The Metaverse

Quantum Labor Analysis Report

SkyHive

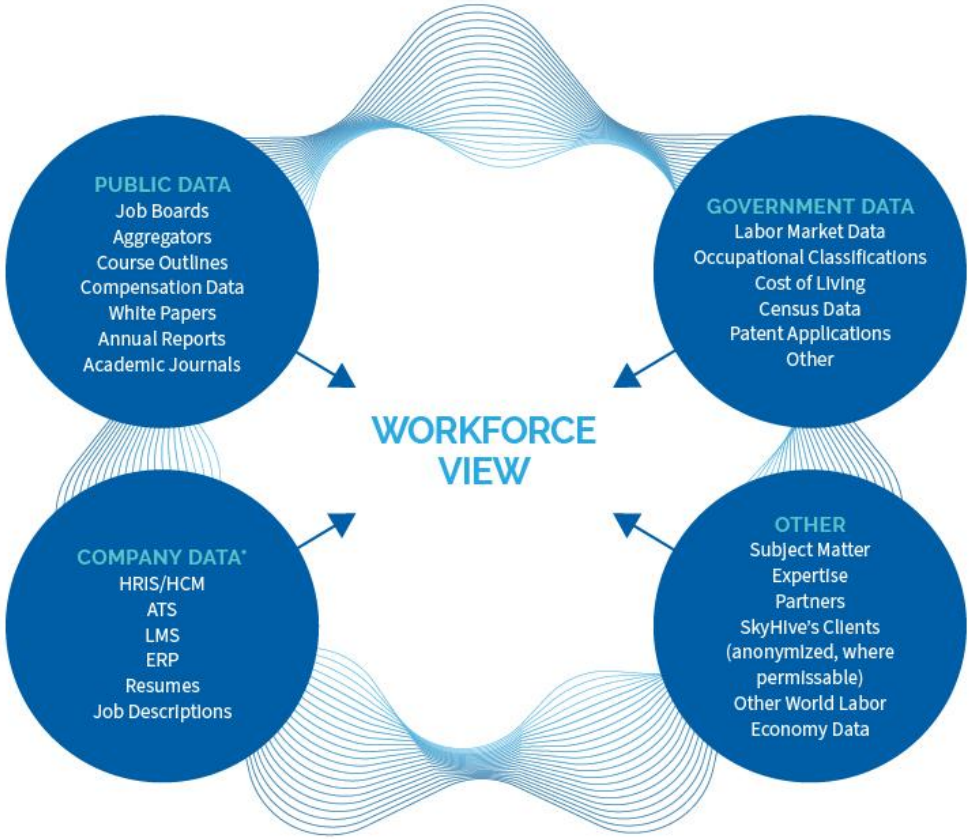
Unleashing Human Potential

SkyHive
Unleashing Human Potential

Executive Summary

SkyHive's Quantum Labor Analysis® analyzes publicly available people and company data, which is enriched using artificial intelligence to provide comprehensive labor market analysis.

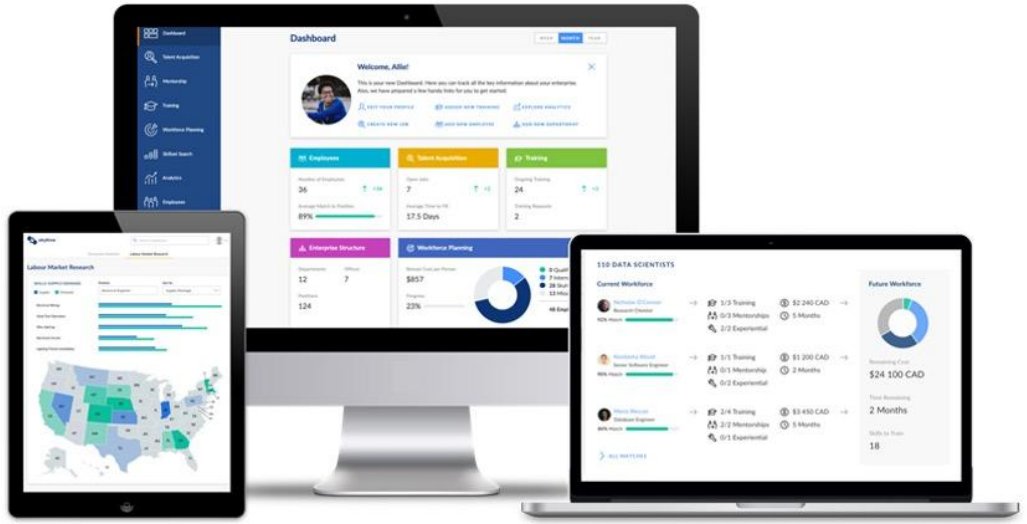
We used our technology to analyze all publicly available data on all companies and people pertaining to the Metaverse / Web3 from supply, demand, current and future skills, and learning and development perspectives.



Unleashing Human Potential

SkyHive is on a mission to optimize labor market efficiencies in real-time for companies, communities and national economies. We power the future of work at its most granular level: skills.

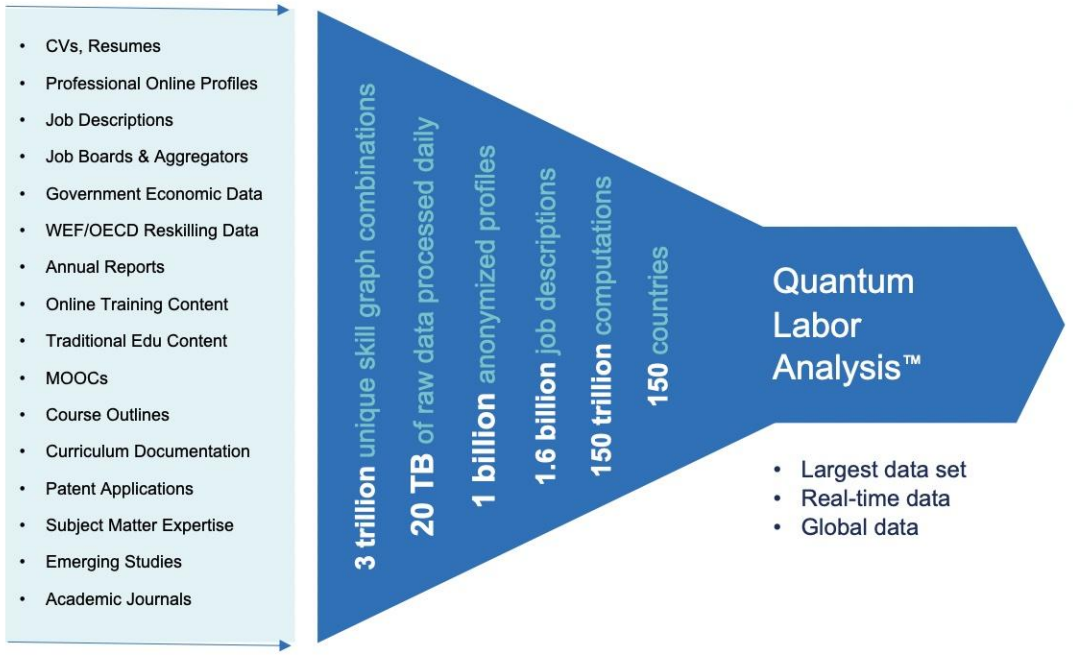
Real-time, global labor market data with transparent and unbiased artificial intelligence provides actionable insight into current and emerging skills, skills gaps, industry benchmarks and reskilling options.



Methodology

Where does SkyHive's data come from?

- Global data from 150 countries
- Knowledge graph comprising of 6.2B nodes and 2.8 trillion relationships
- Engine computing 150 trillion data points per day across various dimensions; ingesting ~20TB of raw data each day
- Data stored in an Advanced Data Lakehouse Architecture
- Ability to ingest and process data in multiple languages
- Data partitioned across multiple dimensions:
  - Geography
  - Time
  - Job families
  - Industry
  - Contextual



Metaverse Characteristics

Gartner predicts 25% of people will spend at least an hour a day in The Metaverse in 2026 participating in events, educational activities and playing, interacting, shopping, or working.

The Metaverse is a massively parallel network of interoperable 3D worlds with interconnected synchronous experiences and sense of presence built by applications, devices and products, tools, and infrastructure. It encompasses data, identity, history, entitlements, objects, communications, and payments.

It is dematerialization of physical space, distance, and objects.

It is the new internet that reprograms our experiences and changes the workforce.

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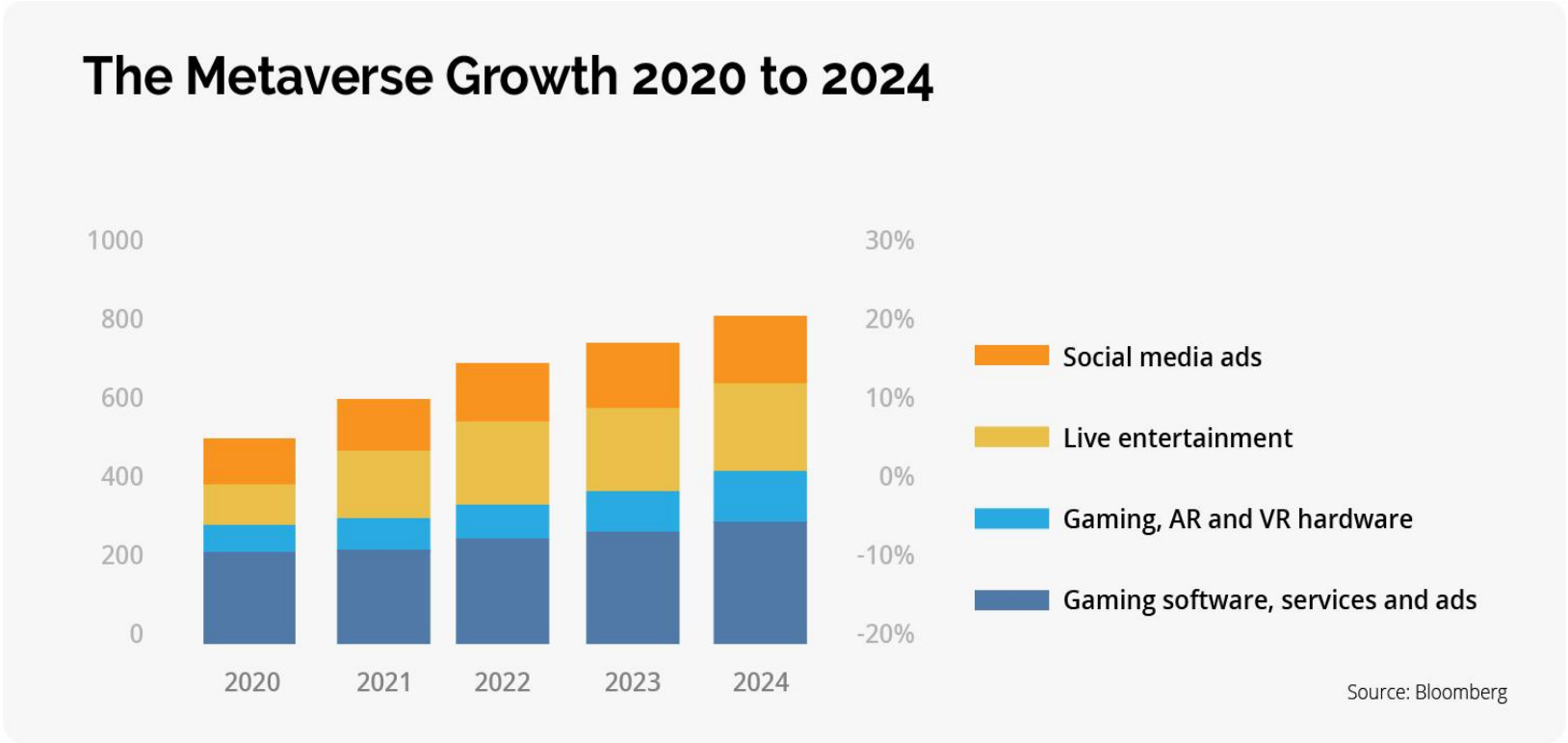
Metaverse Characteristics

- Open to All
- Successor of the Internet
- Functioning Economy
- Interoperability
- Sense of Presence
- Immersive
- Interconnected Spaces


Metanomics

Metanomics

The rapidly accelerating pace of Metaverse growth can be seen through the increase in spend across different industry segments spanning 2020, 2021, and now currently in 2022; alongside predictions through 2024.



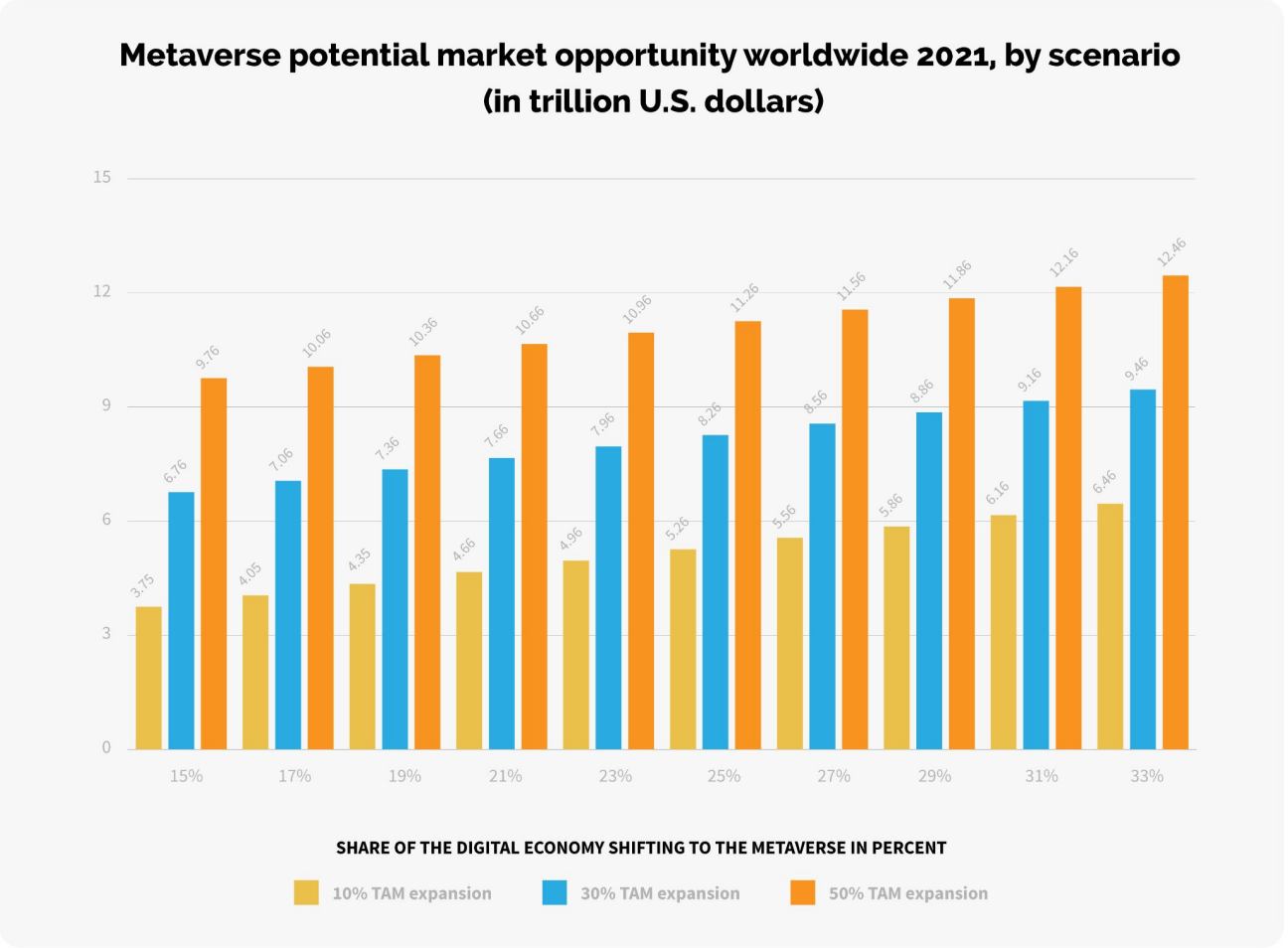
Metanomics

Potential Market Opportunity

There is large potential market opportunity globally as we shift from the digital economy to the Metaverse economy.

Despite trillions of dollars in Metaverse potential market opportunity globally, current labor market data is not depicting an increase in demand.

Consequently, it appears that market opportunity is not translating to job opportunity, resulting in an insufficient push for workers getting trained and acquiring necessary skills.



Sources: Goldman Sachs; World Bank; United Nations © Statista 2022
Additional information: Worldwide; Goldman Sachs; 2021

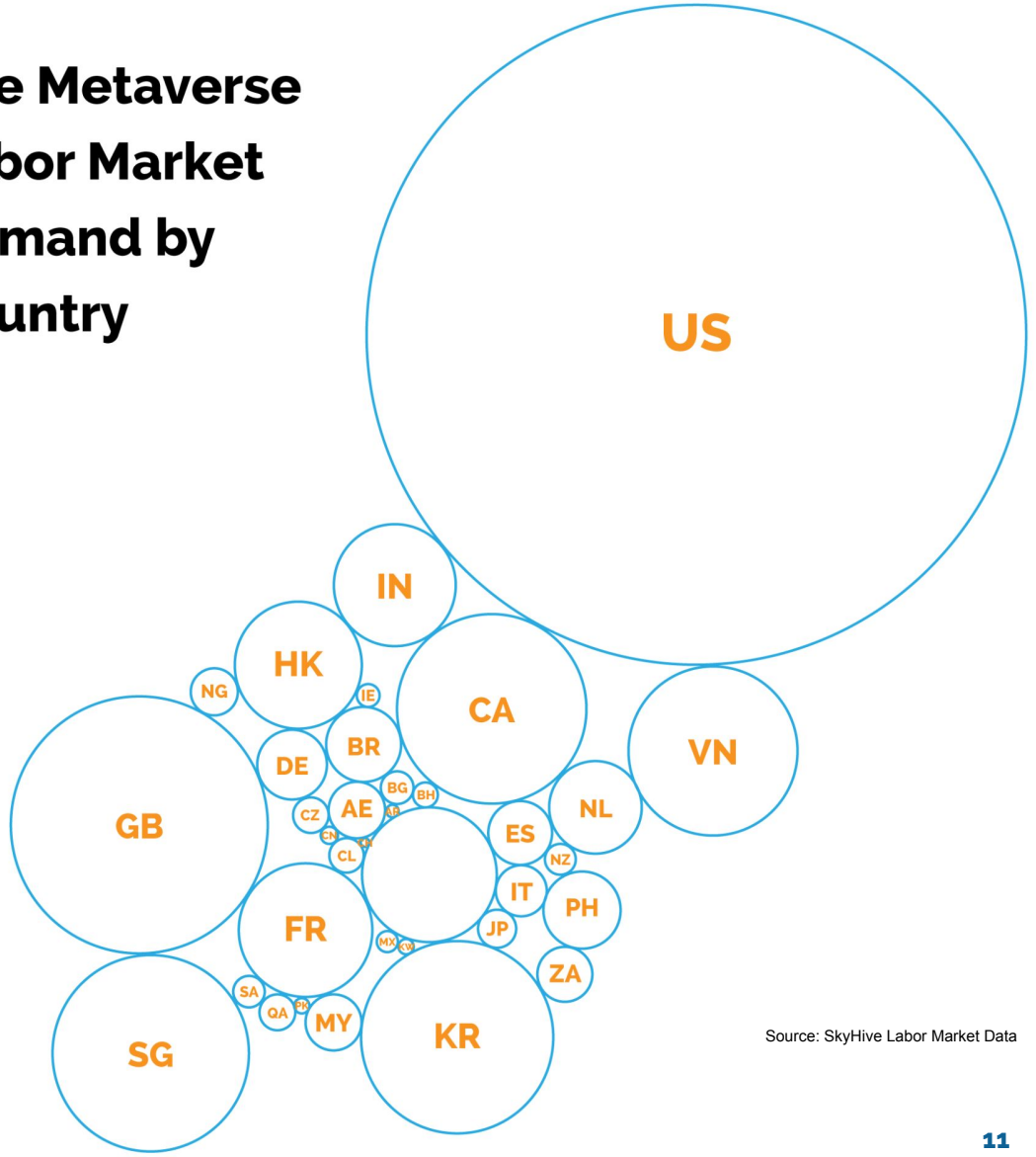
Metanomics

Global Labor Market Demand

While there is unprecedented growth in projects related to the Metaverse, the current global labor market is not accurately reflecting the full picture. It's critical that global business leaders leveraging human capital management (HCM) technologies understand the scope of the Metaverse's impact on workforce planning activities and skills needed to succeed.

The U.S. leads the way in Labor Market Demand for Metaverse-related workers and skills, followed by the United Kingdom, Canada, South Korea, Singapore, and Vietnam.

The Metaverse Labor Market Demand by Country



Source: SkyHive Labor Market Data

Metanomics

Lagging Demand

Current supply and demand demonstrates that potential market opportunity and growth in the Metaverse activity is not yet reflected in the global labor market.

This could be because specific jobs are hidden categorically, obscured behind broader sectors such as gaming or AR/VR. As the Metaverse industry expands rapidly, accurate and real-time labor market data is needed to depict true supply and demand.


Pioneers of the
Metaverse

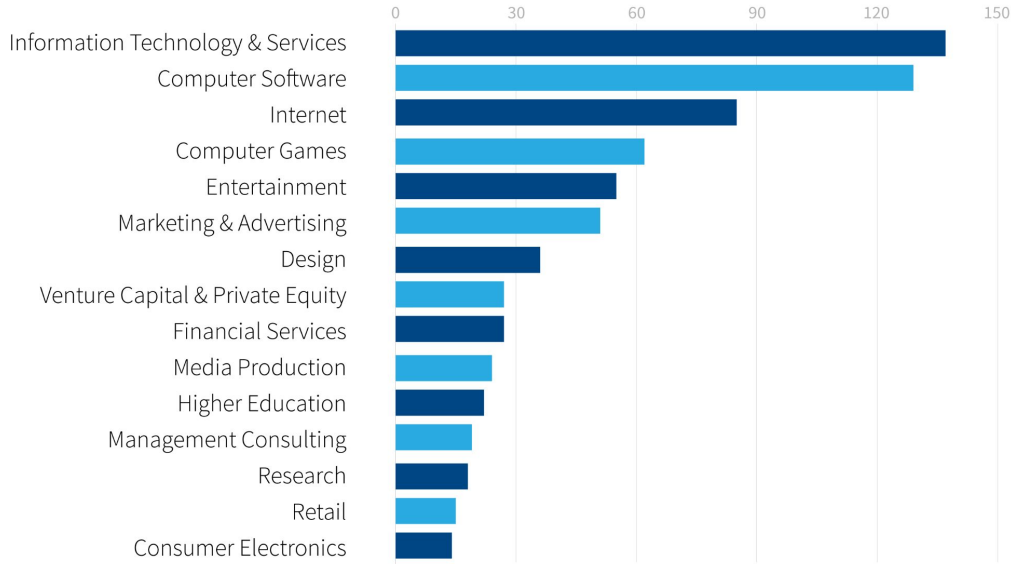
Pioneers of the Metaverse

Top Industries

The top industry venturing into the Metaverse is Information Technology & Services, followed by Computer Software, Internet, Computer Games, and Entertainment.

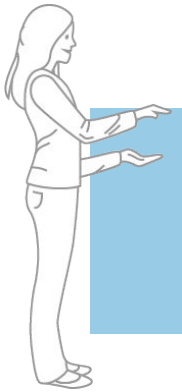
However, out of 50 industries identified using our technology, many unexpected sectors also fall on the upper half of the industries entering the Metaverse including Financial Services, Higher Education, Management Consulting, and Research.

Top 15 Industries Entering the Metaverse

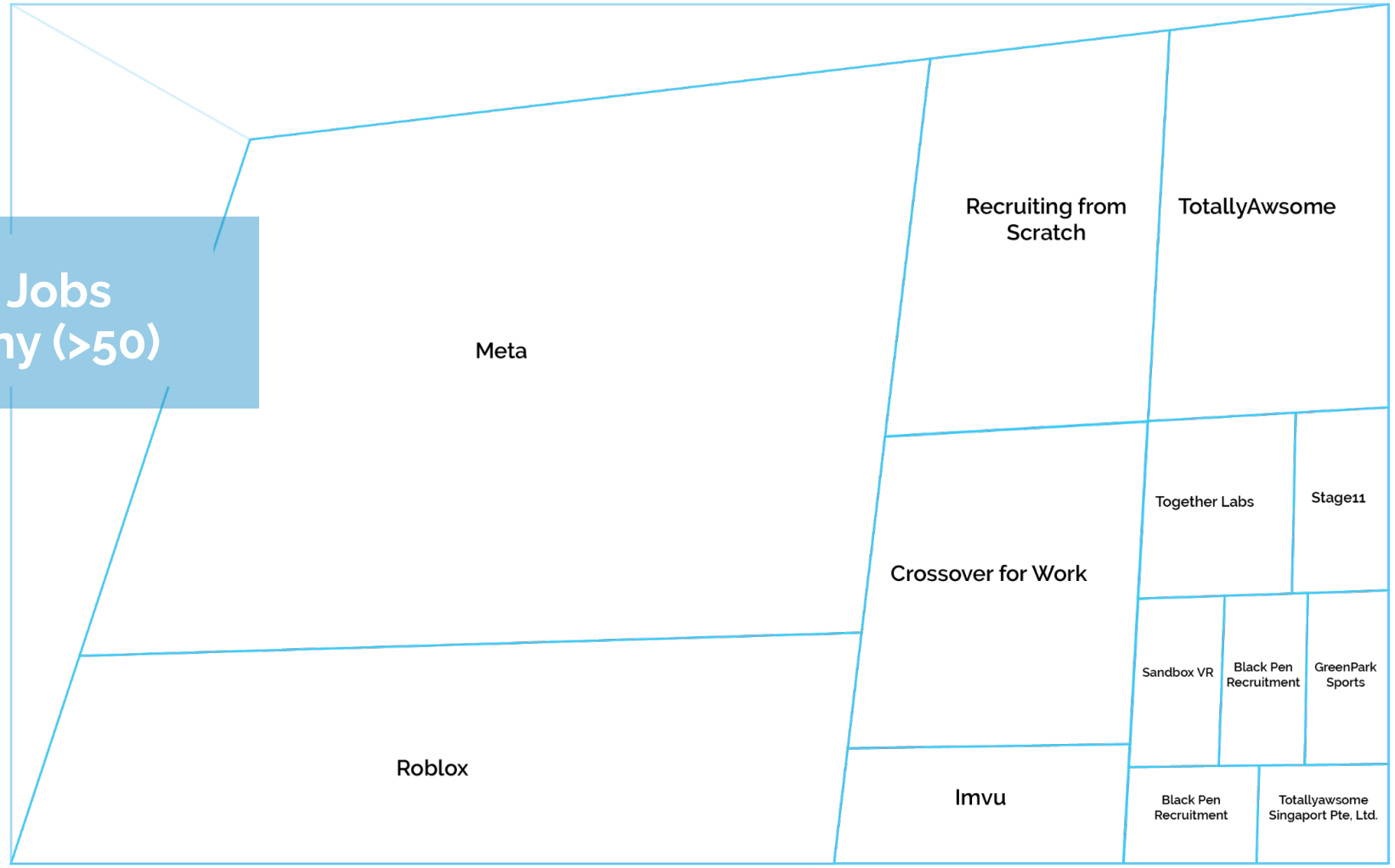


Other Industries Entering The Metaverse

- Animation
- Arts & Crafts
- E-learning
- Education Management
- Nonprofit Organization Management
- Telecommunications
- Writing & Editing
- Computer Hardware
- Consumer Services
- Fine Art
- Motion Pictures & Film
- Music
- Public Relations & Communications
- Real Estate
- Apparel & Fashion
- Events Services
- Food & Beverages
- Human Resources
- Insurance
- Performing Arts
- Sports
- Electrical & Electronic Manufacturing
- Hospital & Health Care
- Health, Wellness & Fitness
- Investment Banking
- Photography
- Professional Training & Coaching
- Staffing & Recruiting
- Architecture & Planning
- Automotive
- Aviation & Aerospace
- Construction
- Defense & Space
- Law Practice
- Market Research



Metaverse Jobs by Company (>50)



The growing list of traditional companies building Metaverse capabilities today demonstrate that advanced technology companies are not alone in building Metaverse-ready capabilities within their workforces.

Companies Entering the Metaverse

HARDWARE	SOFTWARE	SOCIAL MEDIA	GAMING	MEDIA & ENTERTAINMENT	RETAIL
Acer	Adobe	Meta	Activision	Live Nation	Balenciaga
Facebook	Ansys	Tencent	Arts	Sports Teams	Burberry
HP	Autodesk		Blizzard	Theme Parks	Gucci
Lenovo	Unity		Electronic		Louis Vuitton
Logitech	Unreal		Epic Games		Nike
Microsoft			Microsoft		Ralph Lauren
NVIDIA			NetEase		Tommy Hillfiger
Razer			Rolobox		Vans
Sony			Tenecent		Walmart
Valve			Valve		Zara

Source: SkyHive

SkyHive

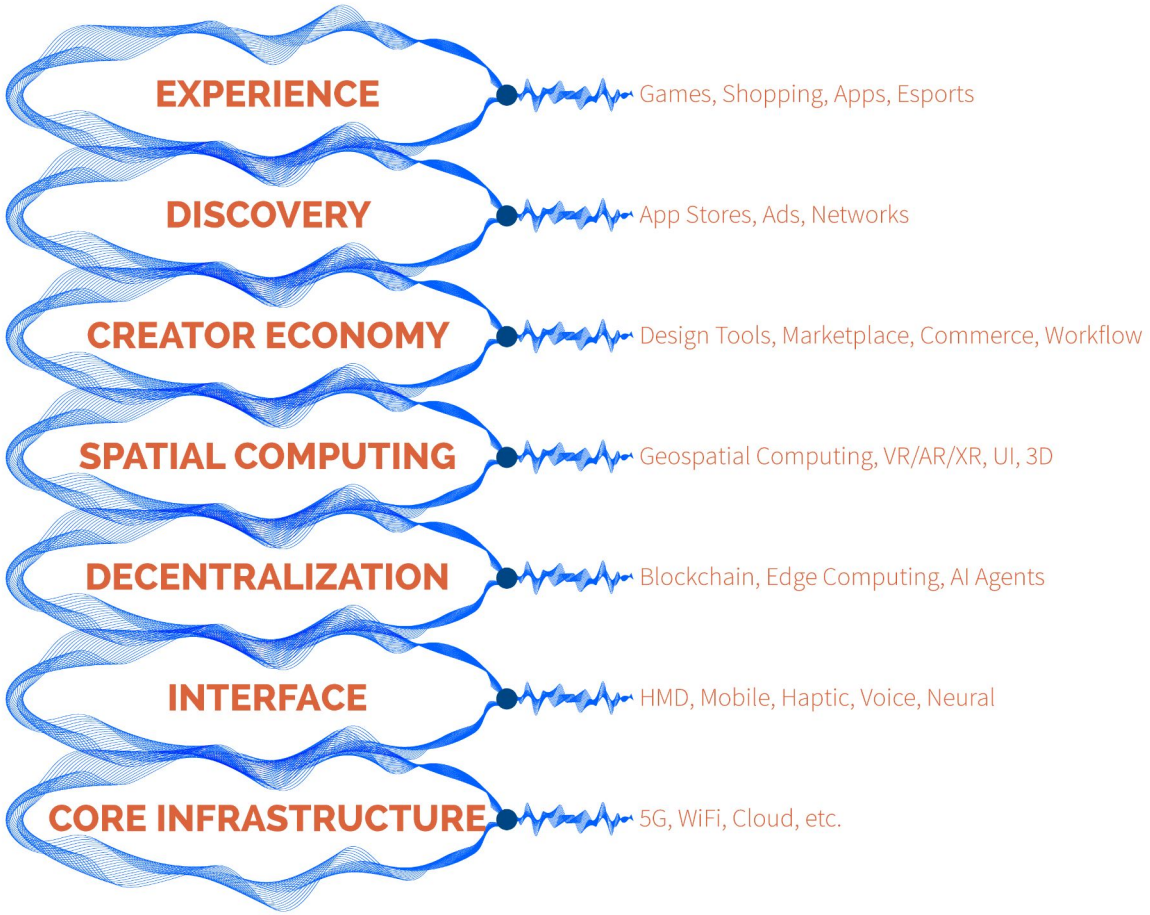

Metaverse
Layers

Metaverse Layers

The Metaverse can be categorized into seven layers with unique challenges and opportunities for employers, workers, and investors.

The layers provide a structural way of thinking about and building upon the Metaverse.

Each layer can help better conceptualize what is needed for Metaverse readiness and in the Metaverse, from infrastructure to apps, to a functional ecosystem.



Credit: John Radoff Metaverse Layers

Metaverse Layers

Experience & Discovery

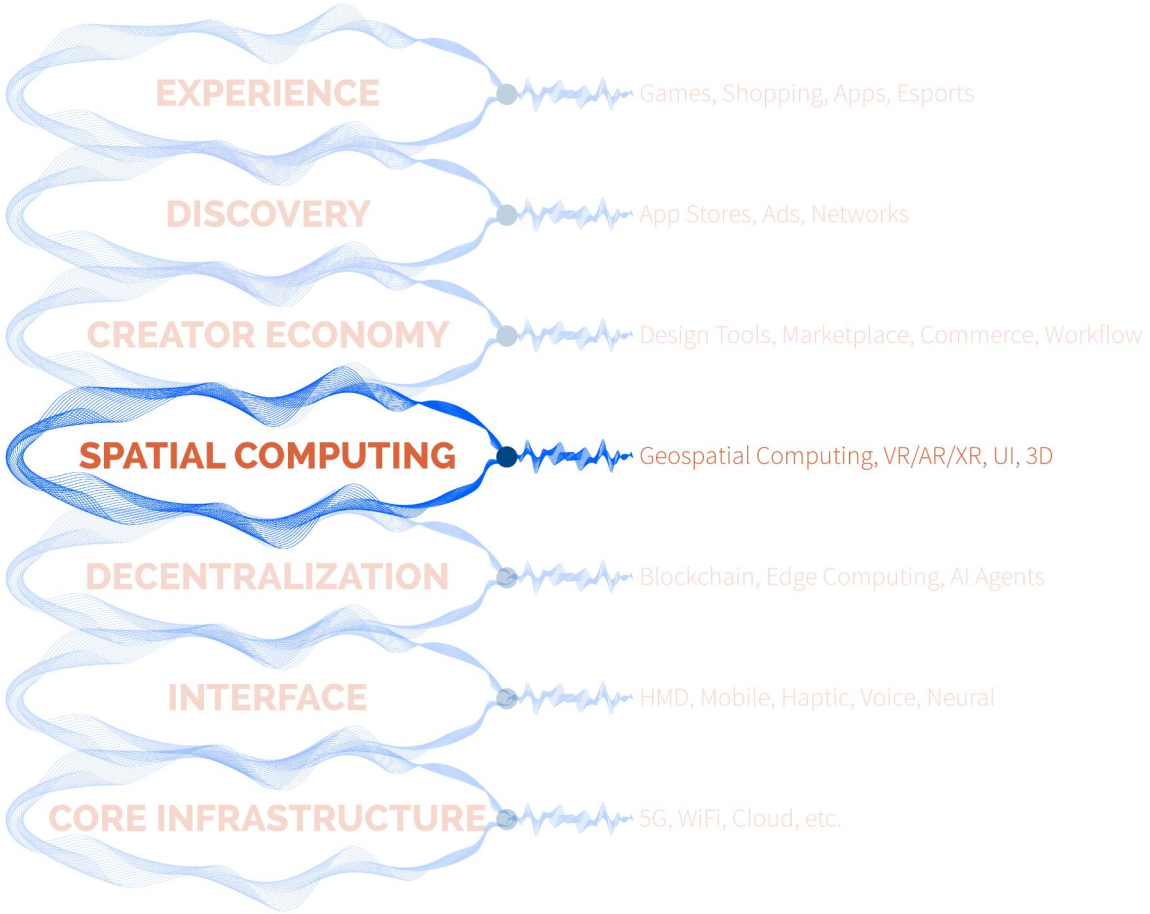
The experience and discovery layers are how people are already experiencing the Metaverse—shopping, gaming, engaging with content, and building or participating in immersive worlds—and discovering new experiences through information-sharing and marketing systems.

Credit: John Radoff Metaverse Layers

Metaverse Layers

Computing & Technology

Metaverse is the world that surrounds us and is going to be everywhere. It requires planet-scale infrastructure and simulation capabilities—and requires jobs and skills mainly in the areas of Hardware Infrastructure, Network, Edge/Cloud. Additional areas being affected include Computer Vision, AI, Blockchain, Robotics, and IoT.

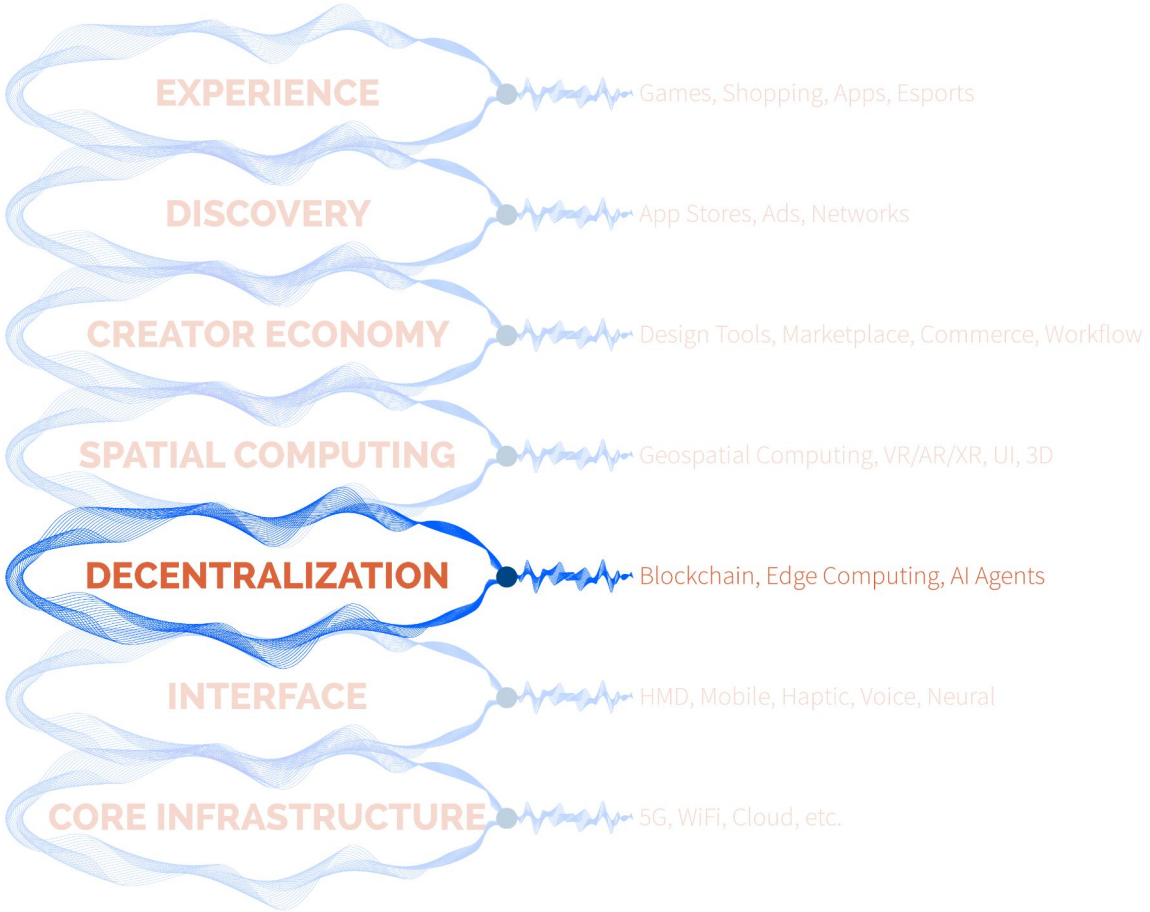


Credit: John Radoff Metaverse Layers

Metaverse Layers

Decentralization

Metaverse is paving the way to a decentralized web. Having an interoperable, open-source public chain will be essential for ensuring that various virtual worlds can interlink and overlap each other in a seamless way. Blockchain offers digital proof of ownership for assets in the Metaverse and core carriers of the Metaverse digital economy are decentralized finance (DeFi) and non-fungible tokens (NFTs).



Credit: John Radoff Metaverse Layers

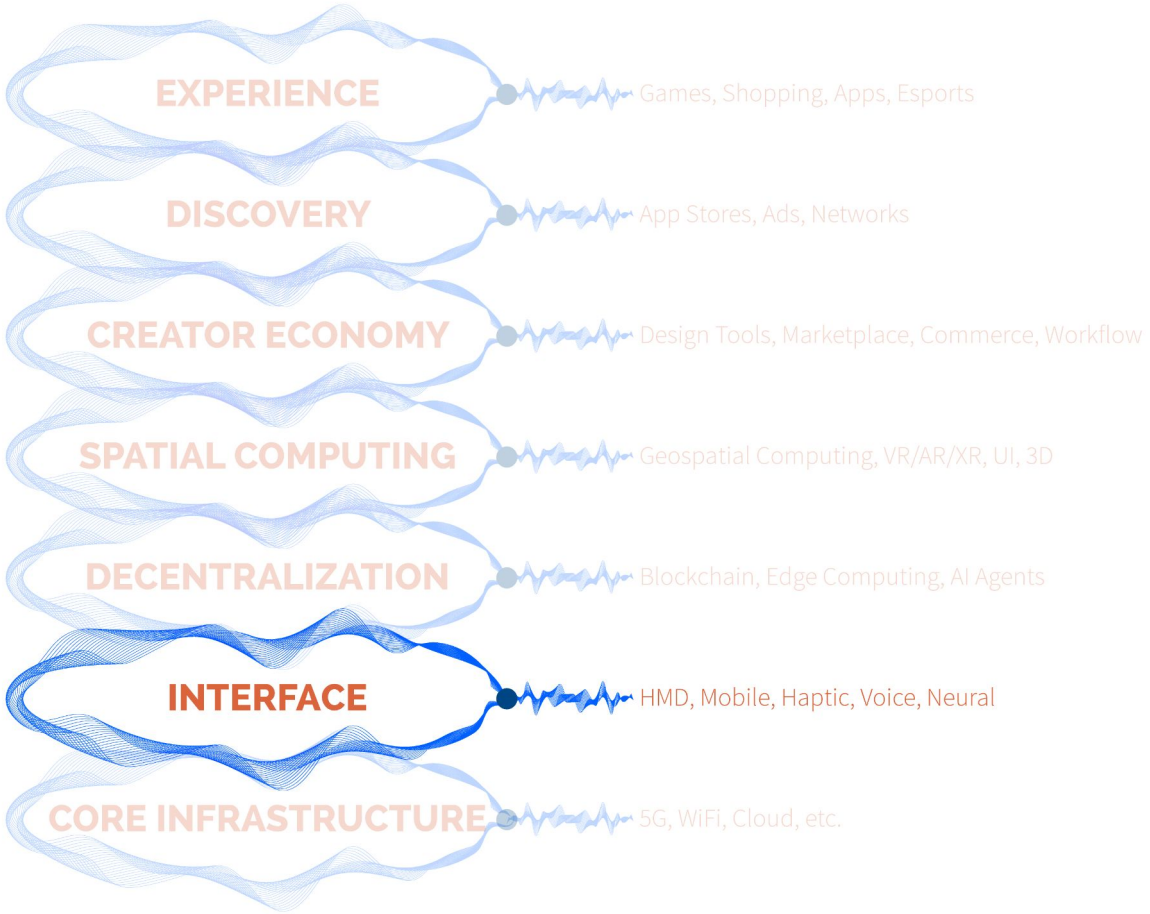
Metaverse Layers

Interface

We are seeing a deluge of new platforms with immersive technologies, collaboration systems, eye-tracking technology and facial tracking, biometrics, and brain-control interfaces.

Non-intrusive Human Computer Interface (HCI) technologies are needed to enable breakthrough AR glasses and VR headsets; including optics and displays, computer vision, audio, graphics, brain-computer interface, haptic interaction, and eye/hand/face/body tracking.

The interface layer requires faster emergence of perception science and related jobs. The Metaverse will evolve to incorporate anything display capable.

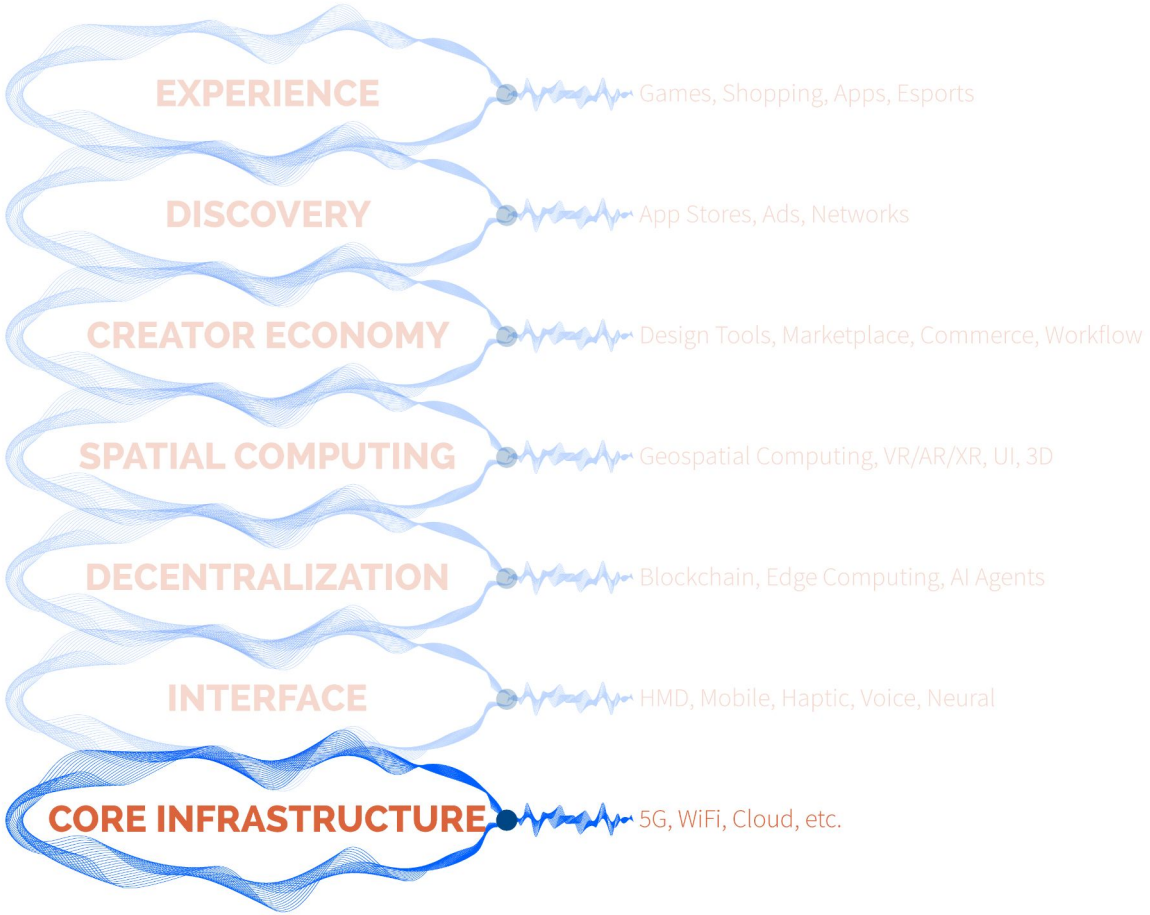


Credit: John Radoff Metaverse Layers

Metaverse Layers

Core Infrastructure

Interactive 3D Metaverse requires systems to be built with textured media from video and audio. These require peak upload and download network speeds. Growing access to 5G can support the ongoing development of the Metaverse by providing the speed and power that make it possible for digital worlds to function. The Metaverse presents an unprecedented opportunity for the connectivity industry and needs significant advancements in network speeds, network latency, and speeds to achieve consistent quality of experience. Apart from regular 5G jobs, we see an increase in specialist 5G Mobile Edge Computing jobs—both on applications and at network level. Some of these jobs will include AR/VR Product Quality Engineering and Cellular Firmware Engineering.



Credit: John Radoff Metaverse Layers

Metaverse Layers

Skills Needed By Layer

Using our labor-market analysis and proximity analysis of specific areas like gaming development and 3D interface development, we can pinpoint specific skill demand emerging in relation to individual Metaverse layers including interface, spatial computing, and more.

Applications/End-Users

By taking a closer look at the Metaverse layers, we can see how the global Metaverse will affect jobs and skills needed across many areas including retail and commerce, advertising, networks, design, marketplace, computing, and more. By looking more closely at each Metaverse layer, we can see the rapid pace at which many industries are being impacted.

INTERFACE SKILLS	COMPUTING SKILLS	APPLICATIONS/END-USERS
3D Deep Learning	3D Rendering of Real-time Physically Accurate Simulation	Aerospace and Defense
Advanced Real-time Rendering	3D Rendering of Virtual Collaboration	Content Creation
Character Animation	AI Agents	Education
Face Tracking	AI Assistants	Fashion
Full Body Capture	Commerce Engines	Gaming
Full Body Tracking	Deep Learning	Media and Entertainment
Human Performance Capture	Digital Twins	Others
Image and Video Manipulation	Geospatial Computing	Retail
Material and Lighting Capture	Human Factors	Social Media
Mesh Deformation and Geomtery Processing	Real-time Physics Simulation	
Neural Rendering	Real-time Ray Tracing	
Physics Based Simulation	Real-time Data from IoT Devices	
Real-time Facial Animation	The AI as a Creative Collaborator	
Volumetric Capture	Virtual Beings	
	Physics Based Simulation	
	Real-time Facial Animation	
	Volumetric Capture	

Metaverse Applications

Arium - Virtual social experience platform for architects, curators, and artists

Atlantis - Virtual World, Web 3 Social Metaverse

Atta - Entertainment Metaverse

Bloktopia - Decentralized Metaverse built and backed by the Polygon Network

Bullieverse - Open Metaverse

Cryptovoxels - Virtual World for stores and art galleries on Ethereum Blockchain

Decentraland - Platform enabling users to be a part of a shared virtual world. Virtual ecosystem where users can buy or sell digital property, play games, exchange collectibles, socialize, interact, and explore

Metafactory - 'Digiphysical' goods that connect multiple worlds via NFTS and embedded microchips

Metamall - Social shopping

Metaring - Unique wearables and digital collectibles

Metaverse Property - World's first virtual real estate company

Momentum - Metaverse stack for Web3 communities

NFTworlds - 10,000 virtual worlds on the Ethereum Blockchain

Nifty Island - Open social gaming platform

Portals - Browser-based Metaverse

RareRoom - Custom virtual spaces

Ready Player Me - Cross-game Avatar platform

Somnium Space - Virtual World

Space - Immersive commerce without any barriers

Spatial - Platform for creators and brands

SuperWorld - Virtual World where users can buy, sell, or curate 64B unique plots of virtual land

Terra Virtua - Immersive collectibles platform

The Fabricant - Platform where anyone, anywhere can become a digital fashion creator and participate in the digital fashion economy. By 2025, 100 million people will be Metaverse-ready by wearing digital garments minted in The Fabricant Studio

The Sandbox - Virtual World to build games

Upland - Property trading Metaverse connected with real-world addresses

Wallmeta - Virtual shopping

Wilder World - Immersive 5D Virtual World


Skills and Jobs
of the Metaverse

Skills and Jobs of the Metaverse

Many jobs and skills are emerging based on current and emerging in-demand jobs.

However, there is a massive skills gap and the labor market still needs to catch based on the economics of the Metaverse.

We pulled the top in-demand Metaverse skills using real-time, comprehensive future-skills analysis from SkyHive's Quantum Labor Analysis Platform. Future-skills predictions enable individuals, companies, and communities to take a deeper look at what's needed to prepare for the future world of work.

Top Metaverse Skills

TECHNICAL SKILLS	CREATIVE SKILLS	BUSINESS SKILLS	MARKETING SKILLS	SOFT SKILLS
Artificial Intelligence	Adobe	Business Development	Advertising	Business Intelligence
Augmented Reality	Animation	Business Modeling	Channel Partner Development	Creative Direction
Bitcoin	Creative Fiction	Business Planning	Communications	Critical Thinking
Blockchain	Creative Services	Business Strategy	Digital Journalism	Cross-functional Team Leadership
Cloud Computing	Creative Strategy	Competitive Analysis	Digital Marketing	Entrepreneurship
Computer	Design	Consulting	Marketing	Futurism
Cryptocurrency	Fashion Design	Corporate Communications	Media Relations	Relationship Management
Development	Film Production	E-commerce	Product Marketing	Futurism
Digital Compositing	Film Analysis	Event Planning	Public Relations	Message Development
Game Design	Fine Art	Financial Modeling	Social Media	Storytelling
Interaction	Flash Animation	Financial Structuring	Storyboarding	Strategic Communications
Internet of Things	Graphic Design	Fundraising		Writing
Microsoft Office	Interior Design	IM&A		
Numpy	Motion Design	Management		
Python	Music	Market Research		
Robotics	Photography	Merchandising		
Rotoscoping	Photoshop	Production		
Software	Production	Project Management		
SQL	Screenwriting	Qualitative Research		
System Architecture	Soundtrack	Research		
Virtual Reality	Typography	Sales		
	Videography	Strategic Forecasting		
		Training		
		Trend Analysis		

Source: SkyHive

SkyHive

Skills and Jobs of the Metaverse

Top Technical Jobs in the Metaverse

Inside the Metaverse, jobs and career pathways are beginning to crystallize. Soft skills, technical proficiencies, and communication capabilities provide an entryway to careers in the Metaverse industry outside of traditional skill requirements for computer science and engineering roles.

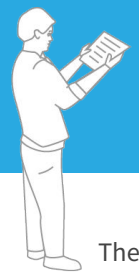
The figure on the right depicts top technical jobs currently needed for Metaverse readiness.

Skills and Jobs of the Metaverse

Top Non-Technical Jobs in the Metaverse

Inside the Metaverse, jobs and career pathways are beginning to crystallize. Soft skills, technical proficiencies, and communication capabilities provide an entryway to careers in the Metaverse industry outside of traditional skill requirements for computer science and engineering roles.

The figure on the right depicts top non-technical jobs currently needed for metaverse readiness.



Future Jobs & Skills of The Metaverse

These are the future jobs and skills that will emerge and be needed in the Metaverse.

Metaverse Scientist

- Advanced Computer Vision
- Intelligent Content Creation
- AI Agents

Metaverse Planner

- Planning for virtual worlds
- Business cases
- SaaS/PaaS

Ecosystem Developer

- Coordination with partners, governments, and communities
- Cross-functional skills

Metaverse Safety Manager

- Guidance and oversight
- Regulatory safety requirements
- Content moderation

Metaverse Hardware Builder

- New HMDS
- Sensors and cameras
- Complex consumer electronics

Metaverse Story Teller

- Advanced Computer Vision
- Intelligent Content Creation
- AI Agents

World Builder

- Guidance and oversight
- Regulatory safety requirements
- Content moderation

Metaverse Cyber Security

- Prevent NFT theft
- Prevent fraud, hacking avatars
- Prevent data leaks

Metaverse Privacy

- Sensor data privacy
- Advanced privacy standards

Metaverse Lawyer

- New liabilities
- Contract Law

Metaverse Financial Analyst

- Tokenomics
- Market place

Metaverse Neuroscience

- Connecting the optic and vestibulocochlear nerves and allow data to translate the meta-reality to the brain directly as if we really saw and heard the simulated world

Source: SkyHive Labor Market Data

Next Steps

Next Steps

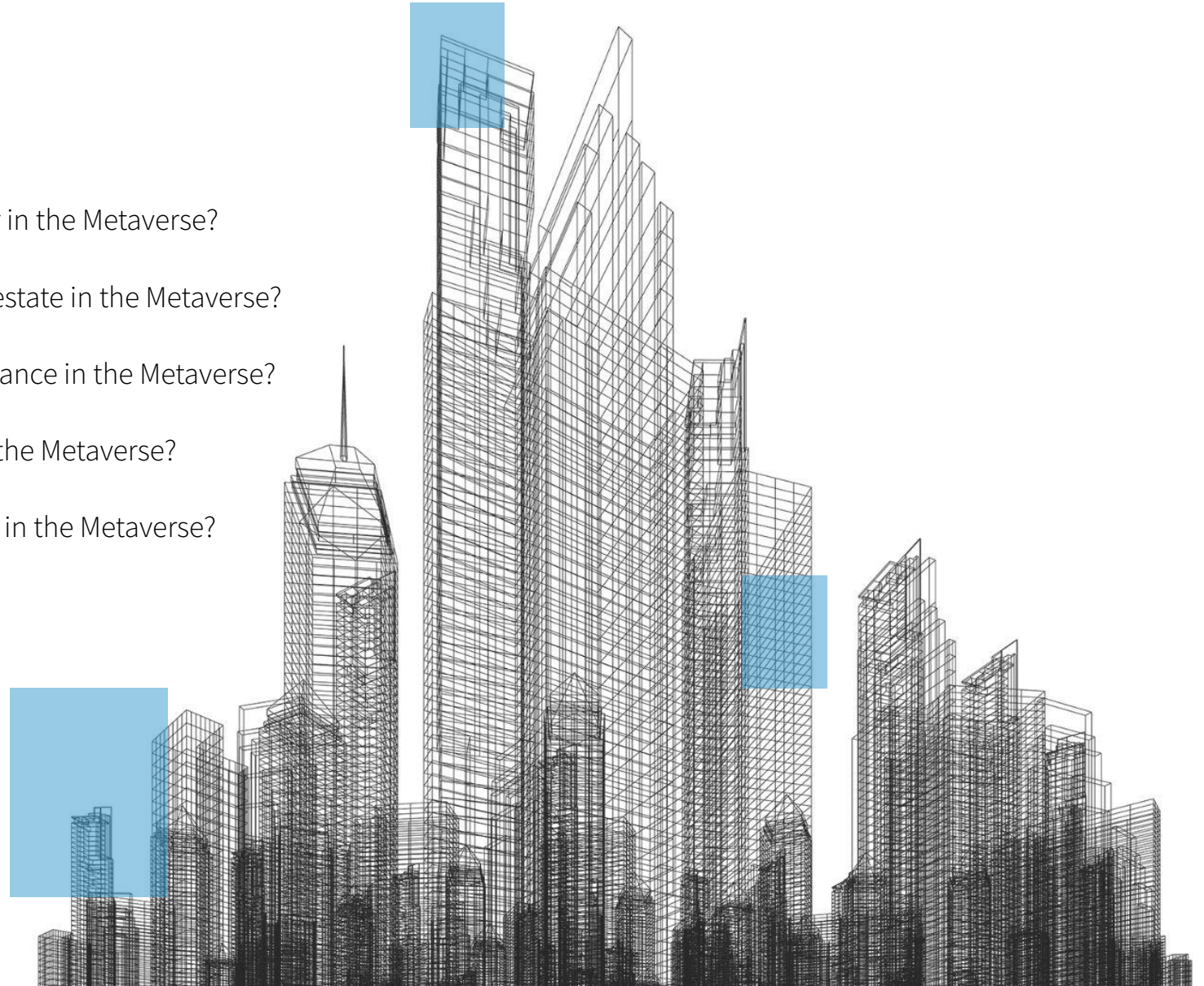
What skills are needed for a lawyer in the Metaverse?

What skills are needed to sell real estate in the Metaverse?

What skills are needed to sell insurance in the Metaverse?

What skills are needed to teach in the Metaverse?

What skills are needed for banking in the Metaverse?



Next Steps

Metaverse Courses & Learning Content

Metaverse technologies should result in increased demand for skilled workers who know how to use technology to enhance workplace productivity.

Several universities started to incorporate *Metaverse, Virtual and Augmented* reality into their curriculum. Notable of them is Stanford's *Visions of the Future: Artificial Intelligence, Cryptocurrency, the Metaverse, and Beyond.* Along with universities there are few online courses that are emerging, however there aren't many given the potential and proliferation. Here are few online courses:

- Coursera
- Digital Fashion Reality
- Virtual Reality Specialization
- Udemy
- Metaverse Masterclass — Learn Everything about the Metaverse!
- Metaverse: Learn the Facts behind the "Metaverse" Fad
- Metaverse, Blockchain, Investment, NFT, Digital wallet, Digital ID, VR, AR, Digital Twin: Future
- Virtual Real Estate Investing in the Metaverse
- Blockchain Council
- Certified Metaverse Expert

Next Steps

Metaverse Readiness

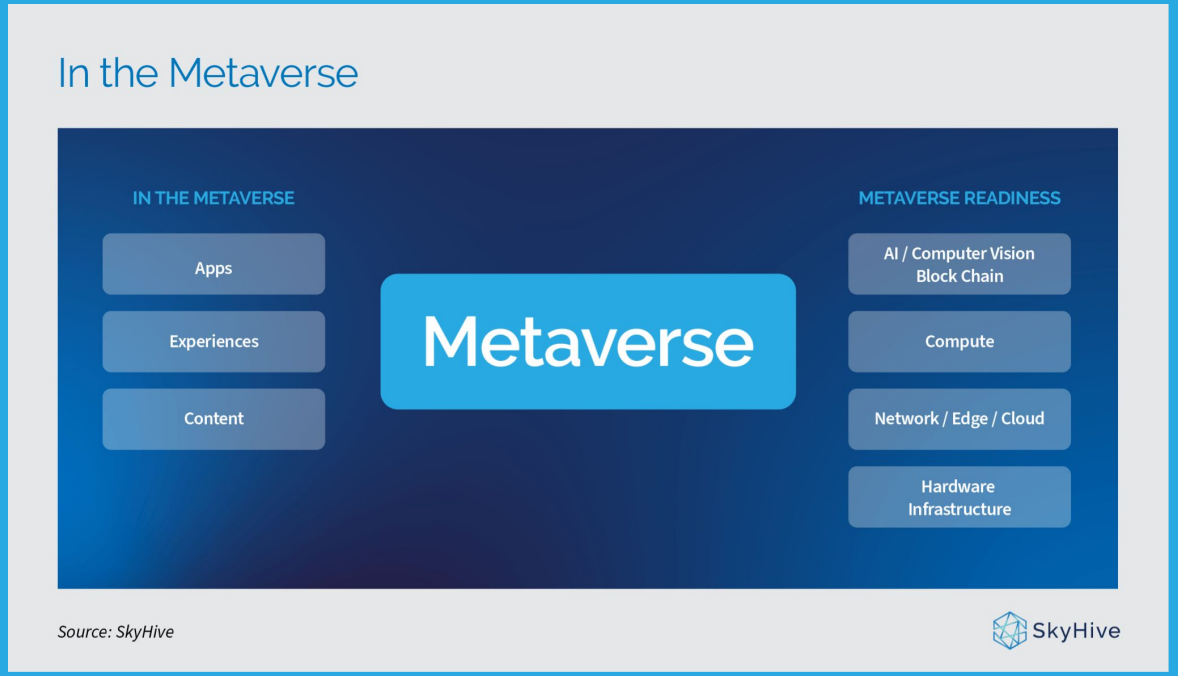
While we are still in the early stages of the Metaverse, the labor market has proven slow to adapt for Metaverse readiness. The number of jobs and variety of skills needed are exceptionally low compared to the market opportunities, paired with an inadequate amount of learning content and courses available to support Metaverse career paths. This poses significant challenges which require careful evaluation and ample support from emerging jobs and skills.

The Metaverse will transform the data security and payments industries. Actual and digital currencies will connect to enable fast and effortless exchange, reputation and identity will differ significantly from their real-world counterparts, new verification methods need to be developed, and data security and privacy will need to evolve substantially. New regulatory policies and security measures will unlock an abundance of security and privacy jobs, and a new breed of skills and competencies must be rapidly developed to tackle these critical security and privacy issues.

Next Steps
In the Metaverse

What's going to happen when the real and digital landscapes converge? While we can predict what's needed for Metaverse readiness, a blank page still exists in the Metaverse.

The most substantial challenge may be ensuring users are secure and protected while engaging in trade within the Metaverse. This requires Metaverse-specific law and jurisdiction related to identity and ownership rights, permeating between real and virtual worlds. As the Metaverse continues its rapid expansion, many industries and roles will be significantly disrupted and reimagined — and consequently, so will the global labor market and our approach.



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