available at: <https://www.bloomberg.com/news/articles/2022-01-06/nft-market-surpassed-40-billion-in-2021-new-estimate-shows>. Accessed January 2022.
- ⁵ LedgerInsights.com, January 2022. 'Warner Music partners with Sandbox blockchain game for music events.' Available at: <https://www.ledgerinsights.com/warner-music-partners-with-sandbox-blockchain-game-for-music-events/>. Accessed January 2022.
- ⁶ Grayscale, November 2021. 'THE METAVERSE Web 3.0 Virtual Cloud Economies.' Available at: https://grayscale.com/wp-content/uploads/2021/11/Grayscale_Metaverse_Report_Nov2021.pdf. Accessed January 2022.
- ⁷ CNBC.com, January 2022. 'Walmart is quietly preparing to enter the metaverse.' Available at: <https://www.cnbc.com/2022/01/16/walmart-is-quietly-preparing-to-enter-the-metaverse.html>. Accessed January 2022.
- CNBC.com, November 2021. 'Nike is quietly preparing for the metaverse.' Available at: <https://www.cnbc.com/2021/11/02/nike-is-quietly-preparing-for-the-metaverse.html>. Accessed January 2022.
- Marketing Dive, October 2021. 'Verizon showcases 5G with metaverse treasure hunt.' Available at: <https://www.marketingdive.com/news/verizon-showcases-5g-with-metaverse-treasure-hunt/607746/>. Accessed January 2022.
- Coindesk, January 2022. 'Hulu Targets 'Streamers of Tomorrow' as it Seeks Candidates With Metaverse, NFT Backgrounds.' Available at: <https://www.coindesk.com/business/2022/01/15/hulu-targets-streamers-of-tomorrow-as-it-seeks-candidates-with-metaverse-nft-backgrounds/>. Accessed January 2022.
- Wall Street Journal, January 2022. 'Accounting Firms Scoop Up Virtual Land in the Metaverse.' Available at: <https://www.wsj.com/articles/accounting-firms-scoop-up-virtual-land-in-the-metaverse-11641599590/>. Accessed January 2022.
- Adidas.com, January 2022. 'Adidas Originals and Prada Announce a First-Of-Its-Kind Open-Metaverse & User-Generated NFT Project.' Available at: <https://news.adidas.com/originals/adidas-originals-and-prada-announce-a-first-of-its-kind-open-metaverse---user-generated-nft-project/s/30a29dad-6ded-4302-ae40-f9f2338e7298>. Accessed January 2022.
- DataDrivenInvestor, December 2021. 'Atari Token: Going Metaverse With the Atari Casino.' Available at: <https://medium.datadriveninvestor.com/atari-token-going-metaverse-with-the-atari-casino-1deb037959ab>. Accessed January 2022.
- ⁸ MatthewBall.vc, June 2021. 'Payments, Payment Rails, and Blockchains, and the Metaverse.' Available at: <https://www.matthewball.vc/all/metaversepayments>. Accessed January 2022.
- ⁹ The Deadalus Project, 'MMORPG Hours vs. TV Hours.' Available at: <http://www.nickyee.com/daedalus/archives/000891.php> Accessed February 2022.
- ¹⁰ Cornell Chronicle, October 2007. 'Students get a 'Second Life' in first 'metanomics' course.' Available at: <https://news.cornell.edu/stories/2007/10/johnson-school-professor-uses-virtual-reality-class>. Accessed February 2022.
- ¹¹ Republic Realm, 'The 2021 Metaverse Real Estate Report.' Available at: <https://www.republicrealm.com/post/the-2021-metaverse-real-estate-report>. Accessed February 2022.
- ¹² The Block, June 2021. 'Decentraland estate that sold for \$913,000 will become a virtual shopping district.' Available at: <https://www.theblockcrypto.com/post/109960/decentraland-estate-that-sold-for-913000-will-become-a-virtual-shopping-district>. Accessed January 2022.
- ¹³ Nike, December 2021. 'NIKE, Inc. Acquires RTFKT.' Available at: <https://news.nike.com/news/nike-acquires-rtfkt>. Accessed January 2022.
- ¹⁴ BoF, December 2021. 'Nike Acquires Virtual Fashion Start-Up RTFKT.' Available at: <https://www.businessoffashion.com/articles/technology/nike-acquires-virtual-fashion-start-up-rtfkt/>. Accessed January 2022.
- ¹⁵ ESPN, July 2020. 'Billboard: Travis Scott's Astronomical drew more than 45 million viewers.' Available at: https://www.espn.co.uk/esports/story/_/id/29532117/billboard-travis-scott-astronomical-drew-more-45-million-viewers. Accessed January 2022.
- ¹⁶ Forbes.com, November 2020. 'How hip-hop superstar Travis Scott has become corporate America's brand whisperer.' Available at: <https://www.forbes.com/sites/abrambrown/2020/11/30/how-hip-hop-superstar-travis-scott-has-become-corporate-americas-brand-whisperer/?sh=12adcfff74e7>. Accessed January 2022.
- ¹⁷ IPS, October 2021. 'IN-GAME ADVERTISING MARKET TO REACH USD 18.41 BILLION BY 2027, IS GOING TO BOOM WITH RAPIDFIRE INC., PLAYWIRE MEDIA LLC, ATLAS ALPHA INC., ENGAGE.' Available at: <http://ipsnews.net/business/2021/10/04/in-game-advertising-market-to-reach-usd-18-41-billion-by-2027-is-going-to-boom-with-rapidfire-inc-playwire-media-llc-atlas-alpha-inc-engage/>. Accessed January 2022.
- ¹⁸ J.P. Morgan, 'Payments & Cross-Currency Solutions.' Available at: <https://www.jpmorgan.com/solutions/treasury-payments/payments-and-cross-currency-solutions>. Accessed February 2022.

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