

WHITEPAPER

Metaverse
Beyond the Hype:
Architecting New
Business
Opportunities for
Enterprises and
Individuals



Abstract

The face of commerce is changing with the onset of 5G. We have seen this amply in the past - 2G spawned phone commerce (IVR based), 3G - web commerce, 4G- app commerce. 5G will usher us into an era of meta-commerce. Meta-commerce is more immersive, resonates well with digital natives and leverages Web3 technologies and blockchain. On one hand, we are already hearing about growing rates of cart abandonments in current ecommerce avenues. On the other, early reports suggests that 70% of customers who have shopped in metaverse have bought something.

The metaverse is here to stay and generate incremental business value for enterprises and individuals alike. As service providers, we have a critical role in leading the adoption of metaverse among global brands spread across diverse geographies by generating business ROI at affordable price points.

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Rise of the 'Metaverse' - Evolving Consumer Preferences

In the last couple of years, there have been significant adoption of augmented and virtual realities (AR/VR) due to increasing demand by consumers towards a superlative UI/UX driven channel of communication compared to the traditional mails/chatbots/phone-based interactions. On the commerce side, industry research suggests that the websites and portals built on Web 2.0 technologies (centralized frameworks) have been challenged by as high as **85% cart abandonment rates** while **70% of the consumers who have visited the metaverse** have ended up completing the transaction, thereby making a purchase. Key factors responsible for this trend include:

Privacy Concerns

Concerns related to threat to privacy and confidential information on these Web 2.0 based portals and apps based on centralized architectures. For example, sharing credit card information for completing the transaction

Tech-Savvy Millennial and GenZ Population

Greater preference of shopping in immersive, 3D environments by millennials and GenZ who have grown up playing 3D games like Fortnite and Minecraft

It is expected that the metaverse (AR/VR) market will grow exponentially in the next 3 to 5 years. In essence, younger tech-savvy population with a bias for immersive experiences in their daily lives - from information assimilation about products and services to making purchase decisions combined with business benefits that the technology offers will ensure that the market continues to grow in the future with adoption trends only increasing year-on-year.

Top Use Cases Adopted by Global Brands

In addition to adoption by individuals, there has been a greater adoption by enterprise brands which in turn is contributing to greater market for AR / VR based experiences. Several brands are coming up with experiences in metaverse for their customers including:

Disney - In December 2021, Disney filed a patent for a "virtual-world simulator," which reproduces one of the company's theme parks into a 3D realm. Users could then move in "highly immersive individualized 3D virtual experiences without requiring those users to wear an augmented reality AR viewing device

Hyundai - In Oct 2021, Hyundai Motor Company launched Mobility Adventure, a metaverse space on Roblox (the gaming platform) featuring Hyundai Motor's products and future mobility solutions. The collectively shared virtual space lets users meet and experience Hyundai's mobility offerings and customize their avatars.



Nike - Nike wants to leverage Metaverse for selling its sneakers. Recently, it filed seven new trademark applications that indicate its intent to produce and sell Nike-branded virtual footwear, apparel, and accessories for use in virtual environments.

Warner Bros Pictures - In 2021, Warner Bros. Pictures hosted a virtual party on Roblox to promote the summer film "In the Heights." The block party brought the music, dance, and Latin American culture of the film's iconic Washington Heights neighbourhood to the Roblox metaverse

Louis Vuitton - To celebrate the founder's 200th birthday, Louis Vuitton released Louis: The Game, a video game that follows Vivienne, a mascot created by the brand monogram, as she traverses the virtual world and journeys to vibrant locations across the globe in search of collectible NFT candles. Each candle unlocks a story about the journeys of Louis and his family. Players can collect 30 NFTs, including 10 by Beeple, the artist whose digital collage sold as an NFT at a Christie's auction for \$69.3 million.

Samsung - In January 2022, Samsung launched its first metaverse store in Decentraland. Samsung 837x is modelled after the physical store at 837 Washington Street, New York City. Since its opening, Samsung's digital store has received over 120,000 customers. Initially, Samsung 837x was a store where users could stop by and browse collections or take on quests. Today, Samsung revamped 837x for a more immersive experience—users can build their own adventure, interact with other in-game characters, and accomplish missions.

Several other leading brands are leveraging use cases built on metaverse for different business objectives including improving brand recall, enhanced customer experience and providing an alternative sales channel to the traditional websites/portals/apps

Current Challenges and Recommended Approach

In our conversations with clients, they are excited to learn more about the metaverse and how it can lead to desired business outcomes focused on superlative customer experience, new customer acquisition, generation of new revenue streams, and brand building. However, there is still limited understanding about the technology per se and applicable use cases tailored for their business or industry.

Clients are still struggling to fully appreciate that the metaverse is much more than mere 'experience' layers which meet the eye but also delves deeper into other equally important layers like infrastructure, human experience interface, spatial computing, content creator economy, industrial digital twins, and monetization.

We, at TechM, focus on bringing forth this differentiation across our discussions and project implementations for our clients as it has a direct impact on ROI visibility and enables them to not only meet desired business objectives but surpass them. To fully appreciate the scope of metaverse and how it can impact enterprises' businesses, we advocate dividing metaverse into seven (7) layers as outlined in Figure 1.

We operate across all 7 layers of the metaverse



Layer	Our Play Area
EXPERIENCE Games, Shopping, Social, Retail	Avatar as a Service, Meta Environment Creation
MONETIZATION Advertising, Commerce, Marketplaces, Stores, Agents	NFT & Commerce Management, Revenue Optimization (Experience Support Services)
CONTENT – CREATOR ECONOMY Design Tools, Asset Market, Commerce, NFTs	Content Moderation, Relevance & CSAM
SPATIAL COMPUTING 3D Engines, AR/VR	Geographic Information Systems (GIS)
SOFTWARE + IOT Edge Compute, AI Agents, Blockchain	Digital Twins, AI Chatbots
HUMAN EXPERIENCE INTERFACE Mobile, Smart Glasses, Haptic, Voice, Neural	Device Development, Optimization & Testing
INFRASTRUCTURE 5G, WIFI, Edge, Hardware	Cloud, 5G & Network Optimization Services

Figure 1: The 7 Layers of the Metaverse

This provides a holistic view on the key building blocks of metaverse and how they combine to elevate the customer experience. The layered approach further helps in defining the use cases that may be of most relevance to client's business objectives.

Another critical challenge which requires immediate focus is the high cost of head mounted displays and other haptic devices. While in US and other mature markets, the brands and individuals may still have the purchasing power but in Asian and African markets, the adoption of VR driven metaverse experience will be curtailed due to high price points of these devices. In fact, come to think of it, the pandemic and other global economic factors have influenced the spending power of businesses globally off late.

Despite billions of dollars being poured into development, true AR glasses are still nowhere near high-end glasses in terms of appearance, portability and are in fact bulky. The intent is to develop glasses that are comfortable to wear for long periods of time with seamless transition and interactions between virtual and real-world shifts. There are further challenges around building high-quality hardware that can achieve the right retina-display and pixel density for a realistic virtual immersion. Currently, the hardware manufacturers are also



working to develop newer models around facial and retina scans, voice recognition to prove your real identity in the metaverse and mitigate the challenges posed by bots that can mimic your appearance and avatar characteristics.

As a result, we need to be flexible and adopt solutions that help us resolve issues pertaining to high device costs while not compromising on customer experience.

This is where providing a superlative customer experience using a 'Web-and-Mobile-First' approach based on AR and mixed realities (MR) and backed by a robust infrastructure as foundation comes to the fore.

As service providers, we need to advocate our clients across geographies to leverage metaverse using web-based interfaces and smart phones without necessitating the need to use cost-prohibitive VR devices. This helps to manage costs better, offer superlative customer experience, and bring-in commerce capabilities using blockchain and NFTs. This leads to creation of new monetization opportunities and usher in a creator economy.

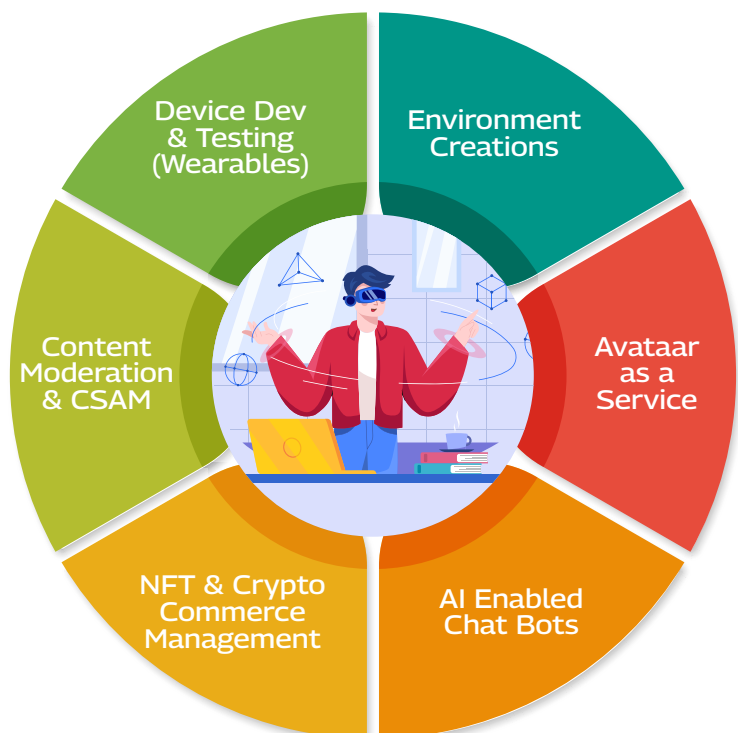
Opportunities in Metaverse – A Service Provider's Perspective

There are opportunities galore when it comes to identifying and conceptualizing pan-industry use cases. However, we need to identify a framework which segregates the key use cases and has acceptability and adoption across industries. One of the approaches is to consider a 'consumer' (B2B2C and B2C) and 'enterprise' (B2B) perspective, and identify core and allied services that will enhance business value for the users. Let us look at indicative services under this approach in Figure 2.

Consumer and Industrial Metaverse Ecosystem Key Services

Consumer

New layers of services being built with consumers at the center humanized experience, monetization, creator economy, and interoperability





Industrial

Taking Tech Mahindra's integrated capability mix with enterprise level implementations of digital twins++ making NXT.NOW™ possible

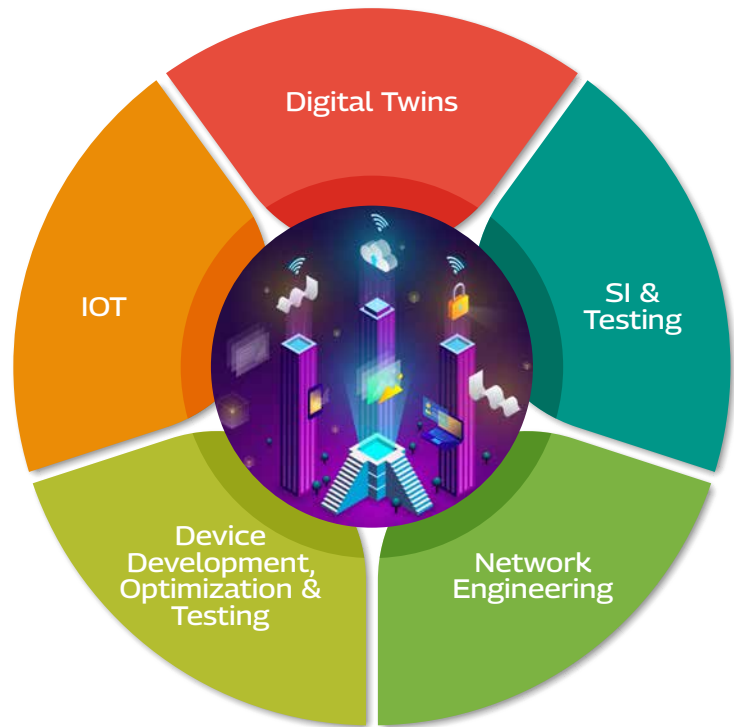


Figure 2: Consumer and Industrial Metaverse Ecosystems

In the set of services focused under consumer metaverse, we imagine the consumer to be at the center surrounded with a set of services, right from their entry in an immersive environment— to engaging in intelligent conversation using AI to enabling transactions through blockchain and NFTs— while ensuring that their personal identity and privacy is secured.

With respect to enterprise or industrial metaverse, we advocate on lending superpowers to assets and processes to visualize improvements in digital environments which are not possible in real environments as such updates in physical environments may be cost prohibitive and time consuming. These visualizations are built using data layers collected from IOT and connected devices that are essential to construct digital twins.

The endeavor should be to bring in interoperability for digital twins built in various protocols, consolidate them in metaverse, and create a single source of truth for rapid product development and shortened times to market.

Using both consumer and industrial metaverses, the service providers can offer differentiated experiences to end customers, create new revenues streams and optimize cost of asset and process ownership.

Way Forward - Into the Future

We are only at the tip of the iceberg - there is much to be unravelled to unleash the full potential of the technology across industries. In the future, I foresee widespread adoption of metaverse for futuristic use cases like complex surgeries, virtual travel (even space travel!), genome sequencing among other innovations.



As service providers at the forefront of this innovative technology, we need to synergize and adopt a collaborative solutioning approach that focuses on sharing best practices and solving a client's business problem rather than force-fitting the technology. The collaborative approach should lead to formulation of a design thinking roadmap for the enterprise customer that is aligned with their digital strategy. The technology, its benefits, and applicable use cases need to be identified and its potential impact on the business parameters assessed.

At TechM, we have partnered with leading companies like NVidia and other niche platform providers to offer an end-to-end solution for bringing the value-add over our clients' existing 'as-is' business model or sales strategy.

As part of our industrial metaverse offering focused on B2B industries, we offer digital twins and prototyping solution to our customers with the help of our partner NVidia. NVidia has a product called 'Omniverse' which helps with interoperability of different design file types and enables creation of a unified output in Unreal, Unity, and other technologies. Our combined approach and solutioning helps bring in several enhancements including performance monitoring and predictive analysis in the digital twins we create for our customers.

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