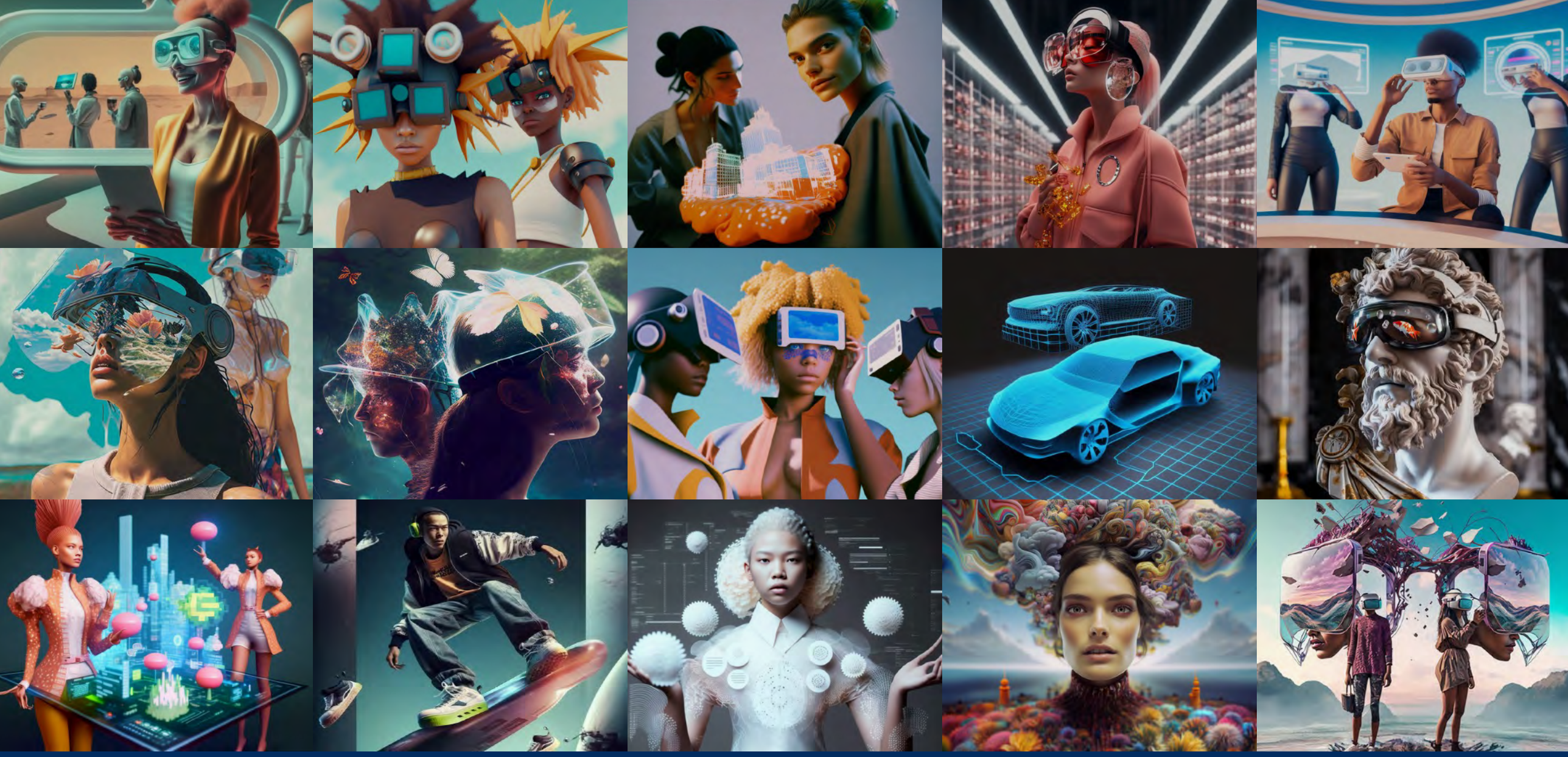

ARTWORK GENERATED BY AI

BEYOND THE HYPE CYCLE: THE METAVERSE MATTERS NOW MORE THAN EVER

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Enabled by Generative AI, the Metaverse is closer to realization then ever; we expect that there will be over 600M Metaverse users by 2026

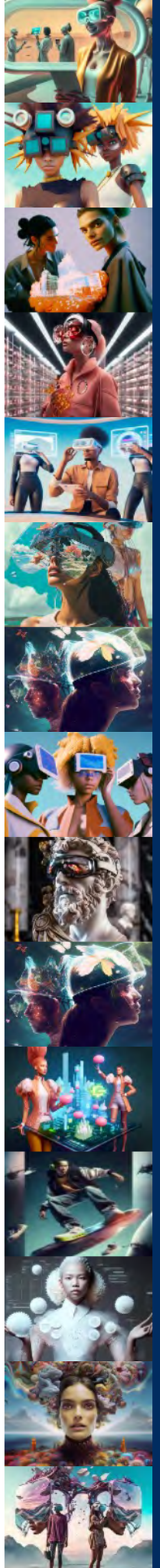
- **Generative AI will accelerate the development of the Metaverse,** enabling faster creation and scaling of virtual worlds, lowering barriers for entry and creation for all users, and allowing for a broad set of immersive social interactions

- **The Metaverse is already here in video games:** virtual worlds, users at scale, social interactions, and sophisticated user creation already exist today inside of video games

- **Today, there are already 300M+ active users in Metaverse video games and virtual world platforms;** with Generative AI as the enabler, we forecast that there will be over 600M people in the Metaverse within three years

- **The line between physical and virtual experiences is blurring;** most digital behaviors and daily activities are already taking place inside of Metaverse video games and virtual world platforms – this is just the beginning

- **Now that the Metaverse is beyond its peak hype cycle, companies will need to create practical and future-proofed Metaverse strategies,** prioritizing investments in the context of their companies' broader consumer engagement and technology development agendas



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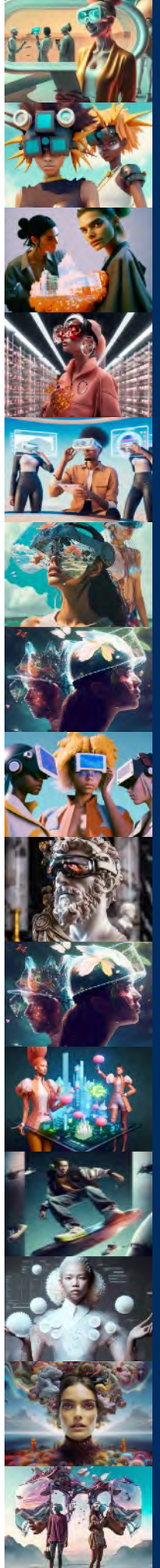
METAVERSE:
TIME FOR PRACTICAL APPLICATIONS



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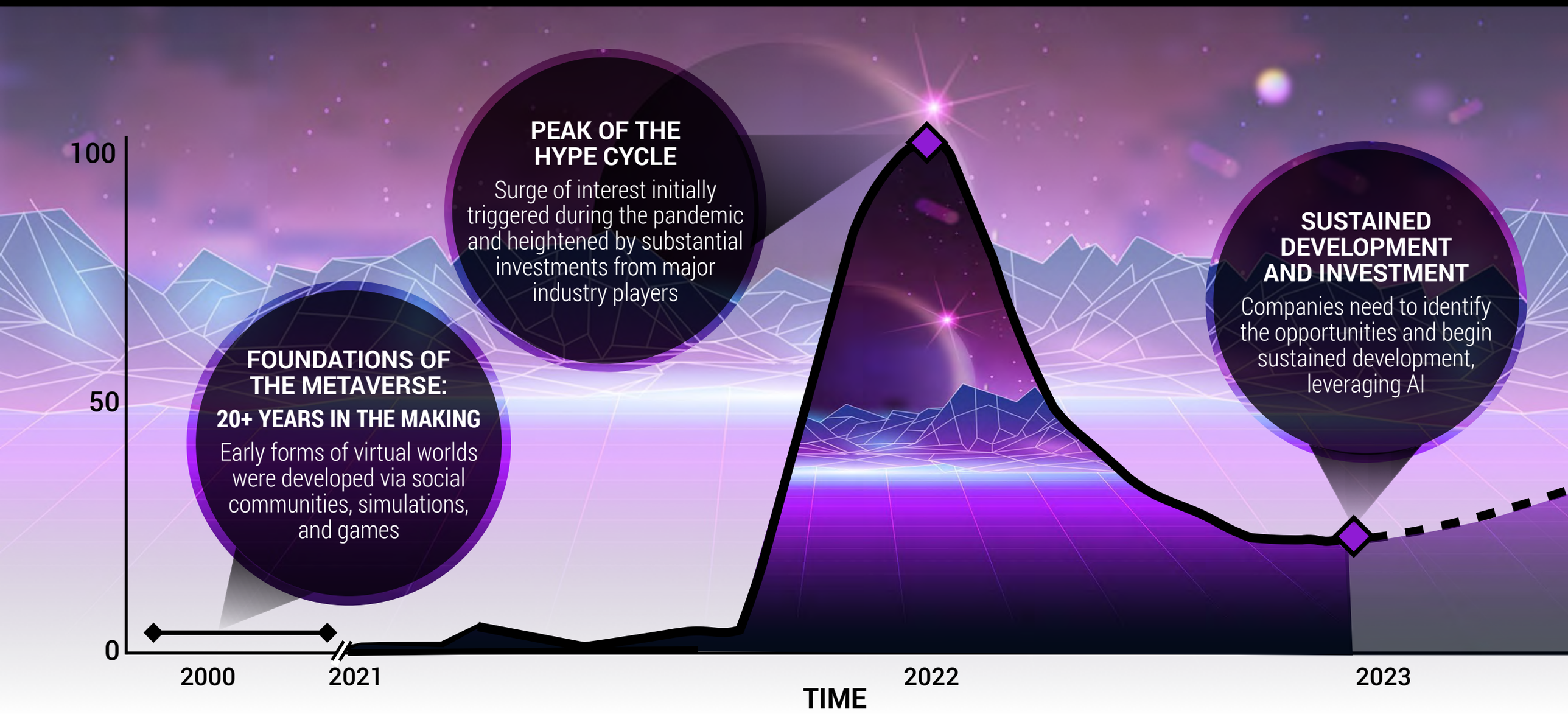
The Metaverse is beyond its peak hype cycle; we are at an inflection point where AI will accelerate its realization, and companies will need to begin sustained development and investment

GOOGLE SEARCH INTEREST[1] IN THE METAVERSE, U.S., JAN. 2021-JAN. 2023, INDEXED TO PEAK INTEREST



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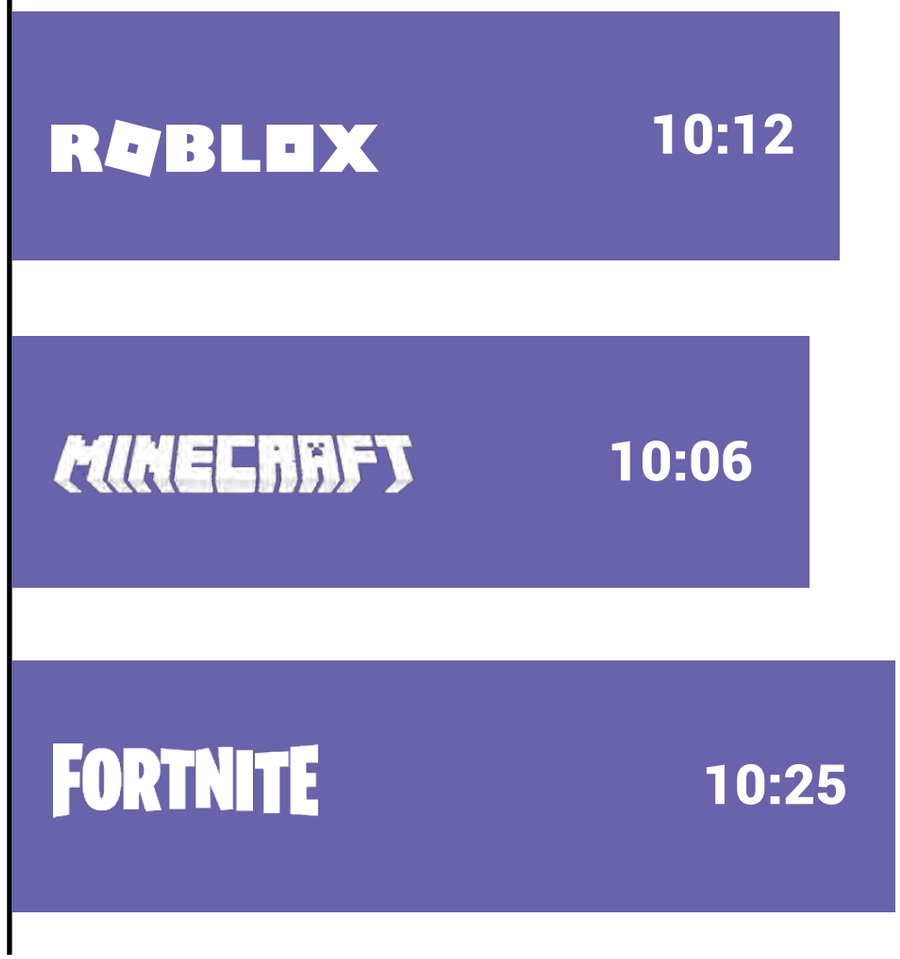
1. Google Trends captures interest in a topic on a scale of 1-100 over time, with 100 representing the peak interest.
Sources: Activate analysis, Google Trends

Today, there are already 300M+ people globally spending significant time in major Metaverse video games and virtual world platforms; enabled by Generative AI, this will be 600M people worldwide by 2026

MONTHLY ACTIVE USERS OF SELECT METAVERSE GAMES, GLOBAL, 2023, MILLIONS

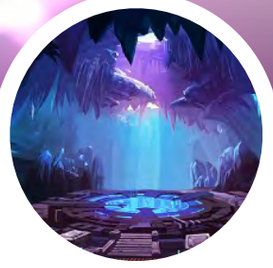
AVERAGE TIME SPENT PER MONTH PER MAU BY METAVERSE GAME, SELECT COUNTRIES[5], 2022, HOURS:MINUTES



1. Feb. 2023 estimate. 2. Jan. 2023 estimate. 3. As of Mar. 2023. 4. Includes MAUs for all Blizzard Entertainment games as of Feb. 2023. Users predominantly in China, Japan, and South Korea. 5. Includes France, Germany, U.K., and U.S.
Sources: Activate analysis, Company filings, Company press releases, Newzoo, RTrack, Yahoo

The Metaverse is already here in video games: virtual worlds, expansive user bases, social interactions, and user agency/creation largely exist inside of video games today and will provide the foundation for the future

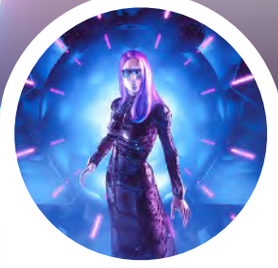
VIDEO GAMES ARE THE FOUNDATION OF AN EXPANSIVE METAVERSE WORLD



Video games already offer connected immersive experiences at scale

Consumers are participating in non-gaming activities and demonstrating social behaviors inside of video games

User creation, co-creation, and building are established behaviors
(e.g. user-generated activities, games, experiences, virtual goods, environments)



Players control their identity and can customize a digital persona distinct from their real-world identity

Digital twins exist as mirrors of the real world
(e.g. virtual representations of real-world spaces/ objects)

Games provide established IP and relatable contexts and characters as hooks for users

Technology, game engines, and platforms are already in wide use
(e.g. game mechanics, concurrency, social, AR/VR integration, security, identity, content moderation)

Consumers participate in large-scale, established global economies
(e.g. digital goods/ services, eCommerce activities, brand/ product placement)

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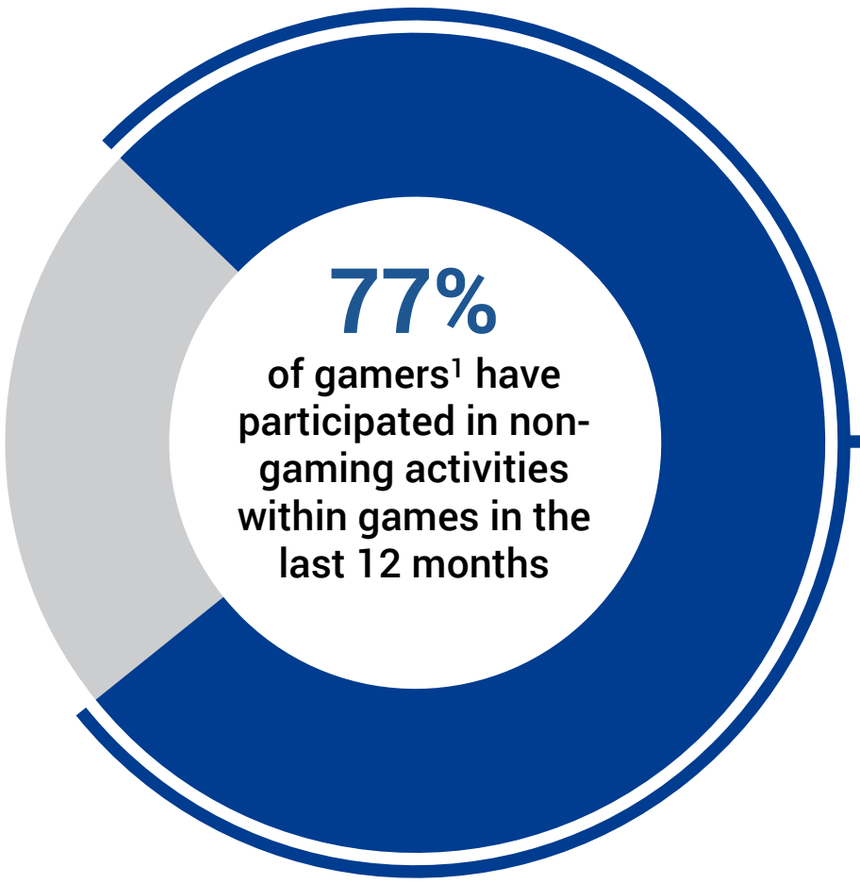
Source: Activate analysis

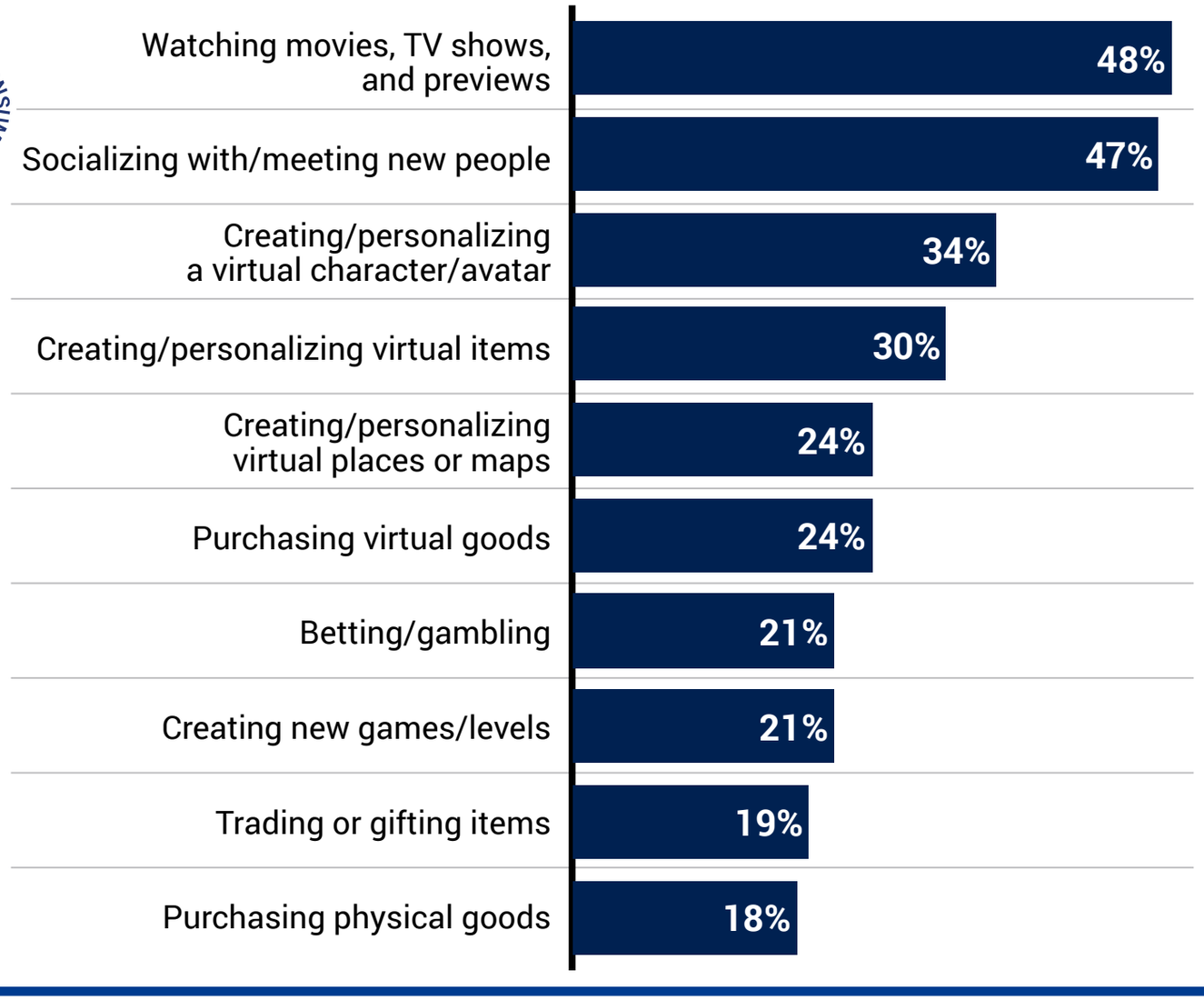
Our research shows that the majority of gamers already participate in non-gaming, Metaverse activities inside of video games

PARTICIPATION IN NON-GAMING ACTIVITIES OR EVENTS WITHIN VIDEO GAMES IN THE LAST 12 MONTHS, U.S., 2022, % GAMERS[1]

100% = 148M U.S. Gamers[1]



DETAILED PARTICIPATION IN NON-GAMING ACTIVITIES OR EVENTS WITHIN VIDEO GAMES IN THE LAST 12 MONTHS, U.S., 2022, % GAMERS[1]



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1. Adults aged 18+ who currently play video games.
Sources: Activate analysis, Activate 2022 Consumer Technology & Media Research Study (n = 4,001), Activate 2022 Metaverse & NFT Consumer Research Study (n = 3,078), U.S. Census Bureau

Most digital behaviors and many daily activities will happen in Metaverse platforms; many of these are already taking place in virtual worlds and video games

SOCIAL

- Communication
- Social Networks
- Fitness and Health
- Messaging
- Dating/ Relationships
- Shopping and Marketplaces
- Sex
- NFTs and Other Digital Goods
- Real Estate and Land Ownership

ENTERPRISE

- Workplace and Productivity
- Browsing
- Search
- Events/ Performances/ Exhibits
- Learning
- Experience and Content Creation

ECONOMIES

- Advertising/ Sponsorships/ Partnerships
- Trading and Finance
- Payments and Currency

MEDIA EXPERIENCES

- Gambling
- News
- Sports
- Video
- Music
- Video Games

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Source: Activate analysis

The foundation for the Metaverse has been in development for the last 20 years through video games, virtual experiences, and technologies; going forward, we will see the emergence of practical consumer and enterprise applications enabled by AI

METAVERSE EVENTS/PLATFORMS

★ = virtual world platforms

2000-2005
- The Sims ★
- Second Life ★
- World of Warcraft ★
- facebook
- XBOX 360

2006-2010
- Roblox ★
- App Store
- Google Play [1]
- bitcoin

2011-2016
- Minecraft ★
- Microsoft acquires Minecraft
- Pokémon GO
- twitch
- First NFTs

2017-2018
- Fortnite ★
- PUBG ★
- ARKit
- ARCore
- CryptoPunks [2]
- ethereum
- Discord
- Lens Studio [3]
- OpenSea

2019
- Axie Infinity ★
- Decentraland ★
- Upland ★
- Marshmello Fortnite concert [5]
- 5G
- oculus quest
- Arcade
- UBISOFT+ [4]

2020
- Travis Scott Fortnite concert [5]
- Animal Crossing
- NVIDIA Omniverse
- Top Shot [6]
- Xbox Series X
- PS5
- Meta Quest 2 [7]

2021
- horizon Worlds ★
- Disney patents technology metaverse theme park
- Roblox IPO
- facebook changes name to Meta

2022
- Microsoft Mesh [8] ★
- Coachella coachellaverse
- Epic Games raises $2B to fund metaverse expansion
- Post Malone Horizon Worlds concert [5]
- Microsoft announces intent to acquire Activision Blizzard
- Unreal Engine [9]
- OpenAI ChatGPT
- Meta Quest Pro

Beyond
- Emergence of practical applications (consumer & enterprise)
- OpenAI
- Midjourney
- DALL·E 2
- Roblox AI
- Nvidia ACE
- Convai
- Apple Vision Pro
- 6G [10]
- PlayStation VR2 [11]
- Sony Mocopi [12]
- unity Metacast [13]

TECHNOLOGY INNOVATIONS

Note: Not exhaustive. 1. Previously Android Market. Rebranded to Google Play in Mar. 2012. 2. CryptoPunks is an early NFT project developed on the Ethereum blockchain. 3. Lens Studio is Snap's AR platform available on mobile devices. 4. Previously Uplay+, Ubisoft+ is a game subscription service that allows access to 100+ games. 5. Not exhaustive. Other Metaverse concerts include but are not limited to Ariana Grande in Fortnite, Charli XCX in Roblox, BLACKPINK in PUBG, and BTS in Minecraft. 6. Top Shot is a collection of NFTs that showcase memorable NBA moments. 7. Rebranded from Oculus Quest 2. 8. Microsoft Mesh became available for limited preview in Mar. 2022. Initially announced in Mar. 2021. 9. Unreal Engine 5 released in 2022. Unreal Engine originally released in 1998. 10. 6G projected in the coming years. 11. PlayStation VR2 launched in Feb. 2023. 12. Sony Mocopi wearables launched in Japan in Jan. 2023. 13. Unity Metacast to offer interactive 3D sports experiences.
Sources: Activate analysis, Company press releases, Company sites

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METAVERSE: TIME FOR PRACTICAL APPLICATIONS

THE METAVERSE MATTERS NOW

» AI'S IMPACT ON THE METAVERSE

ELEMENTS OF THE METAVERSE

METAVERSE ECOSYSTEM

PRACTICAL PLAYBOOK FOR THE METAVERSE

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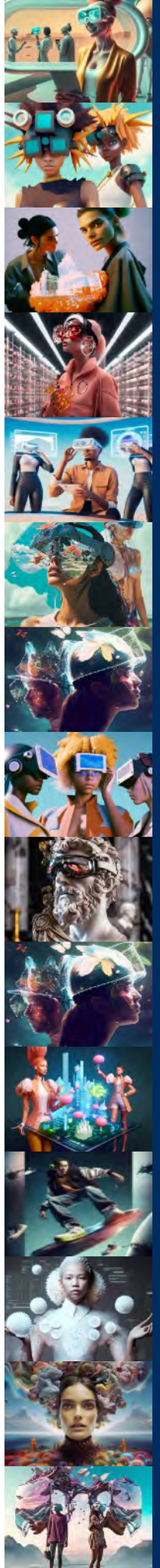

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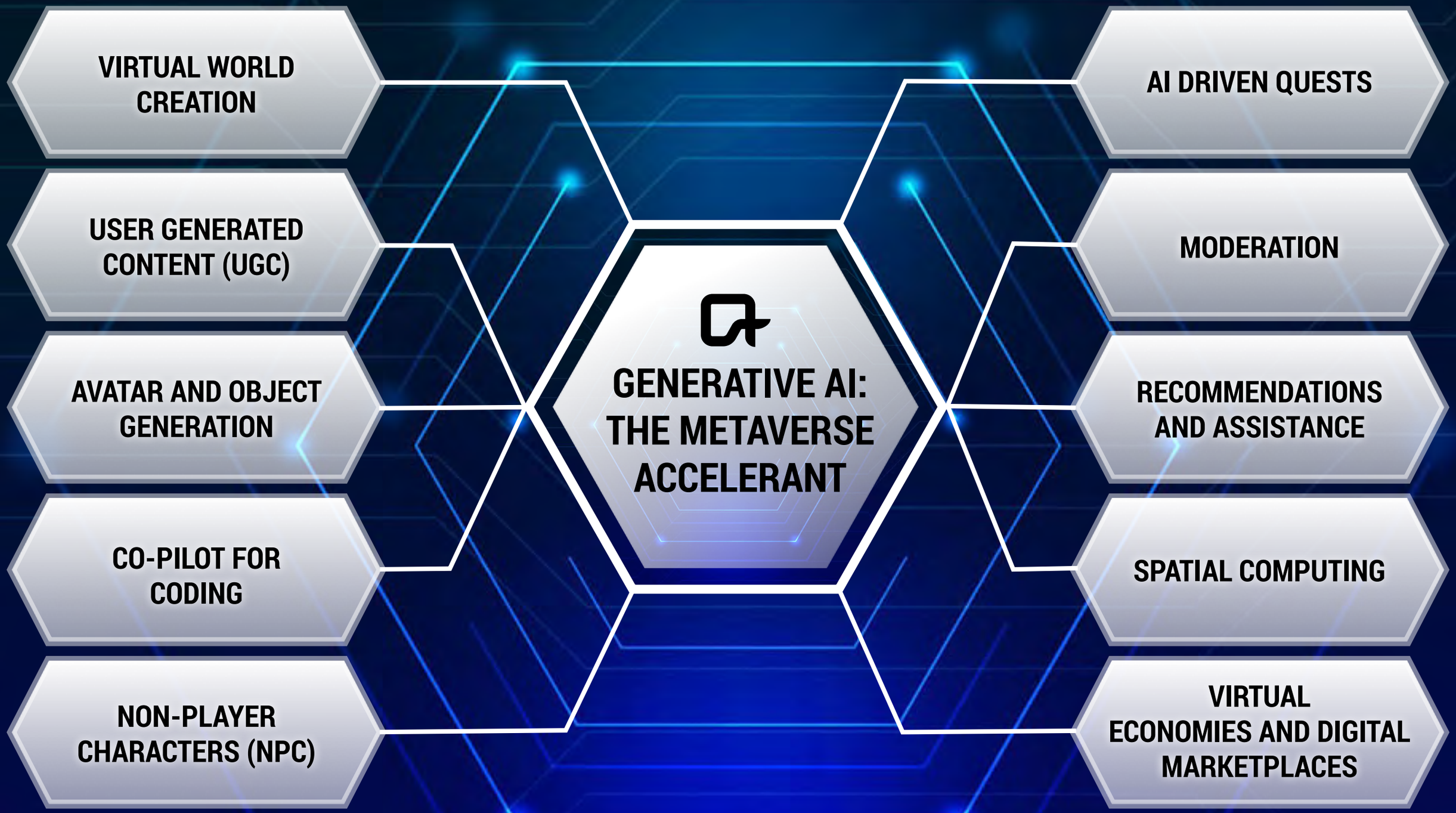
AI will accelerate the development of the Metaverse

Source: Activate analysis

Generative AI will accelerate the realization of the Metaverse



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Source: Activate analysis

Generative AI's impact on the development of the Metaverse (1 of 2)

VIRTUAL WORLD CREATION: Allows the Metaverse to scale significantly faster through automatic, algorithm-based creation of virtual settings (e.g. cities, landscapes, terrain, textures, vegetation, etc.), generating a virtually infinite universe, creating billions of digital assets (text and code, audio, images, assets, and worlds) which would be impossible to do manually

USER GENERATED CONTENT (UGC): Enables every user to become a developer and creator, making user agency and creation practical today; significantly decreases the technical skill required (similar to short-form democratized video), empowering millions of people to build, play, share, and monetize their own interactive experiences

AVATAR AND OBJECT GENERATION: Enables users to express their personalities via avatars that can be created and customized beyond the limits of their imagination; virtual avatars and digital characters are highly realistic and expressive

CO-PILOT FOR CODING: Helps users today who are familiar with coding, offering autocomplete-style suggestions as they code; down the road, it will be designed for creative newcomers and those with no practical coding experience

NON-PLAYER CHARACTERS (NPC): Creates virtual characters that are believable and can interact with users naturally; generates dialogue for NPCs, allowing for more realistic and organic engagement

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Source: Activate analysis

Generative AI's impact on the development of the Metaverse (2 of 2)

AI DRIVEN QUESTS: Creates an ever-evolving experience of unique storylines, settings, and character interactions that adapt to the preferences and needs of users

MODERATION: Provides the ability for users to determine what a "safe space" means for them and to implement those controls to create an experience that limits exposure to ill-intentioned actors

RECOMMENDATIONS AND ASSISTANCE: Enables the creation of virtual assistants, chatbots, and digital guides, providing users with personalized recommendations and assistance within the Metaverse; enhances the overall Metaverse experience, making it more intuitive, accessible, and tailored to a user's interests, and provides users with feedback on their creations and suggestions for improvements

SPATIAL COMPUTING: Enables the real-time integration of the physical world with digital information and interactions, which manifests in tailored immersive experiences delivered through augmented reality, mixed reality or virtual reality

VIRTUAL ECONOMIES AND DIGITAL MARKETPLACES: Generates virtual goods and services, allowing businesses and people to create new revenue streams within the Metaverse

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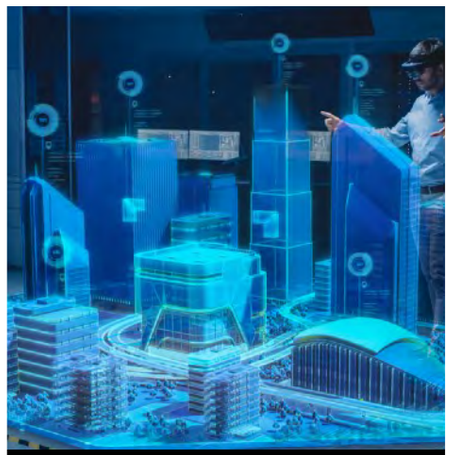
Source: Activate analysis

Generative AI will make all users and companies into developers, with the power to create professional-level graphics and experiences via plain language text and image inputs, requiring little to no coding skills

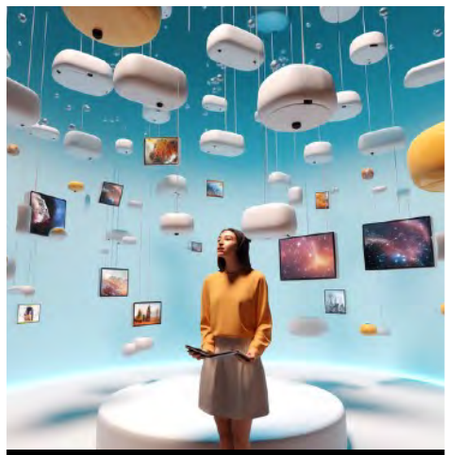
GENERATIVE AI METAVERSE USE-CASES



CREATE INSTANT LANDSCAPES TO SCALE METAVERSE WORLDS

CUSTOMIZE AVATARS TO SPECIFICATIONS OF USERS

POWER SOPHISTICATED, HYPER-REALISTIC NPCS



GENERATE ONE-OF-A-KIND ART PIECES

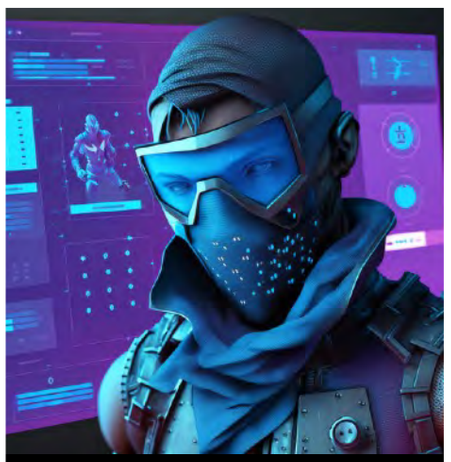
DESIGN ENGAGING EDUCATION AND TRAINING PROGRAMS

CRAFT ADAPTABLE USER-SPECIFIC STORYLINES

PRODUCE UNIQUE AUDIO TRACKS IN REAL-TIME

BUILD REPLICAS OF THE 3D PHYSICAL WORLD

DELIVER VIRTUAL SERVICES



CREATE CUSTOM PERSONALITIES AND BIOGRAPHIES

Source: Activate analysis

Generative AI tools significantly lower the entry barrier for user agency across the full set of creator use cases

ILLUSTRATIVE GENERATIVE AI COMPANIES & TOOLS

AI DUNGEON	• A free-to-play single-player and multiplayer text adventure game which uses artificial intelligence to generate content (launched Dec. 2019)
CHAT GPT OpenAI	• AI chatbot that responds to users' queries with detailed, comprehensive and human-like text answers (launched Nov. 2022)
CODEX OpenAI	• AI system that translates natural language to code (launched Aug. 2021)
INSTANT neRF NVIDIA	• AI software that takes 2D reference images and rapidly creates 3D models of objects/spaces (launched Spring 2022)
Midjourney	• AI service created by a San Francisco-based independent research lab, which generates images from natural language descriptions prompts (launched Mar. 2022)
MUSE	• Deep learning text-to-image model, focused on greatly minimizing image generation time (announced Jan. 2023)
SOUNDRAW	• AI tool that generates music matching the user's content preferences (launched Winter 2020)
SPLINE	• AI tool that generates objects, animations, and textures using text prompts (launched Winter 2020)
stability.ai	• AI model that allows users to generate hyper-specific images from any line of text (launched Nov. 2022)

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Sources: Activate analysis, Company sites

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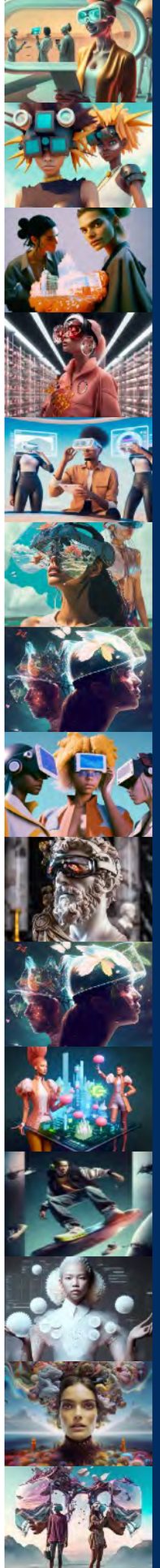

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We see nine foundational elements of the Metaverse; proof points for each of these elements already exist today

SOCIAL INTERACTIONS

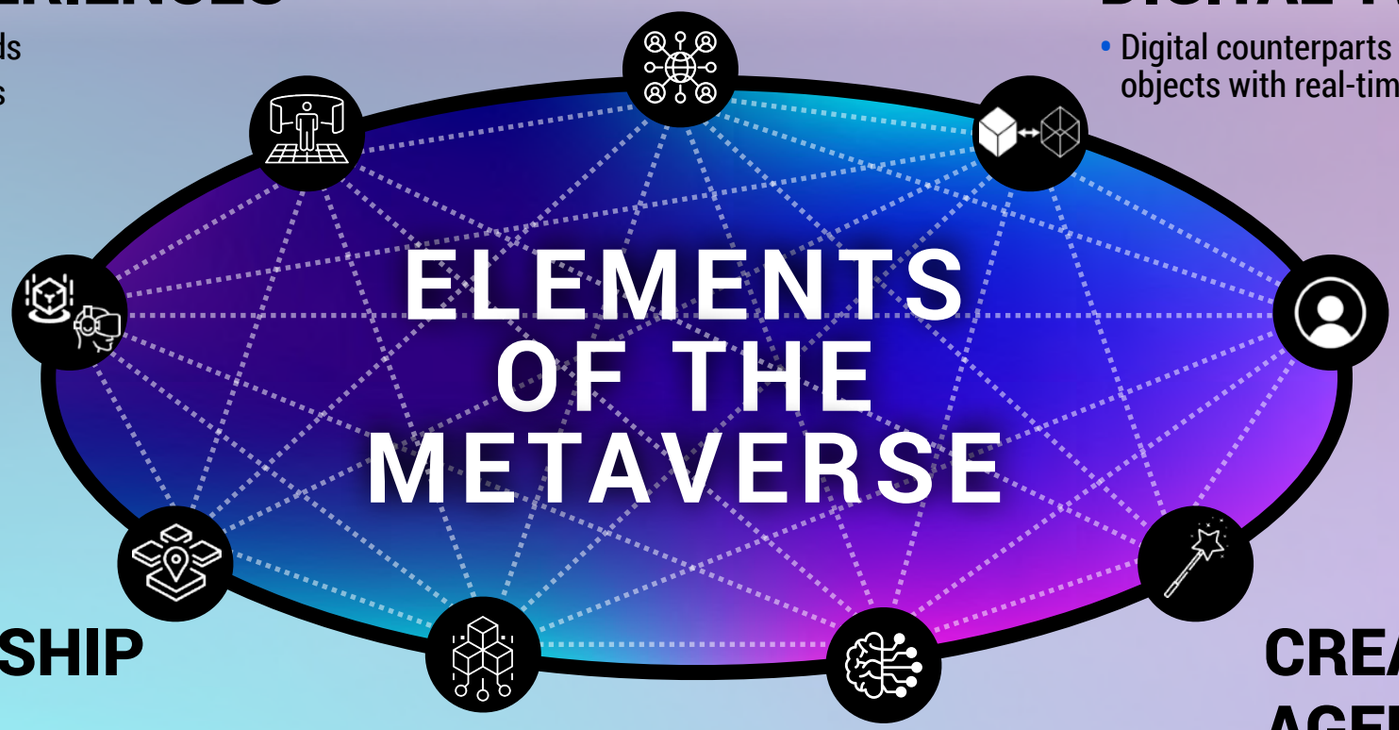
- Immersive social communities and experiences
- Enterprise collaboration/distributed work

IMMERSIVE EXPERIENCES

- Interactive gameplay in virtual worlds
- Presence in simulated environments

DIGITAL TWINS

- Digital counterparts to physical spaces/ objects with real-time synchronization



SPATIAL COMPUTING

- Interactive digital overlays in physical spaces
- Persistent digital content anchored to real-world locations

IDENTITY

- Personalized avatars enabling self-expression
- Persistent identity

VIRTUAL OWNERSHIP

- Virtual goods ownership and usage
- Authenticated ownership of digital/physical assets

ECONOMY

- Marketplaces
- Branding and advertising

GENERATIVE AI

- Accelerant for developers
- User defined experiences and creation

CREATION AND AGENCY

- In-game experience creation
- Design and development tools

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Source: Activate analysis

Virtual world video games already include most of the nine foundational Metaverse elements

SELECT VIRTUAL WORLD GAMES AND METAVERSE ELEMENTS

✔ FEATURE/CAPABILITY AVAILABLE

METAVERSE ELEMENTS	MAJOR VIRTUAL WORLD GAMES				
	FORTNITE	ROBLOX	MINECRAFT	WORLD OF WARCRAFT	SECOND LIFE
IMMERSIVE EXPERIENCES	✔	✔	✔	✔	✔
SOCIAL INTERACTIONS	✔	✔	✔	✔	✔
DIGITAL TWINS	✔	✔	✔		✔
IDENTITY	✔	✔	✔	✔	✔
CREATION AND AGENCY	✔	✔	✔	✔	✔
GENERATIVE AI		✔			
ECONOMY	✔	✔	✔	✔	✔
VIRTUAL OWNERSHIP	✔	✔	✔	✔	✔
SPATIAL COMPUTING		✔	✔		

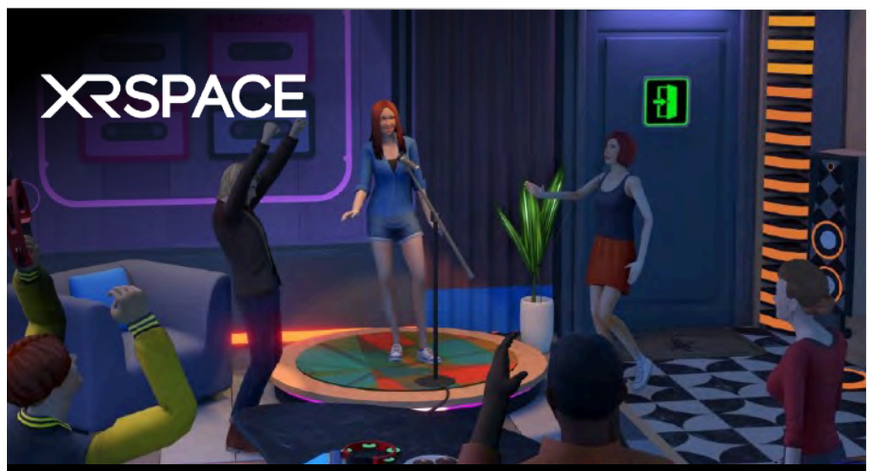
Note: Includes early-stage indicators for Metaverse applications (e.g. ability to create environments that mirror the real world, ability to create personalized avatars, ability to purchase virtual goods). Information as of April 2023.
Sources: Activate analysis, Company sites

Shared immersive experiences will be the foundation for Metaverse platforms

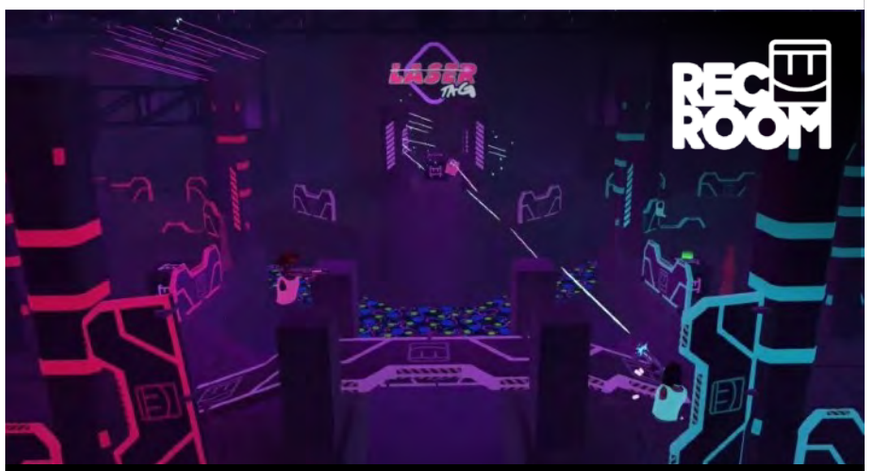
EXAMPLES OF IMMERSIVE EXPERIENCES WITHIN THE METAVERSE

EXPLORE WORLD OF WARCRAFT'S OPEN-GAME WORLD, COMPLETE QUESTS, AND INTERACT WITH OTHER PLAYERS

ATTEND A LIVE VIRTUAL MUSIC PERFORMANCE WITH FRIENDS IN SOUNDSCAPE VR



PARTICIPATE IN A 3D VIRTUAL KARAOKE EXPERIENCE IN XRSPACE PARTYON



BATTLE OTHER USERS IN REC ROOM'S LASER TAG ARENA

ACTIVATE PERSPECTIVE

Immersive experiences in the Metaverse will:

- Grow in variety and number as the Metaverse develops
- Provide opportunities to meet people through both structured activities (e.g. sports, games, concerts) and non-structured activities (e.g. open space exploration)
- Increasingly replicate real-life activities and experiences as Metaverse participation becomes a more mainstream behavior
- Evolve in complexity, detail, and functionality to offer virtual experiences with greater similarity to physical world activities

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Sources: Activate analysis, Company sites

Social experiences and interactions will increasingly take place in Metaverse platforms

EXAMPLES OF SOCIAL AND COMMUNITY-BASED INTERACTION WITHIN THE METAVERSE

SPEND TIME WITH FRIENDS IN FORTNITE'S PARTY WORLDS

PARTY WITH PARIS HILTON AT CRYPTOWEEN IN ROBLOX AND THE SANDBOX

PLAY GAMES OF PICKUP BASKETBALL IN NBA 2K22 "THE NEIGHBORHOOD"

CELEBRATE A VIRTUAL WEDDING IN ANIMAL CROSSING

ACTIVATE PERSPECTIVE

Social and community-based interactions in the Metaverse will:

- Include the ability to engage with real-life friends and meet new people in virtual worlds (e.g. open spaces, events, meetings)
- Enhance activities with live user-to-user interaction (e.g. virtual gameplay)
- Develop additional applications as more activities become available (e.g. dating, attending festivals, professional networking)
- Supplement or even replace an increasing number of real-world social events over time (e.g. parties, weddings, sports games)

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Sources: Activate analysis, Company sites

Metaverse workplace collaboration platforms will provide a more immersive vehicle for virtual interaction and an expansion of video conferencing technologies

EXAMPLES OF EARLY METAVERSE WORKPLACE COLLABORATION

DEVELOP AND SHARE IDEAS REMOTELY IN CUSTOMIZED, FLEXIBLE ROOMS WITH HORIZON WORKROOMS

BUILD IMMERSIVE WORKSPACES TO GATHER WITH COWORKERS AND ATTEND MEETINGS WITH MESH FOR TEAMS

HOST A VIRTUAL CONFERENCE, EXHIBITION, OR CORPORATE GATHERING WITH MOOTUP

CONNECT WITH OTHER PROFESSIONALS, VISIT COMPANY HUBS, AND ATTEND EVENTS WITH ENGAGE LINK

ACTIVATE PERSPECTIVE

Collaboration in the Metaverse will:

- Enable deeper levels of immersion over time
- Leverage avatars to create a sense of presence and provide users with agency over their own representation
- Include a broadening set of tools and resources to facilitate immersive collaboration (e.g. virtual conference rooms, shared whiteboards, spatial audio)
- Allow users to collaborate directly on files/projects as if in person together (e.g. object manipulation, 3D physical objects, interoperability of files across platforms)

Sources: Activate analysis, Company sites

The Metaverse has a broad set of enterprise applications, including digital twins of objects and environments

What is it?

A digital twin is a real-time virtual representation of a real-world physical system that serves as the indistinguishable digital counterpart.

Digital twins are made to:

- Monitor performance
- Test different scenarios
- Predict issues
- Find optimization opportunities

How is it built?

Building a digital twin requires the creation of:

- Hardware to initiate the exchange of information between assets and their software representation (e.g. physical sensors, routers)
- Middleware to accumulate data from different sources in a centralized repository
- Software to turn raw observations into valuable business insights (e.g. machine learning tools, simulation software)

These components allow constant communication between the physical and digital items.

Who is enabling it?

Example companies enabling this technology:

Azure
IBM
NVIDIA
unity
UNREAL ENGINE

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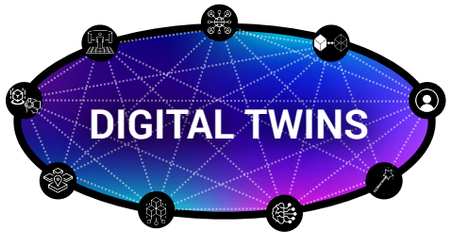
Sources: Activate analysis, Company sites

Enterprises and SMBs are accessing the tools to build digital twins



EXAMPLES OF DIGITAL TWINS WITH ENTERPRISE AND SMB USE CASES

AZURE DIGITAL TWINS:

Allows users **to create digital models** of buildings, factories, energy networks, railways, cities, and more

NVIDIA OMNIVERSE DIGITAL TWINS:

Enables users **to develop physically accurate, AI-enabled virtual simulations of real-world environments; individual creators and developers** can download, use, and contribute to NVIDIA Omniverse for free

GE DIGITAL TWIN SOFTWARE:

Allows users **to create digital twins that represent an individual asset, an integrated system of assets, or a fleet of assets**

ACTIVATE PERSPECTIVE

Digital twins in the Metaverse will:

- Be applied to a greater set of enterprise use cases and leveraged across a widening set of businesses
- Become increasingly accessible to SMBs and consumers, in addition to enterprises, as tools for building and using digital twins become more user-friendly
- Evolve to support systems with greater size and complexity as technology improves

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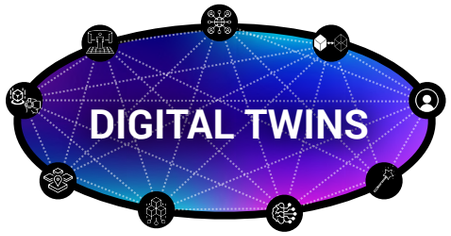
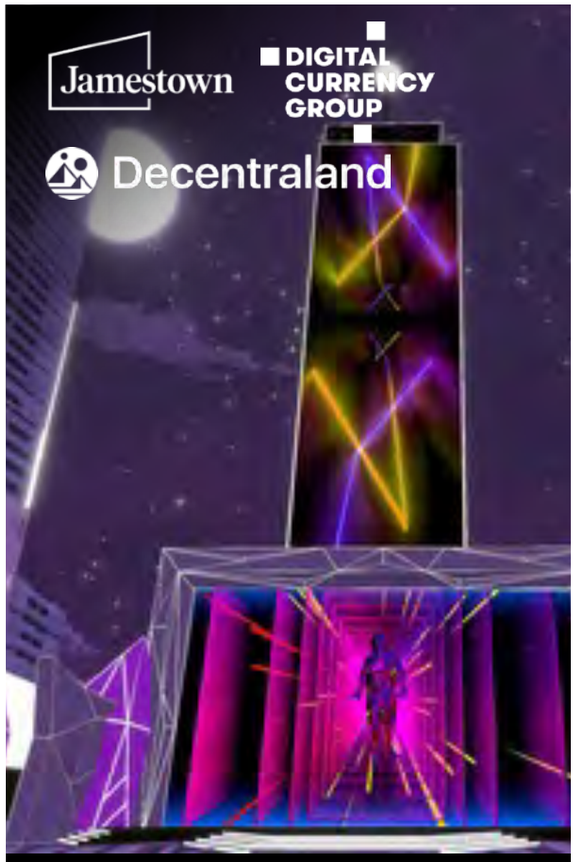
Sources: Activate analysis, Company sites

Digital twins provide a bridge between the real world and virtual worlds, with practical applications – many enabled by AI



EXAMPLES OF EARLY METAVERSE DIGITAL TWINS

BuildTheEarth is an open-contribution effort to **recreate the world at a 1:1 scale in Minecraft**



Real estate giant **Jamestown** and digital assets investor **Digital Currency Group** partnered to recreate **One Times Square in Decentraland**

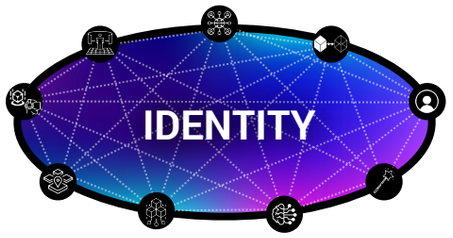
HDR, Inc. and Seattle City Light developed a digital twin model of **Diablo Dam** down to a **2cm visual accuracy** through high-res photography

ACTIVATE PERSPECTIVE

Digital twins in the Metaverse will:

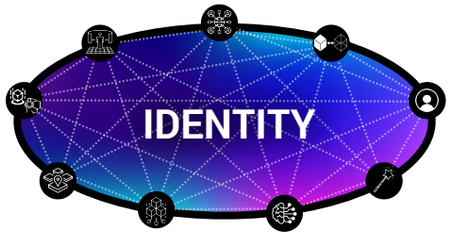
- Serve as digital replications of a growing number of real-world systems, objects, and locations
- Develop to be larger, more complex, and more synchronized with their real-world counterparts
- Incorporate a range of data types beyond visual inputs (e.g. spatial data, performance data, health data)
- Become increasingly accessible for public viewing, usage, and contribution
- Feature two-way synchronization, more closely linking the physical and digital worlds (e.g. products, changes, ownership)

Sources: Activate analysis, Company sites



People will have an expansive set of AI-enabled options to define their avatar or Metaverse identity, either as themselves today, an idealized version, or an entirely new person

Identity will be core to the Metaverse



IMPORTANCE OF IDENTITY IN THE METAVERSE

- **AI will enable** almost instant **avatar creation**
- **Personalized identities** will allow people to **reinvent themselves**, reflecting who they are and want to be
- The ability to use a **consistent identity across platforms** will serve to **unify the Metaverse** across separate systems
- Building the infrastructure and systems to **ensure security, privacy, and protections** for participants will be critical to the development of the Metaverse

READY PLAYER ME CUSTOMIZABLE AVATARS

GENIES DIGITAL 3D AVATARS

KEY ELEMENTS FOR IDENTITY IN THE FUTURE STATE OF THE METAVERSE

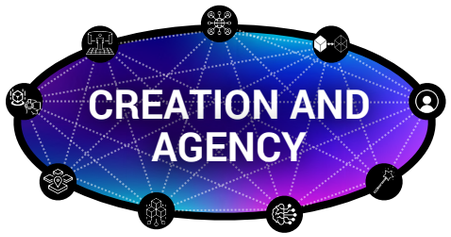
Interoperability
(i.e. use the same avatar in separate platforms and environments)

Personalization
(i.e. customize how one wants to be perceived in a virtual world through self-expression)

Authentication
(i.e. establish procedures for identify verification to ensure security and build trust between users)

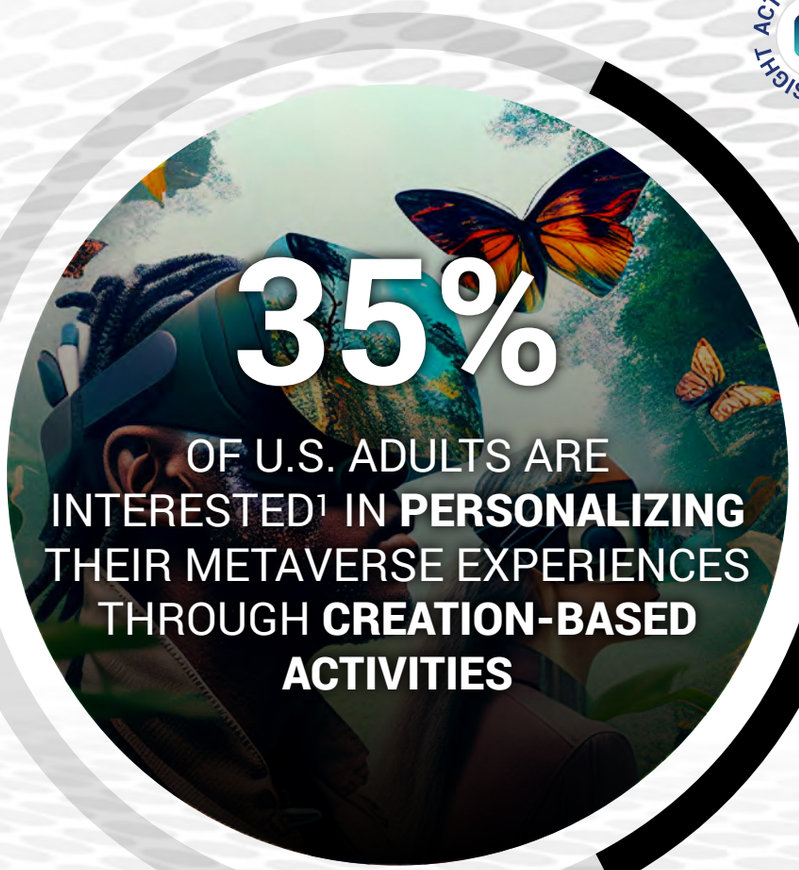
Privacy
(i.e. provide users the choice over how their personal data and digital identity are used)

Sources: Activate analysis, Company sites



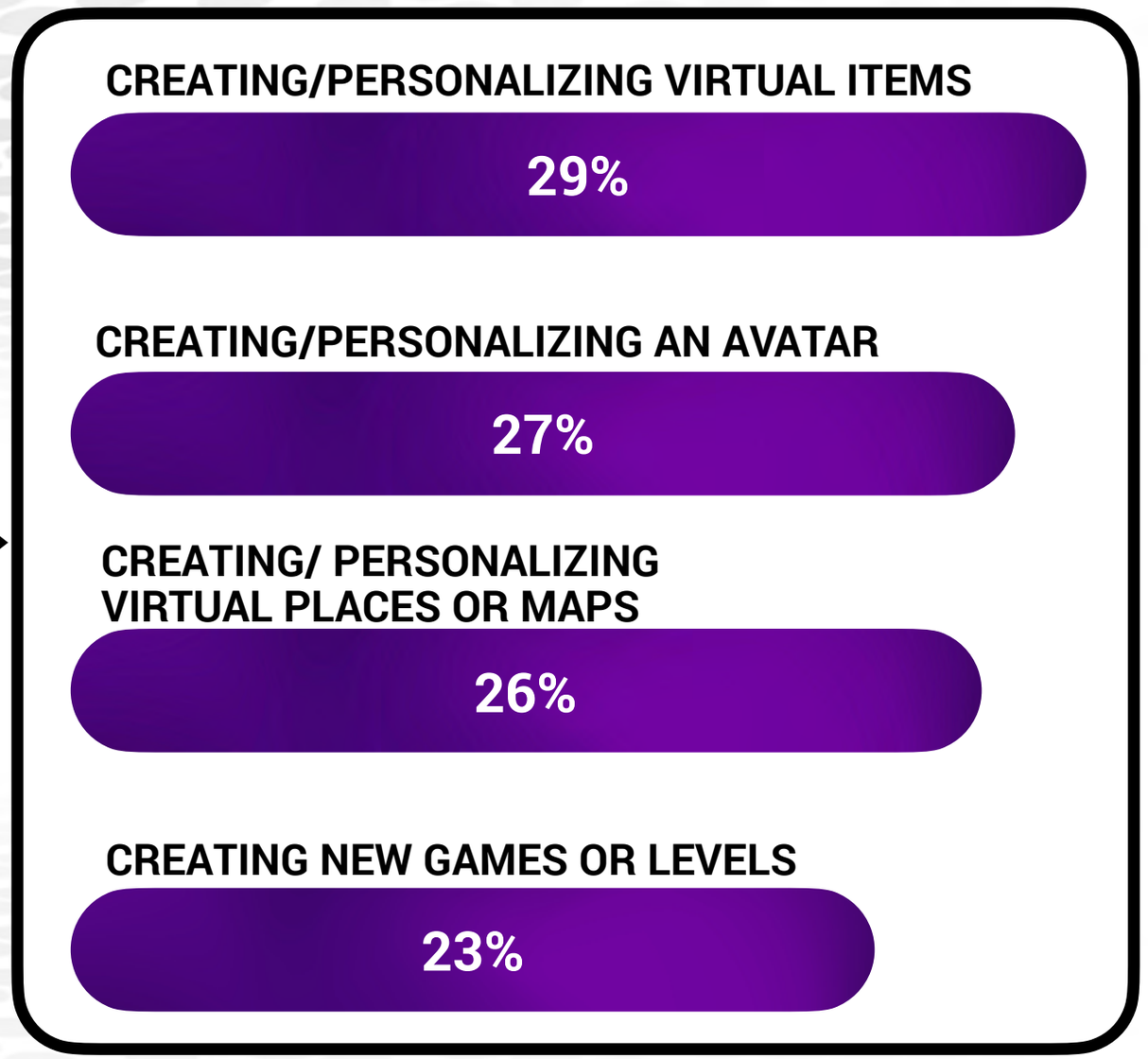
AI-enabled User creation and agency will be critical to the full development of Metaverse platforms; people will expect to create and build themselves (not just accept a world created for them)

INTEREST[1] IN FUTURE CREATION ACTIVITIES IN THE METAVERSE,
U.S., 2022, % ADULTS AGED 18+



35%

OF U.S. ADULTS ARE INTERESTED[1] IN **PERSONALIZING** THEIR METAVERSE EXPERIENCES THROUGH **CREATION-BASED ACTIVITIES**



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1. "Interested" includes consumers who are extremely or very interested in participating in the future.
Sources: Activate analysis, Activate 2022 Consumer Technology & Media Research Study (n = 4,001)

Today, user creation and agency are core to major Metaverse platforms and games

CREATION AND AGENCY

EXAMPLES OF USER-GENERATED CONTENT AND CREATOR ECONOMIES WITHIN THE METAVERSE

ROBLOX

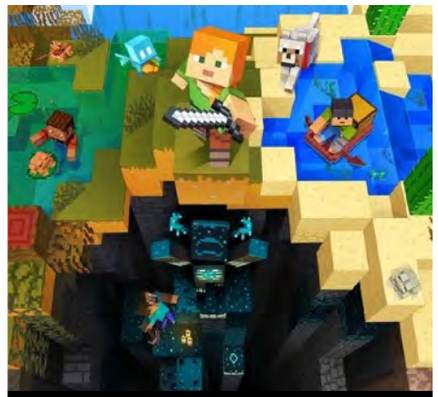
- Roblox experiences are **built almost entirely by users and developers**
- Roblox has **more than 10M developers** globally who have built **over 29M virtual experiences as of June 2022**
- In 2021, Roblox paid out over **$500M in in-game currency to developers and creators**—2,200 creators earned over $10K, and 500 creators earned over $100K

REC ROOM

- Rec Room enables users to **build, create, and play games** in rooms, with **over 12M rooms** created as of Dec. 2021
- Rec Room also offers community programs to **educate and connect creators**

FORTNITE

- Fortnite allows players to make **unique islands and games** to share with friends through its **Creative Mode**
- Fortnite also **features new games on their discovery page** to encourage **exploration of user-generated content**



MINECRAFT

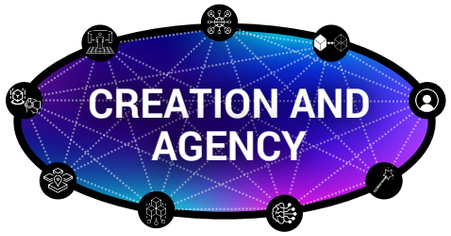
- Minecraft users can **build worlds** in Creative Mode and **develop story-based games** in Adventure Mode
- Users can **monetize creations** through the **Minecraft Marketplace** (e.g. maps, mini games, skins)

ACTIVATE PERSPECTIVE

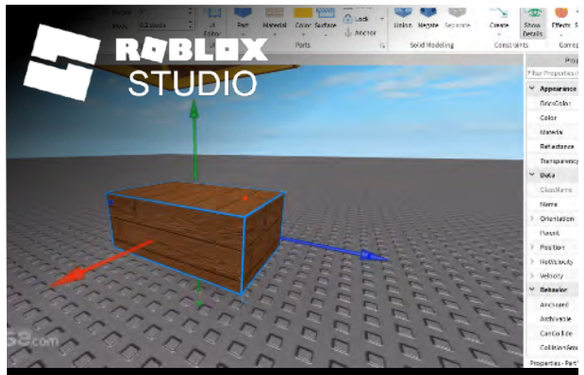
- The Metaverse will be built by both professional developers and everyday users
- User-generated creation will lead to a rapid proliferation of virtual content and Metaverse experiences
- Tools for content creation will become more intuitive, widely available, and easy to use, allowing for greater participation, creation, and sharing of unique experiences (e.g. A.I.-enhanced hyper-personalization of avatars, drag-and-drop tools for in-game creation and customization, stable diffusion to create original image and video content)
- The development of Metaverse economies, virtual ownership, and content monetization will create an ecosystem that fosters user-led creation

Sources: Activate analysis, Company filings, Company press releases, Company sites

Co-creation: Consumerization of development tools and AI enablement will fuel expanded Metaverse creation and participation

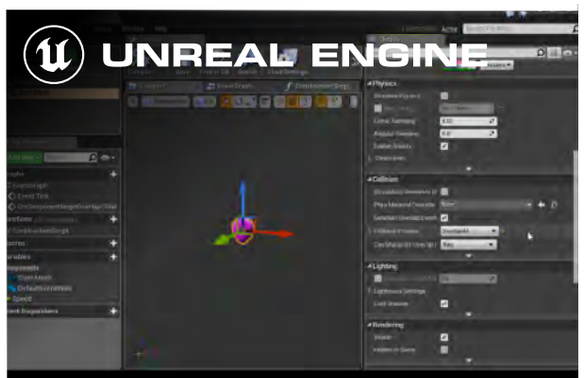


EXAMPLES OF CREATOR TOOLS WITHIN THE METAVERSE



Roblox Studio is a **free immersive creation engine** that users can access **on their own Windows or Mac devices**

Creative mode in Minecraft is **free and simple**, and enables users to **generate custom content across all platforms**



Unreal Engine is **free for all creators**, and the Blueprints Visual Scripting system **allows beginners to create game elements without writing any code**

Unity's ProBuilder is a hybrid design tool with **tutorials for beginners** and a **consumer-friendly interface**, providing **easy access to world generation and object modeling**

Adobe Substance 3D, **available on desktop and in VR with a free trial,** allows users to design and simulate 3D models

Consumers of all design backgrounds can create in Meta Horizon Worlds by leveraging **templates and tutorials** in build mode

Everyday users can leverage Microsoft Mesh's simple **menu of creative actions** to quickly build collaborative spaces for free

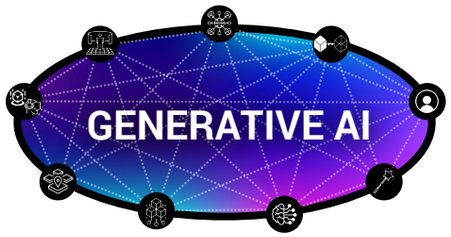
ACTIVATE PERSPECTIVE

Developer tools will evolve to include:

- Increasingly accessible versions for everyday consumers (e.g. user-friendly interfaces, project templates, free pricing)
- More complex capabilities and toolsets available to expand the possibilities of creation
- More comprehensive integration of data, analytics, and AI services to fuel creation in the Metaverse
- Ability to import content from third-party tools and other platforms, further enabling user creativity and unifying content across otherwise siloed experiences

Sources: Activate analysis, Company sites

Generative AI will be a Metaverse accelerant and critical to scaling the Metaverse



EXAMPLES OF GENERATIVE AI TOOLS THAT CAN BE APPLIED IN THE METAVERSE

With Omniverse Avatar Cloud Engine, users can build and deploy intelligent virtual assistants and digital humans at scale

DALL-E 2 users can quickly produce high-quality images from a basic prompt

Promethean AI allows video game developers to design virtual worlds to streamline creative workflows and automate mundane tasks

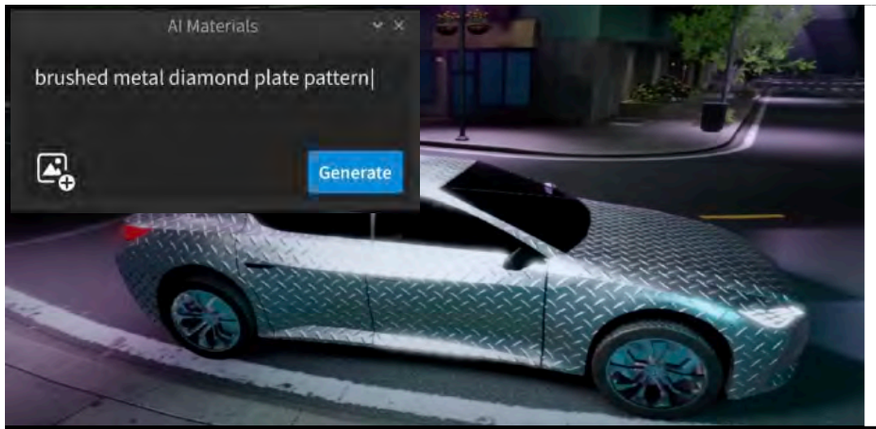
Midjourney uses natural language “prompt” descriptions to generate unique images that can be leveraged across digital platforms

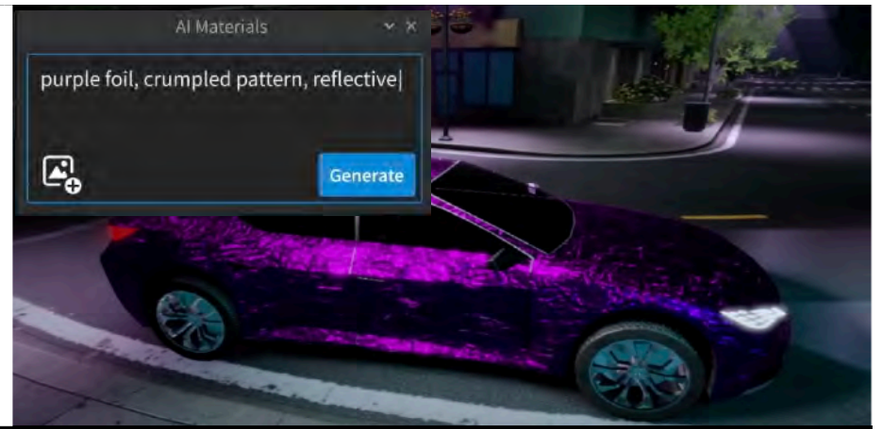
Sources: Activate analysis, Company sites

Roblox leads the way with new generative AI features to enhance and simplify the user creation process; other Metaverse platforms will soon follow

ROBLOX

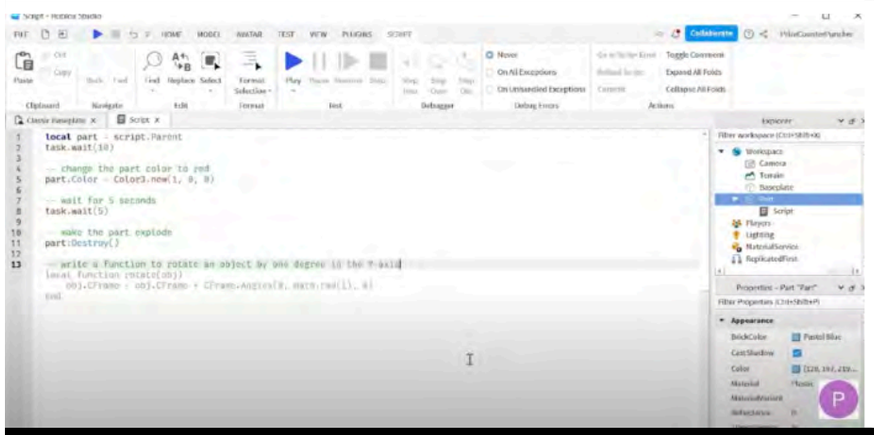
AI INTEGRATIONS

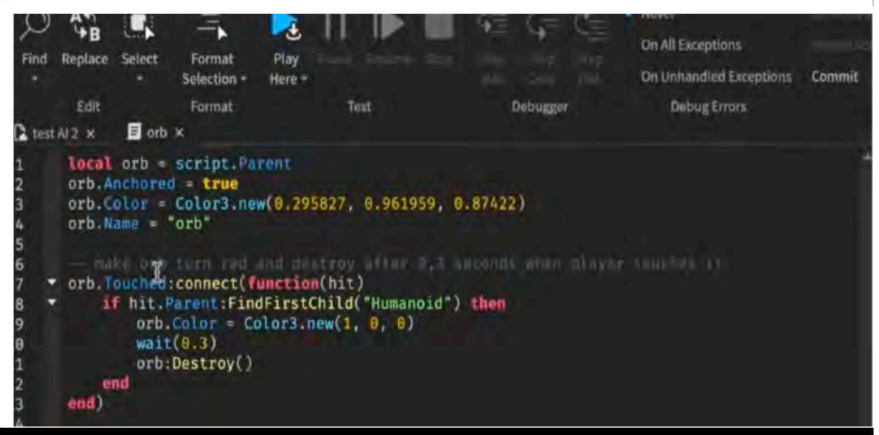




MATERIAL GENERATOR

Enhances 3D creation and UGC, as text description generates an artistic rendition which can be continually refined





CODE ASSIST

AI assistant in Roblox's Studio Script Editor that suggests lines or functions of code as users type, helping users code more efficiently

IMPACT ON ROBLOX UGC

- Significantly enhances user creation capabilities with limitless possibilities for creating custom images and objects
- Drastically increases the speed at which creators can design assets and expand virtual environments
- Removes technical requirements to code, which allows more users on the platform to become creators and to code more quickly and efficiently

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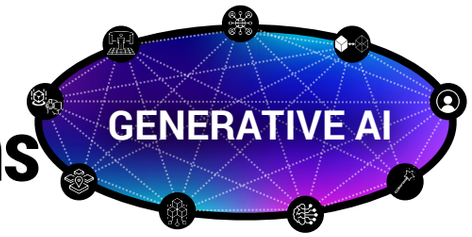
Sources: Activate analysis, Company sites



Generative AI will enable rich interactions and conversations with Non-Player Characters (NPCs), supplementing human interactions in Metaverse experiences as usage scales

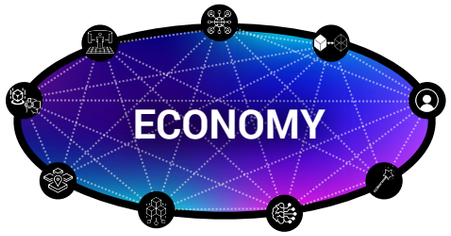
EXAMPLE OF GENERATIVE AI ENABLING RICH, INTERACTIVE EXPERIENCES WITH NON-PLAYER CHARACTERS (NPC)

ACTIVATE PERSPECTIVE

Generative AI will enable rich interactions with NPCs

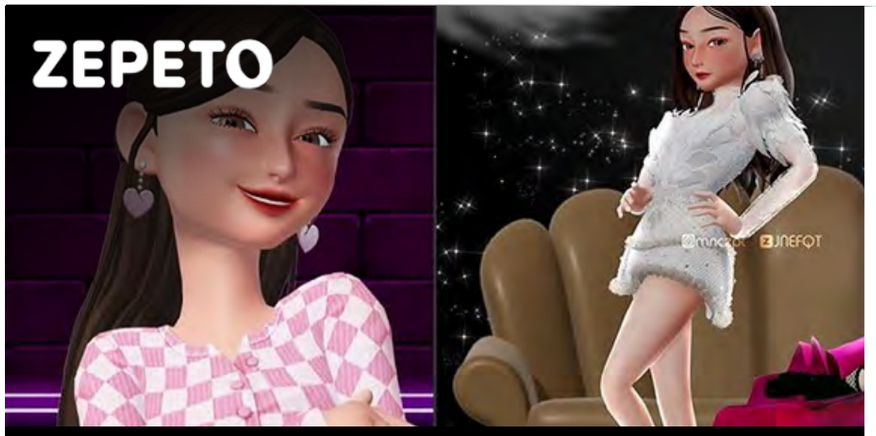
- NVIDIA provided the world a glimpse at the potential impact AI can have on gaming and Metaverse experiences with its demo at Computex 2023
- Leveraging NVIDIA's Avatar Cloud Engine (ACE), gamers can now speak naturally to non-playable characters (NPCs) and receive appropriate responses
- The technology is scaleable, and can be used to power interactions with more than one character/NPC at a time, and enable NPCs to talk to each other

Sources: NVIDIA, TheVerge, Activate Analysis



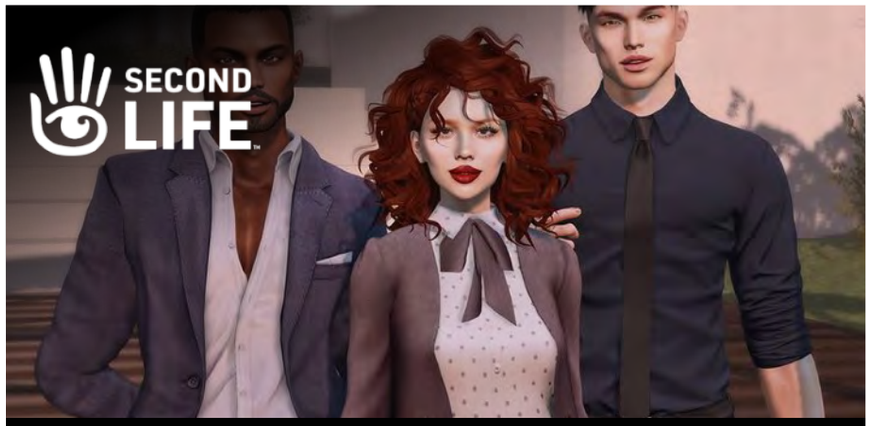
Virtual economies, created by companies and users, will become increasingly sophisticated and expansive

EXAMPLES OF VIRTUAL ECONOMIES WITHIN THE METAVERSE



Zepeto users can design and sell clothes to other users on the platform, earning a revenue share with in-game currency

In The Sandbox, users can purchase, sell, and rent land to other users, including through secondary markets (e.g. OpenSea, Rarible)



Second Life players can generate income from designing and selling goods on the platform (e.g. homes, furniture, vehicles) and can hire other players to fulfill certain roles (e.g. shop attendants, security agents, real estate agents)

In Roblox's Gucci Town, users can virtually pose for a selfie or participate in challenges/games led by Miley Cyrus' avatar, promoting Gucci Beauty's Flora Gorgeous Jasmine campaign

ACTIVATE PERSPECTIVE

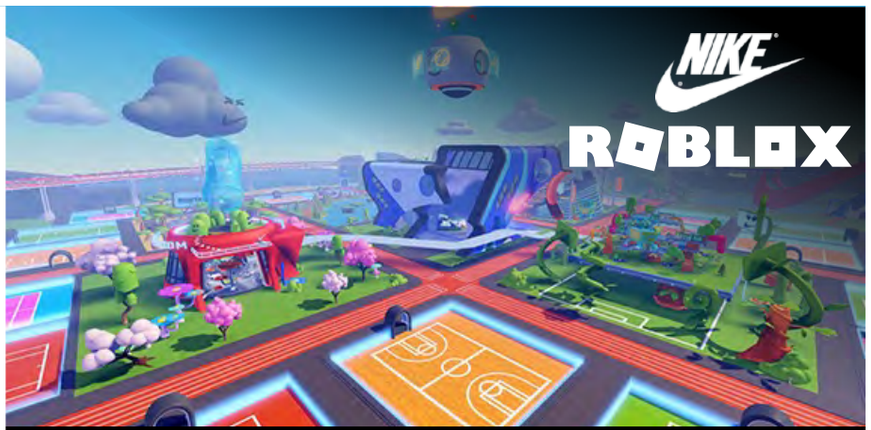
- Building blocks of the Metaverse economy will include:
  - Digital goods/services (e.g. skins for avatars, virtual fashion, virtual makeup)
  - eCommerce (e.g. shopping for physical goods in a virtual environment)
  - Advertising and brand/ product placement (e.g. showrooms, product testing, sponsored experiences)
- Brands will utilize both virtual and real-world storefronts to engage with customers
  - Digital outfits from Balenciaga, Prada, and Thom Browne are coming to Meta's soon-to-be-unveiled Avatar Store

Sources: Activate analysis, Company press releases, Company sites

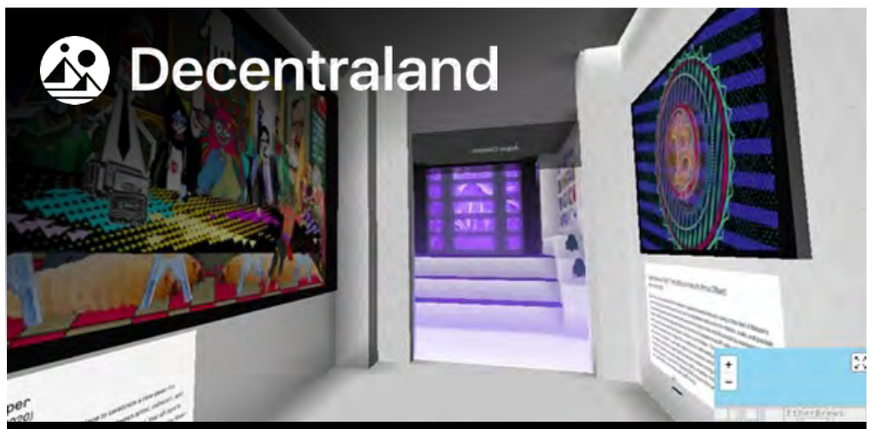
Virtual ownership will include more than just virtual goods; it will be about self-expression, prestige, personalization, and the fundamental need to belong

EXAMPLES OF OWNING VIRTUAL GOODS WITHIN THE METAVERSE

Fortnite partnered with the NBA to celebrate the NBA's 75th anniversary by offering a collection of transactable in-game character skins modeled after NBA team apparel and uniforms



Nike partnered with Roblox to create a Nike-branded virtual world called Nikeland where users can buy virtual goods from Nike; Nikeland has been visited over 32M times as of Apr. 2023



Decentraland users can display owned 2D NFTs on the platform, including displaying virtual art galleries in owned spaces

Zara partnered with Zepeto in Mar. 2022 to launch a limited-edition fashion "Metacollection" for users' avatars, with identical physical versions of the products available for purchase in Zara stores

ACTIVATE PERSPECTIVE

- Virtual ownership will become more mainstream as platforms make items more attainable, a wider range of items become available, and a greater number of brands and users participate
- Virtual goods will hold value for consumers (e.g. self-expression, status, exclusivity, personalization, ability to trade)
- Platforms will explore select circumstances in which consumers can access owned virtual goods from other platforms
- Physical items will be paired with ownership of digital items (e.g. ownership of real-world items will be reflected on virtual platforms)

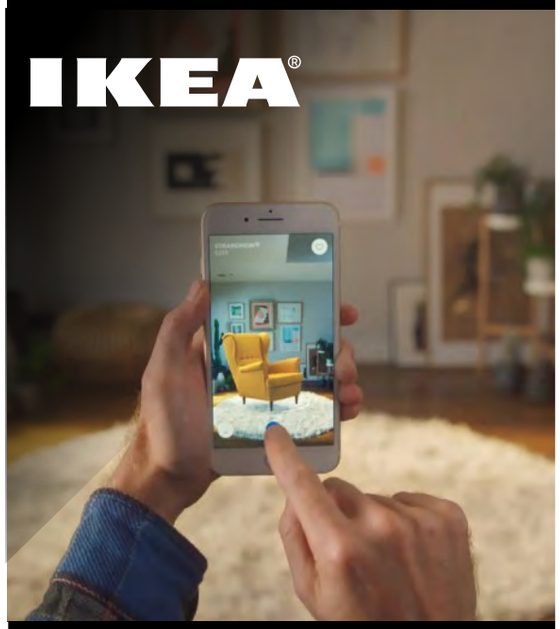
Sources: Activate analysis, Company press releases, Company sites

Spatial Computing technology (AR, VR, and MR) enables deeper user involvement with Metaverse experiences, bridging the gap between physical and digital worlds

EXAMPLES OF AUGMENTED REALITY, VIRTUAL REALITY, AND MIXED REALITY

AR: AUGMENTED REALITY

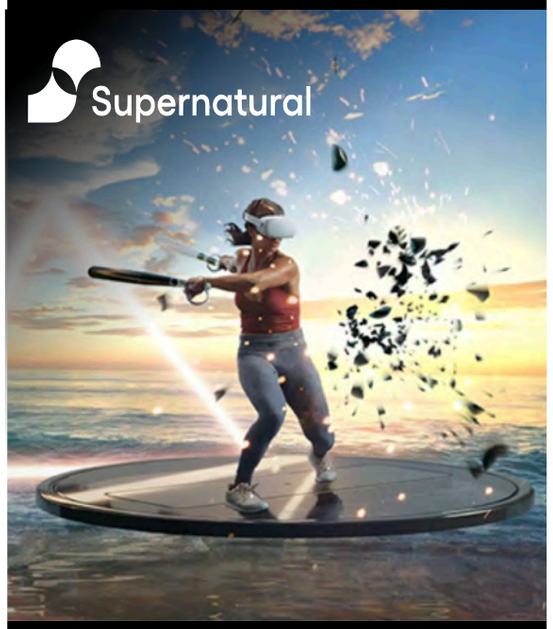
A view of the physical world with an overlay of digital components



IKEA's in-room visualization feature allows viewing of Ikea furniture in a desired space with 98% scaling accuracy

VR: VIRTUAL REALITY

A view of a fully-immersive digital environment (through a VR headset)



Fitness app, Supernatural, offers thousands of VR workout classes for Meta Quest headset users

MR: MIXED REALITY

A view of the physical world with an overlay of digital elements that individuals can interact with

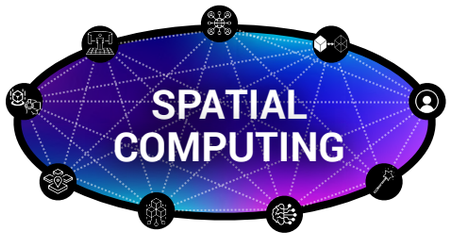
Mario Kart: Bowser's Challenge, a new attraction at Universal Studios' Nintendo World, leverages MR technology to provide a multi-dimensional, immersive experience

ACTIVATE PERSPECTIVE

- AR use cases include everyday experiences (e.g. filters, avatars, smart mirrors), novel experiences (e.g. fashion shows, museums, theme parks), and brand experiences (e.g. IKEA, Coachella, Louis Vuitton)
- VR is currently used for an assortment of activities (e.g. video games, digital fitness, social interactions) on a habitual basis; however, consumers indicate deterrents (e.g. price) to purchasing a VR headset
- MR capabilities will significantly impact the Metaverse experience, as users will be able to interact with digital elements

Sources: Activate analysis, Company press releases, Company sites

Similar to other categories that Apple has entered, we believe that Apple's Vision Pro will spur development of Spatial Computing and Metaverse experiences across the technology industry



IMPACT OF APPLE VISION PRO ON THE METAVERSE AND SPATIAL COMPUTING

EXPAND THE CONCEPT OF WHAT THE METAVERSE IS, AND WHAT IT CAN BE

(E.G. SHIFTING FROM A PREDOMINANTLY VIDEO GAME-TYPE ENVIRONMENT TO INCORPORATING GAMING ELEMENTS IN REAL-WORLD, AUGMENTED EXPERIENCES)

DRIVE DEVELOPMENT ACROSS SPATIAL OPERATING SYSTEMS, DEVICES, AND IMMERSIVE WORLDS

(E.G. ANDROID, ARCORE, ROBLOX)

Vision Pro

CATALYZE THE ECOSYSTEM AND FOUNDATIONAL STANDARDS

(E.G. SAFETY/PRIVACY, TECHNICAL PERFORMANCE EXPECTATIONS, BUSINESS TERMS)

INFLUENCE REQUIREMENTS AND DEVELOPMENT OF OTHER ENABLING TECHNOLOGIES

(E.G. WIRELESS NETWORKING/6G, EDGE COMPUTING, CLOUD)

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Sources: Activate analysis, Company sites

Vision Pro will be the catalyst to creating a broader spatial computing developer ecosystem, which will benefit from developers' experience of building with Apple's tools

SPATIAL COMPUTING

Vision Pro

VISION OS ELEMENTS FOR DEVELOPMENT AND INITIAL LAUNCH YEARS

visionOS BUILDING BLOCKS (NEW)

Windows

Volumes

Spaces

DEVELOPMENT FRAMEWORKS

SwiftUI (2019)

RealityKit (2019)

ARKit (2017)

Accessibility (2002[1])

DEVELOPER TOOLS

Xcode (2003)

Reality Composer (2019)

Unity (2005)

ACTIVATE PERSPECTIVE

The underlying frameworks and tools of visionOS have been used by iOS developers for years

- The new building blocks, Volumes, Windows, and Spaces, bring together Apple's well-established frameworks and tools
- Developers already have experience using the foundational elements of VisionOS, enabling an easier transition with fewer learning obstacles
- Just as Apple's introduction of iOS influenced other development platforms (e.g. Android), visionOS will inspire Metaverse development for non-Apple operating systems
- Future iterations of visionOS and other Spatial platforms could potentially incorporate AI, further accelerating development of consumer-grade use-cases

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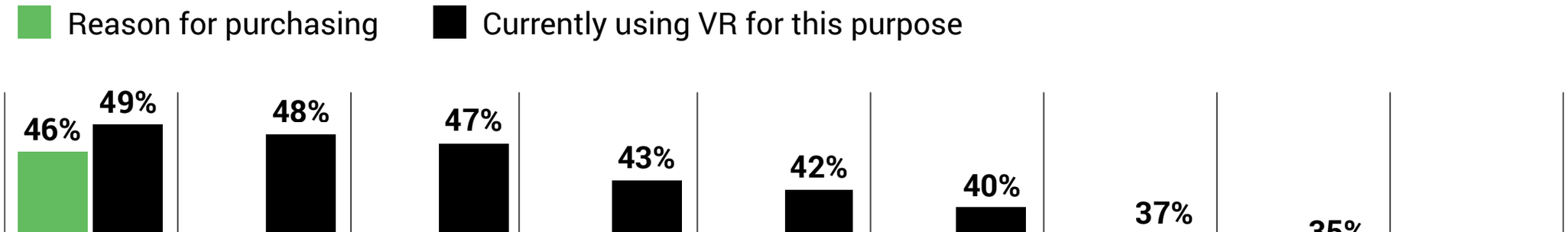
1. Universal Access was first included in the 2002 release of OS X Jaguar. VoiceOver was first included in the 2005 release of OS X Tiger.
Sources: Activate analysis, Company sites

SPATIAL COMPUTING

Actual usage of VR headsets for non-gaming/Metaverse activities has far exceeded the original purchase intent for the headset

REASONS FOR PURCHASING AND USING VR HEADSETS, U.S., 2022, % VR HEADSET USERS[1]



ACTIVATE CONSUMER INSIGHT

91% of VR users are gamers[2], and **78%** of VR users use VR for non-gaming activities

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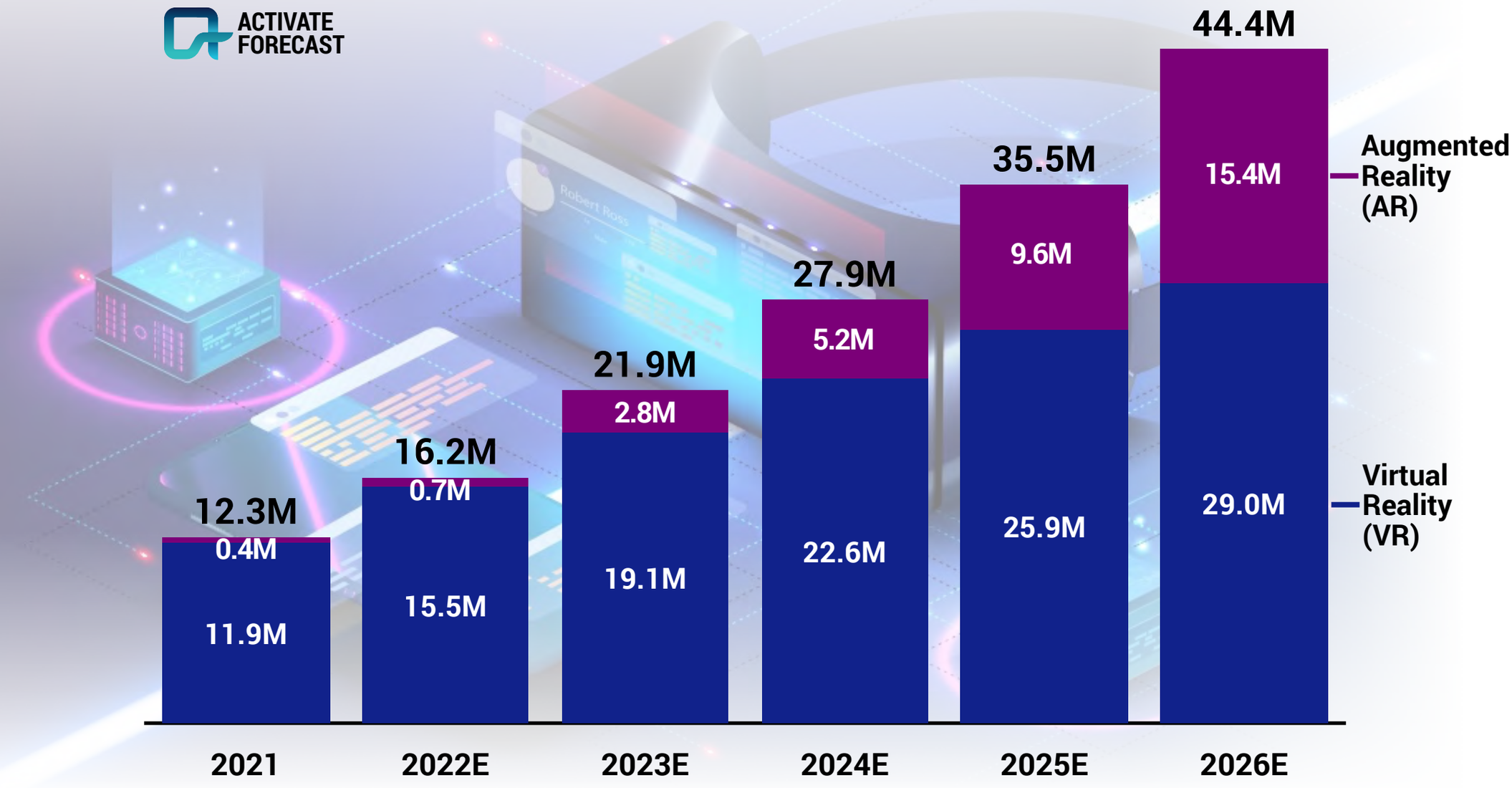
1. Adults aged 18+ who have used a VR headset in the last 12 months. 2. Adults aged 18+ who currently play video games.
Sources: Activate analysis, Activate 2022 Metaverse & NFT Consumer Research Study (n = 3,078)

SPATIAL COMPUTING

The growth of the Metaverse will far exceed the penetration of VR/AR devices; 2D Metaverse experiences have global scale and participation today and will continue to do so for years to come

AR AND VR HEADSET UNIT SALES[1], GLOBAL, 2021-2026E, MILLIONS UNITS

ACTIVATE FORECAST



2021-2026E CAGR:

- Augmented Reality (AR): 29%
- Virtual Reality (VR): 107%
- 20%

1. Excludes Google Cardboard and other headsets with no built-in technology. Figures do not sum due to rounding.
Sources: Activate analysis, AR Insider, Company press releases, Company sites, eMarketer, IDC, Morgan Stanley Research, Omdia, PricewaterhouseCoopers, Road to VR, Sensor Tower, Statista, Steam Spy, Strategy Analytics, SuperData, VGChartz

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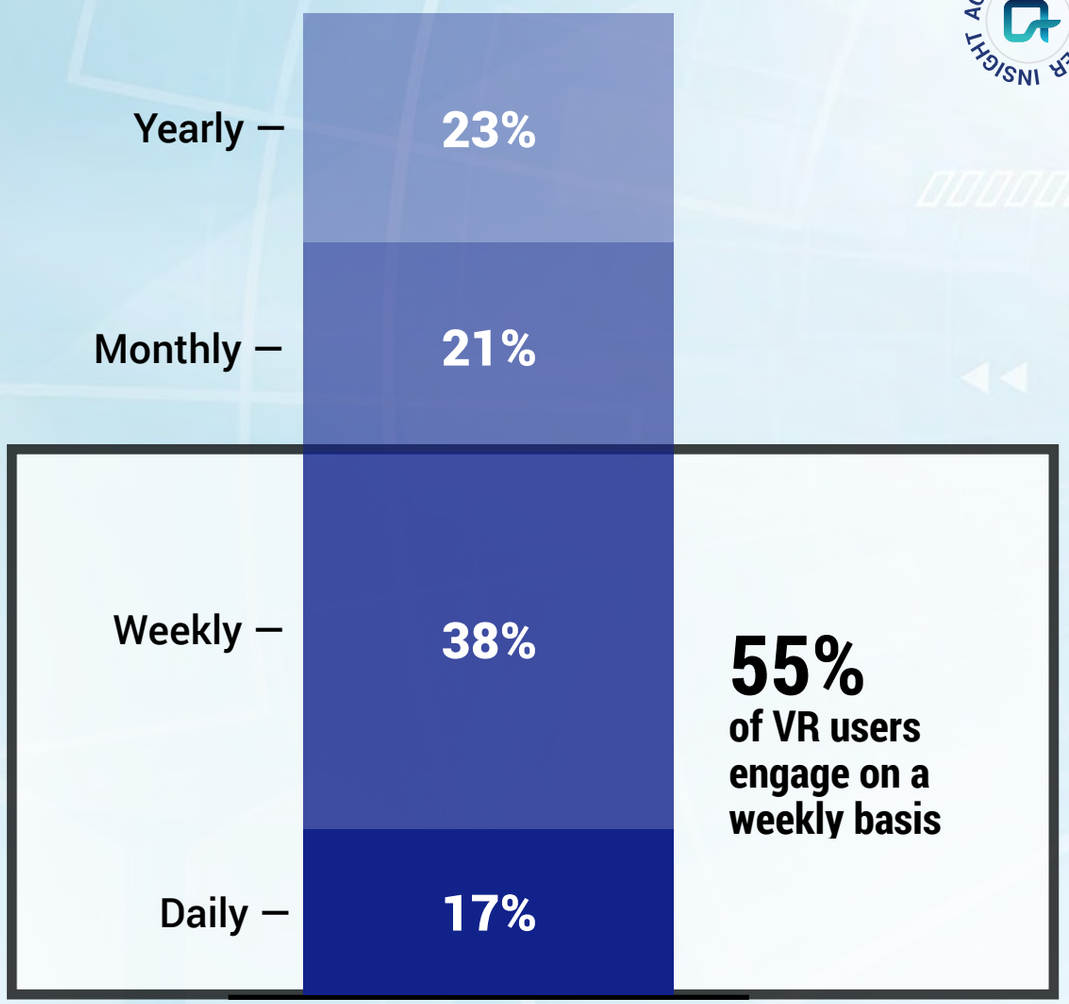
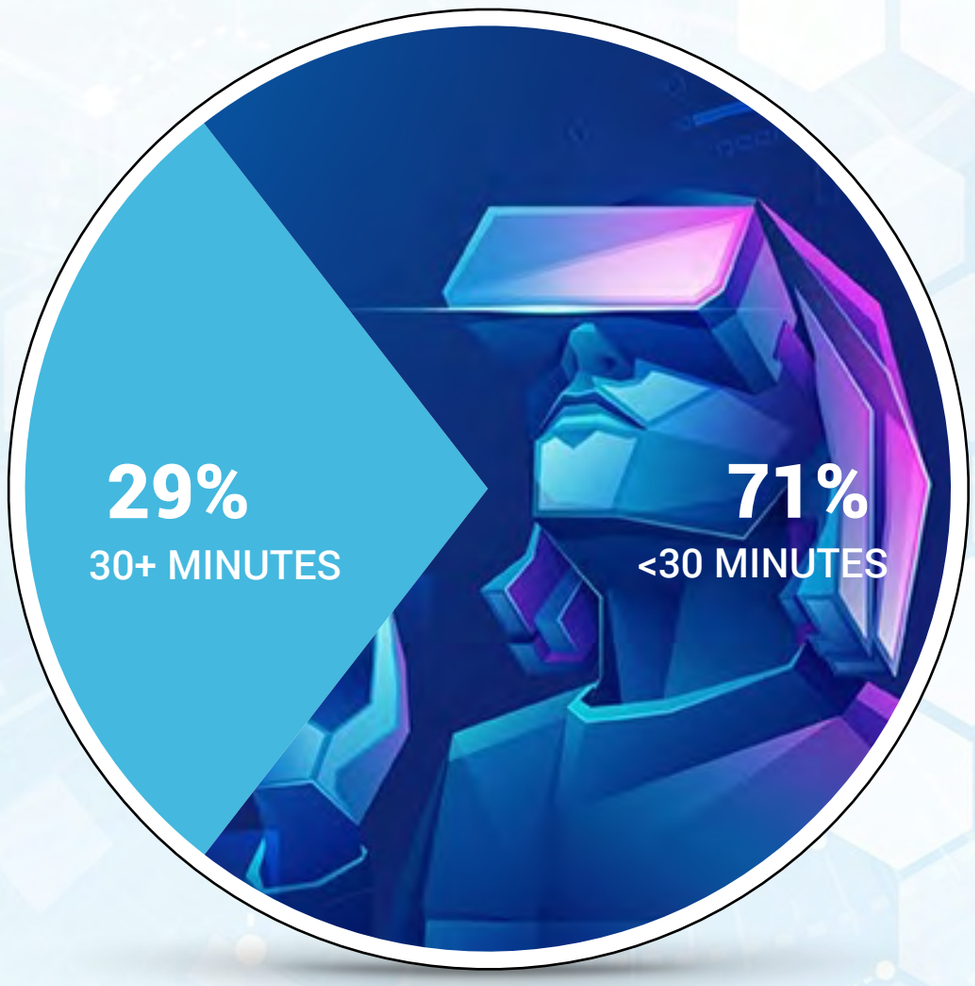
SPATIAL COMPUTING

For the majority of VR owners, VR is a habit; however, most people cannot spend more than 30 minutes per session, emphasizing the importance of 2D experiences

FREQUENCY OF VR HEADSET USE,
U.S., 2022, % VR HEADSET USERS[1]



AVERAGE DURATION OF VR HEADSET SESSION,
U.S., 2022, % VR HEADSET USERS[1]



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Note: Figures may not sum due to rounding. 1. Adults aged 18+ who have used a VR headset in the last 12 months.
Sources: Activate analysis, Activate 2022 Metaverse Research Study (n = 3,078)

SPATIAL COMPUTING

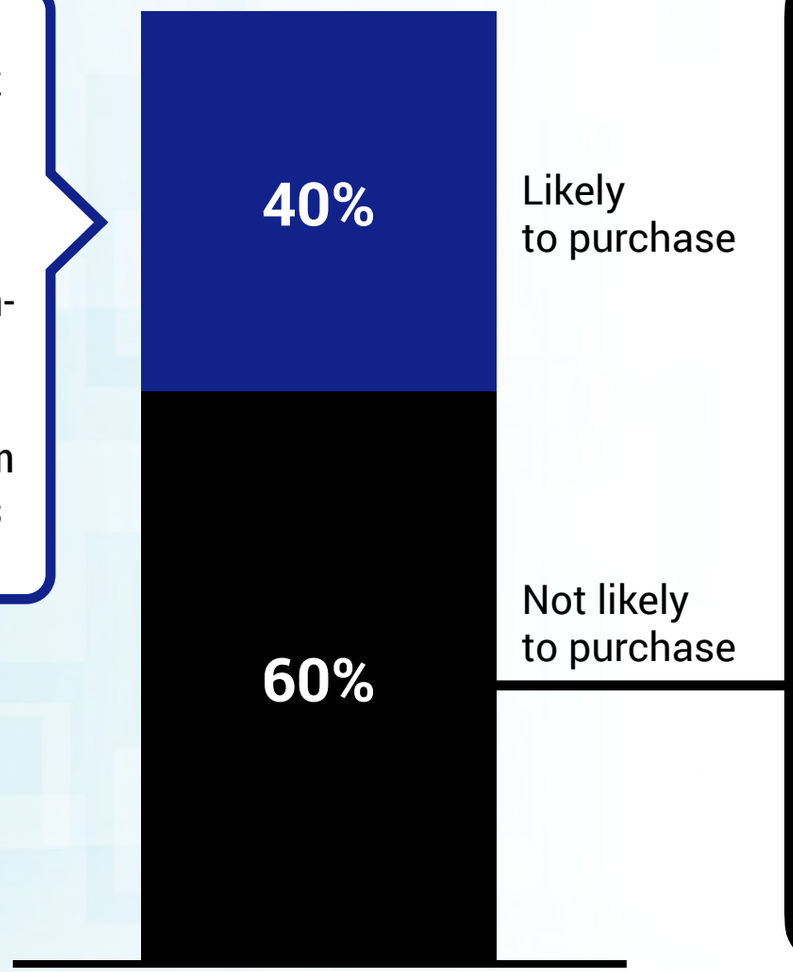
For large-scale adoption, VR headsets will need to be available at a lower price point

LIKELIHOOD TO PURCHASE A VR HEADSET IN NEXT 12 MONTHS, U.S., 2022, % ADULTS AGED 18+

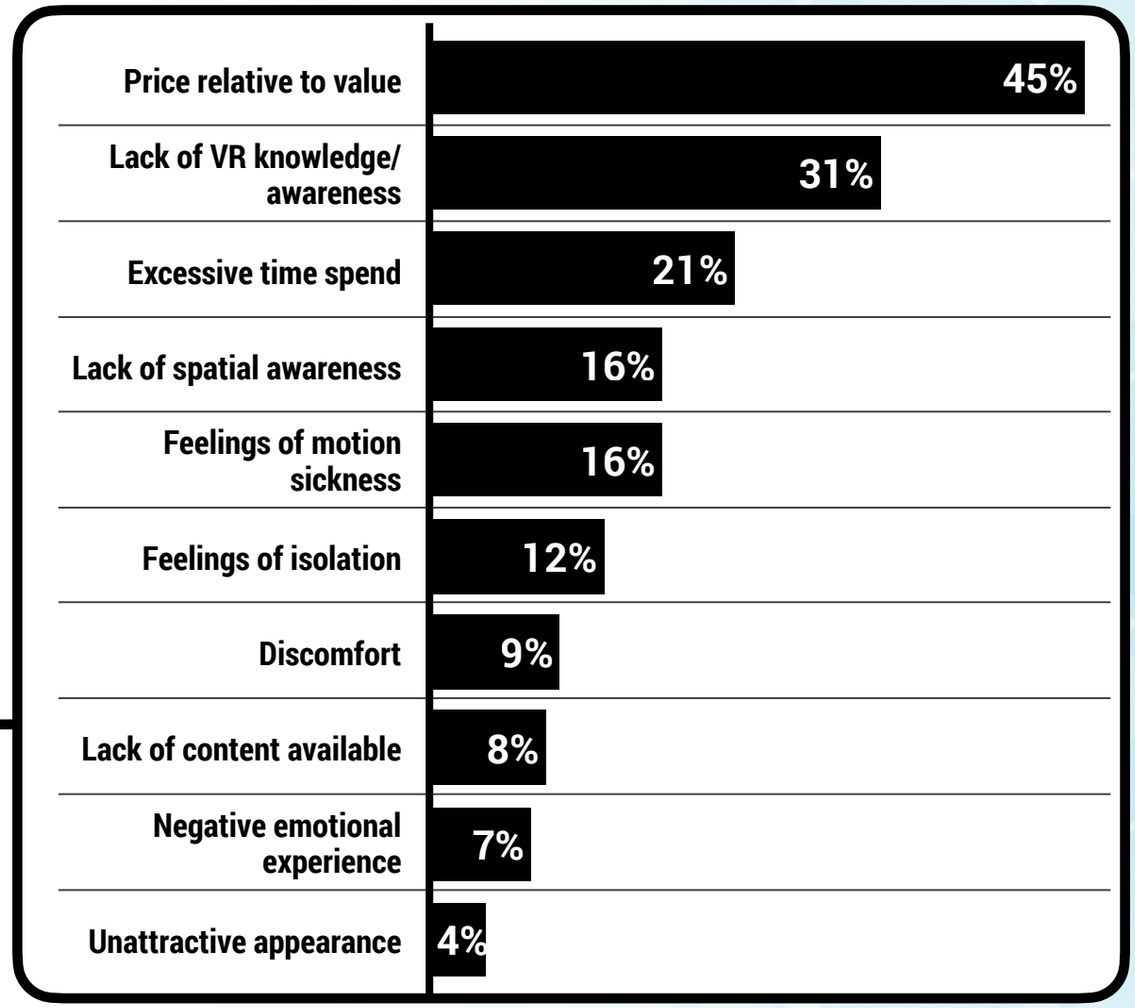
Current VR headset owners are

5X

more likely than non-owners to want to purchase an additional headset in the next 12 months



REASONS FOR NOT INTENDING TO PURCHASE A VR HEADSET, U.S., 2022, % NON-VR HEADSET OWNERS



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Sources: Activate analysis, Activate 2022 Metaverse Research Study (n = 3,078)

METAVERSE: TIME FOR PRACTICAL APPLICATIONS

THE METAVERSE MATTERS NOW

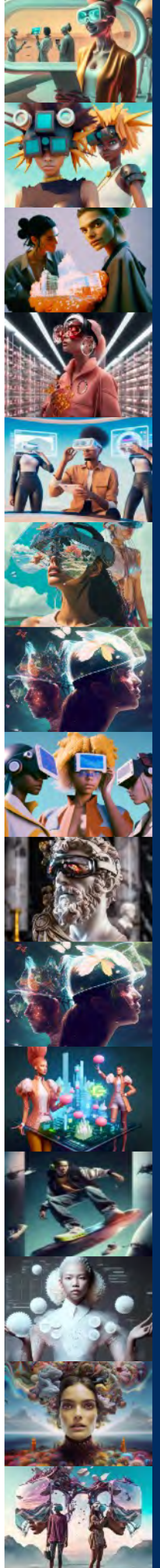
AI'S IMPACT ON THE METAVERSE

ELEMENTS OF THE METAVERSE

» METAVERSE ECOSYSTEM

PRACTICAL PLAYBOOK FOR THE METAVERSE

ABOUT ACTIVATE AND OUR CAPABILITIES



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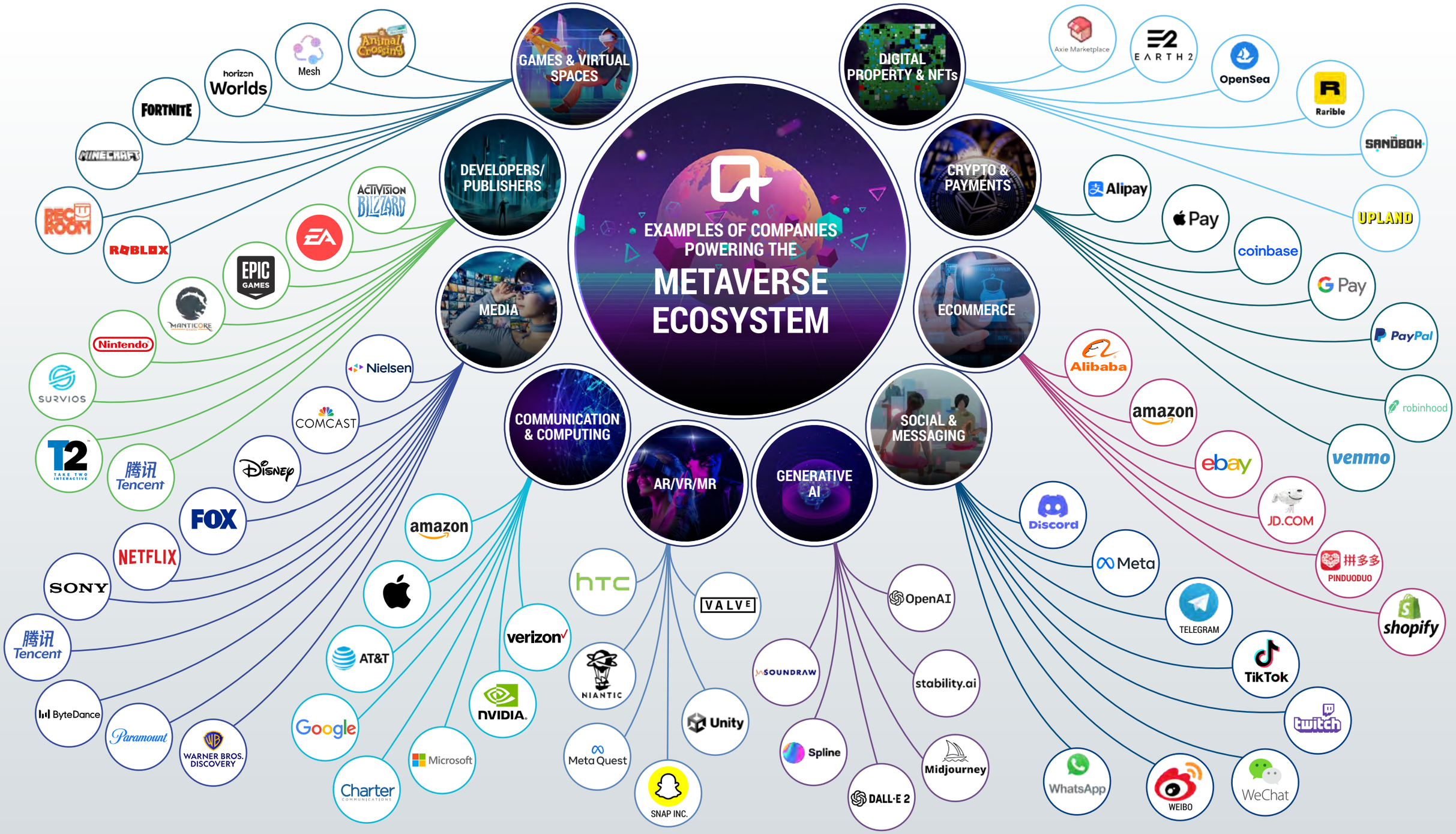
Over the next years, companies building the Metaverse will be part of an extensive ecosystem



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Note: Not exhaustive. Information as of April 2023.
Sources: Activate analysis, Company sites

The major technology and gaming companies will build out their capabilities across each element of the Metaverse

EXAMPLE METAVERSE CAPABILITIES OF MAJOR TECHNOLOGY AND GAMING COMPANIES

	amazon	Apple	Epic Games	Google	Meta	Microsoft	Roblox	Sony	Tencent
Immersive Experiences	games, Luna		FORTNITE		Gaming, Beat Saber, Horizon Worlds	Xbox, Activision, Minecraft, Mesh	ROBLOX	PlayStation, Bungie, PlayStation Plus	Tencent Games
Social Interactions	twitch	iMessage	Fortnite Party Royale	Project Starline (In development)	Instagram, Messenger, Horizon Worlds	Teams, LinkedIn, Mesh, Minecraft	Roblox Chat & Community Space		QQ
Digital Twins	aws IoT TwinMaker		Unreal Engine	Google Cloud: Supply Chain Twin and Pulse		Azure Digital Twins			Tencent Cloud
Identity		Memoji	Fortnite Avatars	Google Chrome Avatar	Meta 3D Avatar	Teams and Mesh Avatars	Roblox Avatars	Destiny, Guardian Creation	超级QQ秀 SUPER QQ SHOW
Creation & Agency	Amazon Sumerian, twitch	ARKit, Reality Composer, RoomPlan	Unreal Engine, Fortnite Creative	ARCore, YouTube VR	Meta Spark	Minecraft	Roblox Studio	dreams	
Generative AI	Amazon Bedrock, Amazon Titan			Google Bard AI, Google Workspace, Research projects including Google Muse (image generation), Google MusicLM (song generation)	Announced plans to launch generative AI to optimize advertisements and assist in Metaverse creation by December	Bing, OpenAI Integration, Copilot (Announced)	Material Generator Code Assist		Researching Generative AI tech based off Hunyuan training model
Economy	amazon appstore, amazon pay	App Store, Pay	Epic Games Store, Fortnite Item Shop	Google Play, G Pay	Meta Quest Store, Meta Pay	Microsoft Store	Roblox Game Shop, Robux	PlayStation Store	WeChat Pay, 应用宝 MY APP
Virtual Ownership	aws Build NFT Applications	Apple NFT Trading Cards (Rumored)	Enable NFT Games via Epic Games Store (e.g. Blankos Block Party)		NFT Sharing with Verified Ownership on Instagram/ Facebook				幻核 Magic Core (No longer issuing new NFTs)
Spatial Computing: AR	AR View	Glass (Rumored)	RealityScan	Google Maps Live View, Google Lens, Glass	Meta Quest Pro, Reality Labs	Microsoft HoloLens 2, Mesh		Partnership Kramer	ultraleap (Series D Investment)
Spatial Computing: VR	prime video vr	NEXTVR		Google Earth VR, YouTube VR	Meta Quest Pro, Reality Labs, Horizon Worlds	HP Reverb G2 Co-development, Mesh	Roblox VR	PlayStation VR2	ultraleap (Series D Investment)

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Note: Not exhaustive. Categorization reflective of forward-looking indicators for Metaverse applications (e.g. NFTs for virtual ownership, real-time synchronization for digital twins). Information as of April 2023.
Sources: Activate analysis, Company sites

We expect to see significant and sustained investment in innovation over the next years

EXAMPLE COMPANIES BUILDING FOUNDATIONAL ELEMENTS OF THE METAVERSE

IMMERSIVE EXPERIENCES	SOCIAL INTERACTIONS	DIGITAL TWINS	IDENTITY	CREATION AND AGENCY	GENERATIVE AI	ECONOMY	VIRTUAL OWNERSHIP	SPATIAL COMPUTING
BITCRAFT	GRAVVITY	5x5 Technologies	Avatoon	INFINITE REALITY	Blockade Labs	CODA PAYMENTS	exclusible	blippAR
CLOCKWORK LABS	HIGHRISE	LIVING CITIES	DIDIMO	inverse	DALL·E 2	ELUV.IO	HORIZON BLOCKCHAIN GAMES	brightline
BLOKTOPIA	IMVERSE	PassiveLogic	FILTERYA	inworld	IIElevenLabs	enya.ai	Immutable	DIGILENS
MINES OF DALARNIA	imvu	Genies	LALALAND	Pixel Canvas	LUMA AI	metajuice	LOOKSRARE	eon reality
HABYTAT SMARTERVERSE	KUMOSPACE	SharperShape	Rephrase.ai	READY PLAYER ME	Midjourney	MetaStreet	OpenSea	JADU AR
iluvium	SpatialChat	siteaware	soul machines	Spatial	OpenAI	MoonPay	Rarible	NIANTIC
METROPOLIS WORLD	Topia	VICTORYXR	Tafi		SENSORIUM	VOAX	REBASE	OSSO VR
PLAYABLE WORLDS	VR CHAT				SOUNDRAW	tZERO	sorare	Portal ONE
REC ROOM					Spline			zSpace
SOMNIUM SPACE					stability.ai			
					UNAKIN			

EXAMPLE INVESTORS

Accel · GENERAL ATLANTIC · INSIGHT PARTNERS · TIGERGLOBAL · andreessen horowitz · Goldman Sachs Asset Management · SEQUOIA

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Note: Not exhaustive. Companies listed by primary category but may have capabilities in other categories listed.
Information as of April 2023.
Sources: Activate analysis, Company press releases, Company sites

There will not be a single Metaverse platform — interoperability between platforms will take place through third-party companies and applications, creating significant opportunities for all businesses to capitalize on the potential of the Metaverse

INTEROPERABILITY LAYERS OF THE METAVERSE

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Source: Activate analysis

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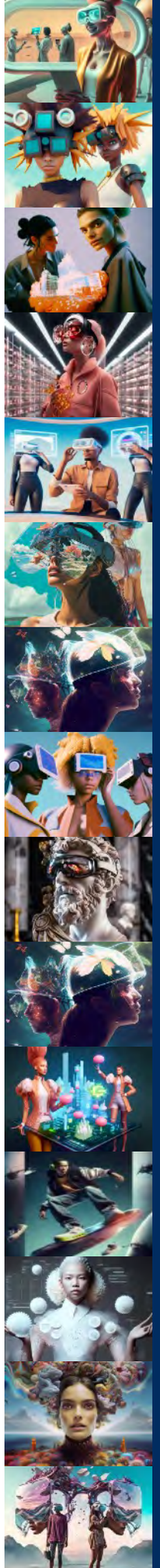

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Companies, across a broad set of industry verticals, will need to create strategies and practical playbooks to exploit and profit from their Metaverse opportunities

EXAMPLES OF POTENTIAL METAVERSE USE CASES

✦ Consumer ✦ Commercial ✦ Industrial

Media

- ✦ Expanded social and creator capabilities within video games
- ✦ Live music events (e.g. concerts, festivals)
- ✦ Viewing live sporting events in VR / immersive environments
- ✦ Interactive video content and movie screenings in virtual environments
- ✦ Immersive virtual presentations and conferences

Retail/Commerce

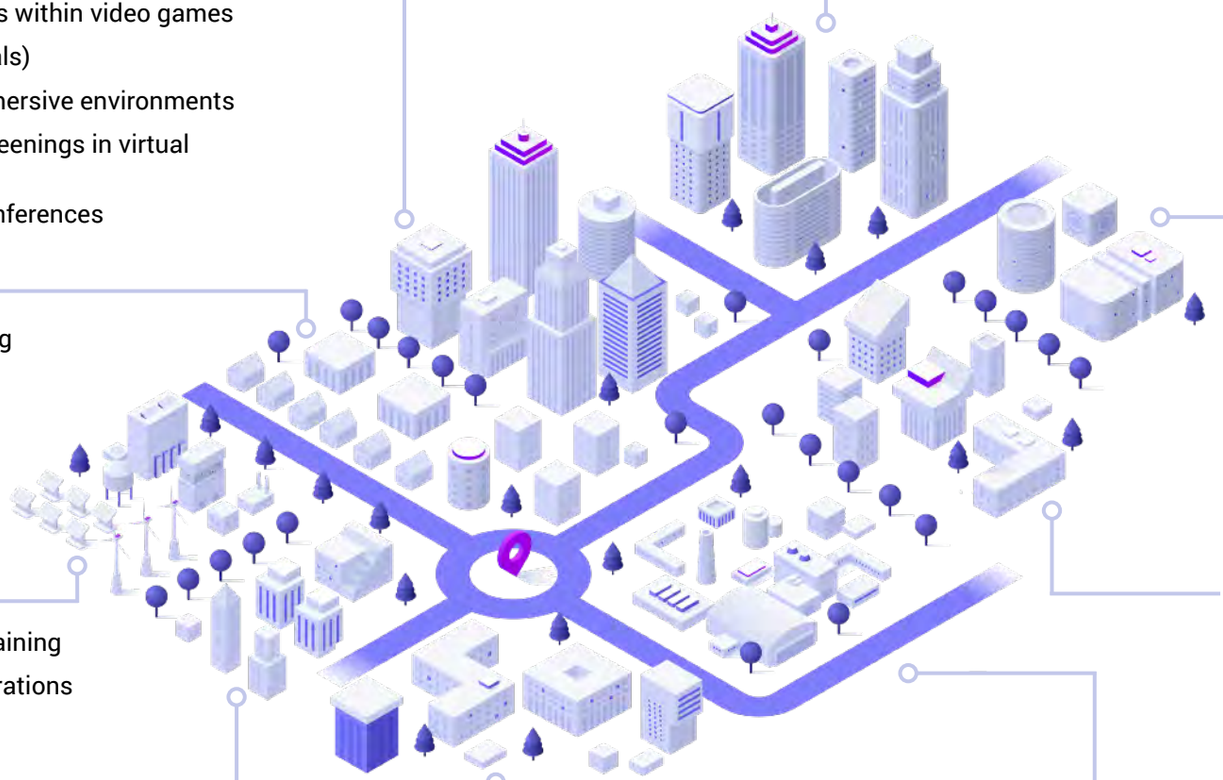
- ✦ Personalized virtual stores and shopping experiences
- ✦ Brand advertising/sponsorships within Metaverse platforms
- ✦ Inventory and delivery network management

Energy/Manufacturing

- ✦ Immersive employee onboarding and training
- ✦ Digital twins to streamline/monitor operations (e.g. oil rigs, mines, wind turbines)
- ✦ Equipment design and engineering

Financial/Professional Services

- ✦ Virtual banks and payment systems/platform integrations
- ✦ Blockchain-enabled smart contracts
- ✦ Customization and use of virtual company hubs/office environments



Healthcare

- ✦ In-home patient care/access to virtual doctors
- ✦ Enhanced medical education and immersive training (e.g. surgery)
- ✦ Improved medical imaging and research with digital technologies

Technology

- ✦ Spatial computing to design/personalize Metaverse environments
- ✦ Employee collaboration and communication tools (e.g. shared whiteboards, spatial audio, custom avatars)
- ✦ Enabling hardware and device manufacturing (e.g. VR headsets, wearables, accessories)

Fitness

- ✦ Live/immersive group workout classes enhanced through AR/VR
- ✦ Gamification (e.g. digital asset rewards for completing fitness classes/ challenges)
- ✦ Digital twins of physical fitness spaces in virtual environments

Public Sector/Education

- ✦ Immersive classrooms, coaching, and teaching assistance
- ✦ Virtual government spaces (e.g. city hall, civil service center, embassy)
- ✦ Smart cities and emergency planning

Automotive

- ✦ Immersive brand presence in virtual worlds (e.g. virtual showrooms, branded content)
- ✦ Access to and ownership of digital twin versions of real-world vehicles
- ✦ Enhanced vehicle design/engineering with mixed-reality technology

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Source: Activate analysis

We see different use cases, strategies and playbooks across Consumer, Commercial, and Industrial Metaverses

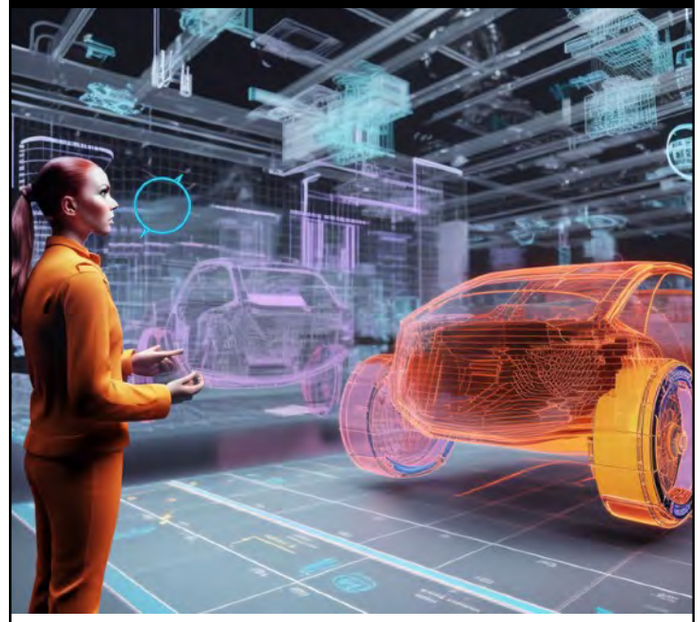
CONSUMER METAVERSE

Immersive, consumer-facing experiences and content, where users can interact, create, and participate in various activities (e.g. events, games, virtual economies, socialization)

COMMERCIAL METAVERSE

Employee collaboration, communication, education, and training in a Metaverse-based work environment

INDUSTRIAL METAVERSE



Optimization of enterprise systems to improve the visualization, design, and management of physical structures/industrial operations

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Source: Activate analysis

The Metaverse is here today; companies will need to start testing and building their Metaverse playbooks to lead their next wave of digital innovation (1 of 4)

ELEMENTS OF A METAVERSE PRACTICAL PLAYBOOK

START WITH THE USER

- Focus on what will drive deep consumer engagement, improve social interactions, and enable user creation
- Provide collaborative features and functionality
- Attract users with captivating consumer-grade content and events

EMPOWER CO-CREATION AND USER PERSONALIZATION

- Give users agency to create, ceding control to the user and allowing them to shape their own experiences
- Enable users to define and personalize their Metaverse experiences (e.g. avatars, virtual items, environments, games, events)

CATALYZE AND BUILD FOR SOCIAL INTERACTIONS AND CONNECTIONS

- Leverage the Metaverse's potential as a social medium
- Engage users through shared experiences, communication, communities, collaborative features, and social interactions
- Prioritize social experiences over immersive enablement, in the near term

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Source: Activate analysis

The Metaverse is here today; companies will need to start testing and building their Metaverse playbooks to lead their next wave of digital innovation (2 of 4)

ELEMENTS OF A METAVERSE PRACTICAL PLAYBOOK

DEVELOP FOR 2D, WHILE BUILDING THE FOUNDATION FOR 3D

- Start with 2D platforms, which have large numbers of users today and will drive user scale and participation for years to come
- Mixed reality and 3D will significantly enhance immersion but will not yet be critical for the growth of a company's Metaverse presence
- Test 3D technologies, which hold the promise of bringing together the virtual and physical worlds, once the technology is more sophisticated and in wide use

LEVERAGE GENERATIVE AI TO LOWER THE BARRIER TO ENTRY FOR CREATION AND SCALE FASTER

- Leverage developer tools and software that require little to no experience to use
- Apply AI across your early Metaverse creator applications to realize the visions of your users
- Build AI into your innovation and product development process, creating virtual feedback from customers

PRIORITIZE METAVERSE INVESTMENTS IN THE CONTEXT OF YOUR COMPANY'S BROADER CONSUMER ENGAGEMENT AGENDA

- Fundamentally rethink your value propositions and how they translate into virtual worlds – from how you engage with consumers, to how your employees work together, to how you can optimize industrial systems
- Begin informed investments and develop early use cases and applications
- Don't let perfect get in the way of innovation; test, iterate, and retest

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Source: Activate analysis

The Metaverse is here today; companies will need to start testing and building their Metaverse playbooks to lead their next wave of digital innovation (3 of 4)

ELEMENTS OF A METAVERSE PRACTICAL PLAYBOOK

BUILD FOR VIRTUAL ECONOMIES

- Create economies and virtual goods for consumer use / purchase
- Leverage advertising, sponsored content, and brand integrations
- Provide a developer ecosystem and the opportunity for individual income

TAKE ADVANTAGE OF EARLY USE-CASES, APPLICATIONS, AND ENTRY POINTS OF THE METAVERSE

- **Determine the translation of current business models and products/services into virtual worlds and consider the full range of use-cases across:**
  - **Consumer:** Establish immersive, consumer-facing experiences and content to enhance the user value proposition and increase engagement
  - **Commercial:** Enable employee collaboration, communication, education, and training
  - **Industrial:** Leverage digital technologies to optimize enterprise systems

PLAY IN THE LAYERS OF THE METAVERSE STACK WHERE YOU CAN WIN

- **Evaluate current assets, capabilities, and value propositions to define your company's role in the Metaverse stack:**
  - **Content, Experiences, & Social Interactions**
  - **Hardware & Devices**
  - **Platforms & Enablers**
  - **Infrastructure**

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Source: Activate analysis

The Metaverse is here today; companies will need to start testing and building their Metaverse playbooks to lead their next wave of digital innovation (4 of 4)

ELEMENTS OF A METAVERSE PRACTICAL PLAYBOOK

ADDRESS POTENTIAL RISKS AND KEY CHALLENGES FOR METAVERSE INITIATIVES

- Identify potential threats to success, including: security/safety, accessibility, and IP/ownership
- Anticipate overarching Metaverse ecosystem challenges, including: governance, authenticity/misinformation, and interoperability between platforms

FUTURE-PROOF YOUR METAVERSE STRATEGY

- Develop for multiple Metaverse environments, not betting on any single platform
- Prioritize accessibility and scale over graphical fidelity
- Bet on technology that is extensible and focus on platform portability
- Create a diversified portfolio of Metaverse initiatives
- Adopt a test and learn approach to adapt as the industry evolves

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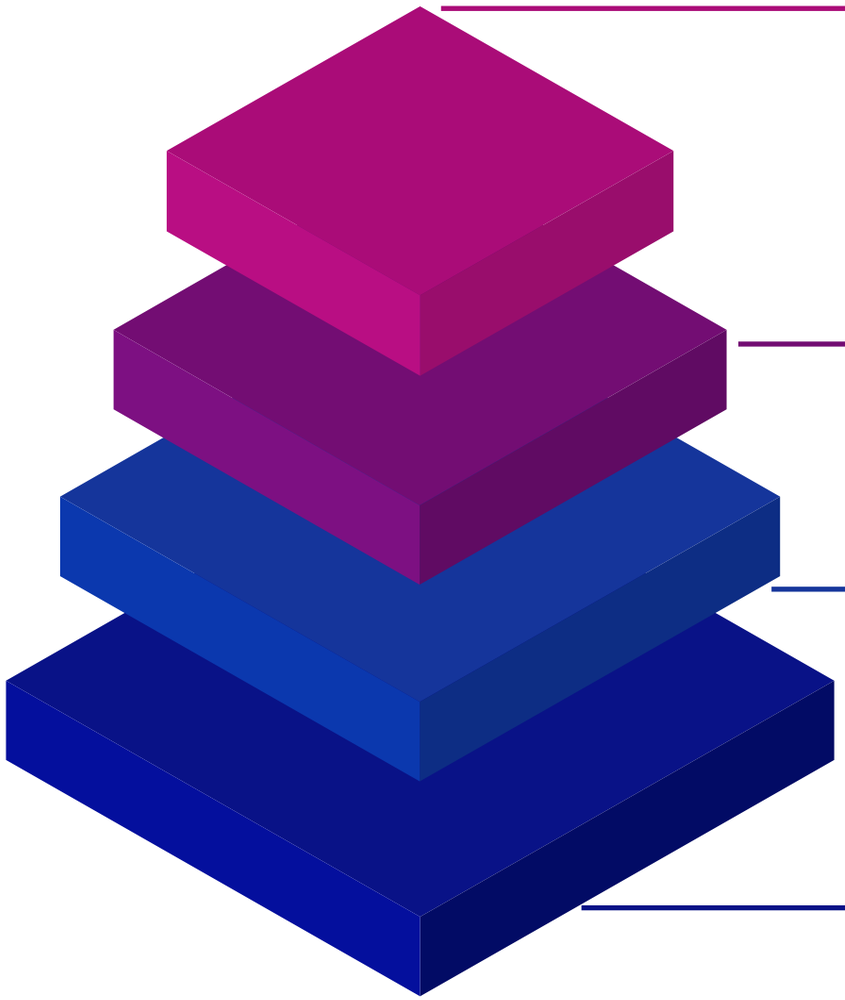
Source: Activate analysis

It will be critical for companies to play in the layers of the Metaverse stack where they can win

THE METAVERSE STACK



1 Content, Experiences, & Social Interactions

- User-facing operating systems
- Developer and creator content
- Virtual worlds and environments
- Consumer and enterprise applications

2 Hardware & Devices

- Headsets and glasses (AR/VR/MR)
- Wearables
- Mobile phones
- Consoles & PCs
- Accessories & components

3 Platforms & Enablers

- OS layers
- App ecosystems
- Developer platforms
- Spatial computing
- 3D engines
- Security and identity
- Payment platforms

4 Infrastructure

- Network/connectivity
- 5G/6G
- Cloud
- Semiconductors
- Edge solutions (e.g. GPUs, MEC)

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Source: Activate analysis

In addition, company leaders will need to address potential risks and key challenges for Metaverse initiatives

CHALLENGES	TACTICS TO ADDRESS
SECURITY/SAFETY	• Create **user-focused security & privacy regulations** (e.g. protection of user data, management of asset ownership) • Develop **platform-specific security measures**
GOVERNANCE	• Determine **regulations and compliance mechanisms** to mitigate unforeseen consequences related to **virtual interaction** (e.g. online harassment), **data governance, asset ownership** (e.g. mitigating theft), and **antitrust issues**
IDENTITY	• Create **trustworthy "identity" system**, considering pros/cons of various solutions: - **Single, global identity** (tighter security, close tracking of fraud/phishing attacks) - **Multiple identities** (greater flexibility for user expression, but rise in impersonation tactics such as deepfakes) - **Decentralized identity** (i.e. establishing multi-factor authentication using unduplicated credentials)
AUTHENTICITY/ MISINFORMATION	• Incorporate **social conversation-monitoring services** (e.g. fact-checking, chat monitor), **AI technology,** and **protocols to reduce misinformation**, harassment, and abuse • Construct **verification system for virtual economies** • Establish **guidelines for companies to embed safety mechanisms** into Metaverse experiences to avoid brand exploitation
IP/OWNERSHIP	• Establish **legal protection for inventors and creators**, upholding **copyrights/trademarks** and integrity of legacy brands • Generate **guidelines for hosting others' content** in the Metaverse and **verification of assets** • Leverage a **decentralized network to scale content storage management**
ACCESSIBILITY	• Apply **uniform industry standards and protocols to hardware/software** (e.g. VR headsets, speech recognition) • **Utilize existing technology today, but plan for how technology will evolve** (e.g. networks, hardware) in order to support many of the **future use-cases** described by developers and companies (i.e. fully immersive, synchronous environments) • Bolster **disability accommodations** (e.g. captioning system, smart touch and haptics)
INTEROPERABILITY	• Pursue **virtual environment interoperability** to allow user participation in unified, socio-cultural activities • Target interoperability across **technological connectivity** (e.g. seamless networking/communication), **economic ease** (e.g. cross-functional virtual wallets / assets), and **user experience** (e.g. consistent design/set-up across platforms)

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Source: Activate analysis

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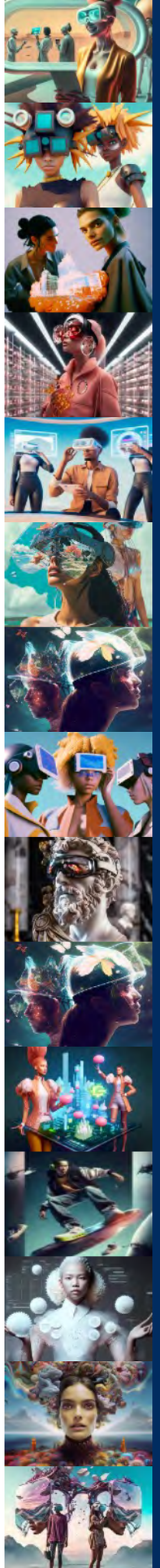

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Activate's capabilities to position companies for growth

GROWTH STRATEGY

- Work with CEOs, Founders, and senior executives to build the strategic roadmap for growth and value creation
- Identify new market opportunities (business areas, new products/ services, M&A)
- Create pragmatic growth initiatives to capture the opportunities

REVENUE OPTIMIZATION

- Go-to-market
- Customer acquisition
- Loyalty, retention, and reactivation
- Sales activation
- Customer insight and segmentation
- Marketing optimization
- Pricing

IDENTIFY OPPORTUNITIES AND BUILD TECHNOLOGY-ENABLED BUSINESSES

- Identify major new opportunities
- Evaluate through consumer and market research
- Build the content, experience, functionality, distribution technology, and business plan
- Define the execution roadmap

IMPLEMENTATION AND EXECUTION MANAGEMENT

- Create major initiatives
- Set revenue targets
- Create roadmap/timeline and ensure delivery
- Build organization and team
- Define and specify technology architecture
- Integration
- Build capabilities and enabling technology

PRINCIPAL AND PRIVATE EQUITY INVESTORS

- Strategic due diligence
- Value creation programs and strategies
- Publicly-traded company opportunities
- Opportunity identification
- Sell-side diligence and market evaluation

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Beyond the Hype Cycle:
The Metaverse Matters Now More Than Ever

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