



QUALIVERSE, CROSSING THE QUALITY CHASM IN THE METAVERSE

It's time to plug into the meta moment

The meta moment is upon us. Touted to be the next disruptive technology, metaverse was a trend waiting to happen as digital experiences became more immersive, persistent, shared, and three-dimensional and tried to simulate the real world as much as possible. Also, the metaverse is not a new concept that has suddenly sprung up. In fact, the term "metaverse" traces its origin back to 1992 when author Neal Stephenson introduced it in his novel, Snow Crash, to signify digital avatars in virtual reality. From then on, spurred by digital-natives also known as Gen Z and increasingly sophisticated technologies, metaverse today is a reality.

What exactly is metaverse? It is a paradigm shift from the physical world as we know it to a digital universe that promises the same experience as in the physical arena. An army of apps available through various devices can make your brain experience the metaverse as if it were a physical or real universe. Technologies such as virtual reality (VR), augmented reality (AR), blockchain, social media and digital currency will shape the metaverse. Note that the metaverse is not an unwieldy monolithic structure – it is far from it. Simply put, it is a motley collection of different virtual worlds with its unique access, membership, monetization policies and own form of creative expression enabling individuals, creators and companies to deliver immersive, engaging and productive experiences.

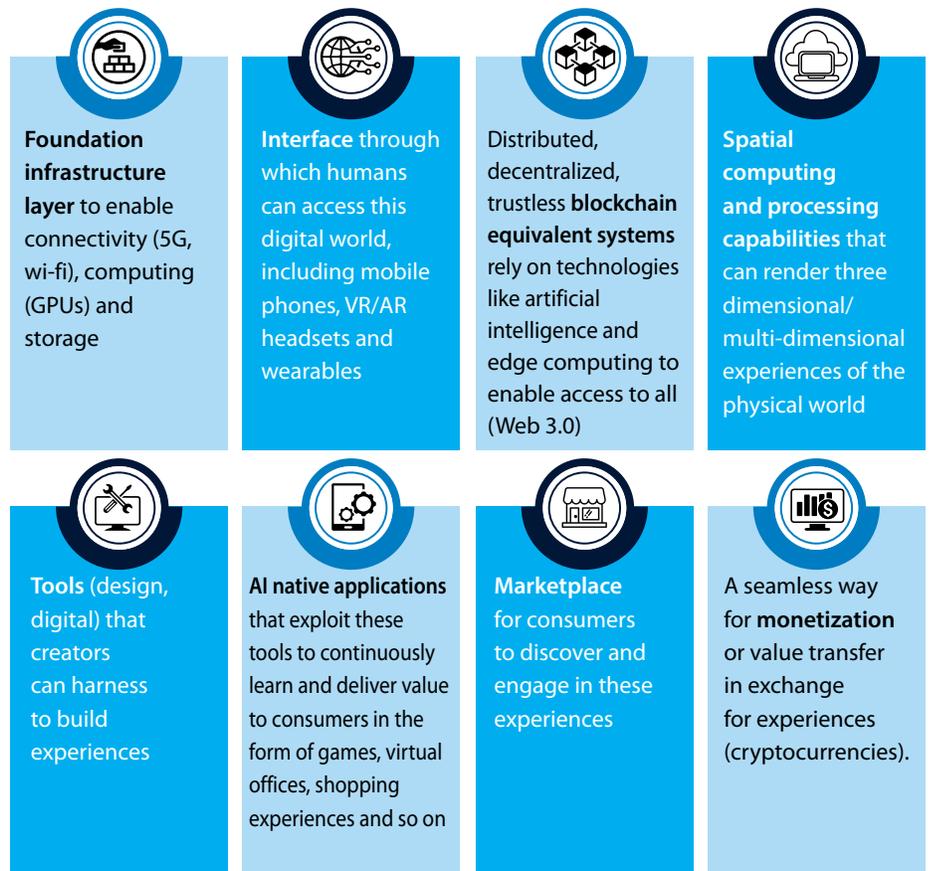
The Web 3.0 concept, in layman's terms, represents a decentralized and democratized internet. It is also called

the immersive web. Finally, this concept relies on technologies like blockchain, decentralized autonomous organizations (DAO), non-fungible tokens (NFTs) and cryptocurrencies. Web 3.0 will be the foundation for the metaverse's frictionless, and democratized existence.

Recent research indicates that the metaverse market can reach almost \$800 billion by 2024. Therefore, it is safe to assume that the metaverse landscape holds immense potential for businesses. According to McKinsey, the impact will be felt across various industries, including retail and consumer companies, gaming, manufacturing, education, and healthcare. As a result, businesses are expected to plow in copious money and efforts to establish a firm foothold in this burgeoning landscape. Businesses, therefore, are left with no choice but to get a good grasp of this technology trend first.

The characteristics of the metaverse

Several layers come together to create interoperability and abstraction for the metaverse and can be classified as:



Businesses are making a beeline for the metaverse

Perhaps Facebook's foray into the metaverse by changing its name to Meta and planning to invest up to 30% of revenues signals the seriousness of this opportunity. And this is not a lone example.

Another initiative is Nikeland - Nike's quick response to the metaverse

opportunity. Teaming up with global platform firm Roblox, Nikeland is a virtual world where users can make their avatars don Nike apparel or sneakers. Furthermore, current or past users can model items from real-life Nike products. In addition, the company has purchased RTFKT, a prominent player in next-generation collectibles, merging culture

and gaming. Nike recognizes that this step will hugely appeal to its younger segment of users and is a sure way to gain their loyalty, eventually boosting sales. The company is committed to growing its digital business, and Nikeland is clearly aligned with its vision of 40% owned digital business by 2025.

Similarly, electronics giant Samsung has taken initial steps in the Decentraland metaverse. There are three areas in its space that focus on Samsung's new products, sustainability initiatives and a personalization space to host mixed reality parties. The company plans to expand its presence further.

Many more enterprises are devising ways to construct a commercial model in the metaverse. We can expect more such announcements soon.



The path to dominating the metaverse

Numerous players (creators, infrastructure providers, individual players) are working on building the metaverse. Some of the names include Epic Games, Meta, Nvidia, Microsoft and Apple, and more will surely follow. However, only those who make the user experience intuitive and frictionless will survive and thrive. In the early 2000s, companies like Google and Amazon became the preferred choice for their users only because they met the expectations and requirements of their target base exceptionally well. That principle of catering to customer preferences still holds good in the virtual metaverse.



The critical role of quality engineering in elevating the customer experience

The metaverse will be very different in operation as the content creation, content consumption, monetization shifts from corporate controlled set up to a highly distributed model.

Delivering a superior customer experience involves several aspects, including a good understanding of various complexities involved and the customer preferences, expectations that translate into tangible user platforms bolstered by sophisticated technologies. In this maze of complexities, where every layer will likely operate in its own siloed world, quality engineering teams with a holistic view will perhaps be the glue bringing in an end-to-end perspective in ensuring customer experiences are not compromised. The quality engineering practices themselves will have to evolve to new paradigms. For example, new tools and solutions must be built.

Here's more to check:



In effect, every layer that constitute the metaverse must be tested thoroughly to ensure a high-performing experience is delivered to the customer. Testing within a layer may be relatively easy when compared to the complexities involved in testing the integration across layers and that will determine who the winners are.

Several solutions will emerge to meet the different types of testing across multiple testing phases. Let's consider one technology dimension that make the metaverse immersive. AI, VR, AR and MR are heavily used owing to their ability to blend physical and digital experiences. The immersiveness cannot be assessed programmatically for quality purposes, but a series of tests can do the job. For that, the testing strategy must encompass the following:

- User experience: The users have 6DOF in the AR/VR/MR world. Scout for the

smallest of "bugs" that can topple an experience.

- Device testing: simulate the experience using AR headsets, browsers to check for the occurrence of physical discomfort.
- Functionality testing: review information flow from the three-dimensional scenes to the backend, check the scene on a browser for anomalies as some scenarios may induce motion sickness or strain on eyes for some people while others may experience it fine.
- Performance testing: check for scene performance, load bearing capability, frame rates etc.
- Cross-platform testing: test across devices to ensure a consistent experience

- Interactivity testing: test for interactivity with multi-person testing
- Real devices testing: test on actual devices to ensure real-world quality
- Other aspects: test for the validity of third-party content, audio quality, governance

To better understand how quality engineering can deliver on the promise of a great customer experience, consider a real-life example of a retail app that connects individual sellers and buyers online. If the app needs to launch a new feature that harnesses the power of AR to elevate the shopping experience by allowing the users to project the image of products in their homes and experience them as if they are physically there, the feature must first be evaluated.

Sample testing scenarios are as follows –

Testing across multiple devices	Scanning usability and intuitiveness	Camera functionality
True-to-size functionality	Optimal image for sellers	Site placement optimization

The complexities and tools required will become clearer as we can imagine this is shifts from a manual to automated mode as the feature evolves. In addition to customer experience, there are concerns about risks and issues in an environment that attempts to blend the physical and digital worlds. In this context, quality engineering can play a big role in testing performance, security, accessibility, hardware, audio/video quality, etc. Furthermore, in the security and privacy domain especially, many aspects such as identity, reputation, theft, harassment, safety and misuse of data come into play. So, quality engineering must be an integral part of an organization's metaverse strategy.



Conclusion

With metaverse taking the digital world by storm, it will likely disrupt how we shop, whom we interact with and work online. Succinctly put, metaverse can usher in a new era of digital experiences. As a result, businesses must pivot their digital strategy to tap into the immense potential metaverse offers to conduct specialized training, showcase products, sell online or simply organize meetings. As they gear up to establish a firm position in this new landscape with a new array of applications, interfaces, tools and infrastructure, organizations must be certain to include quality engineering in their planning. Furthermore, as the metaverse continues to learn and evolve in its quest to be more contextual and sentient to its users, quality management practices must transition from a quality control approach to a quality continuum. This shift is essential for coping with an evolving metaverse and producing memorable customer experiences. After all, we all want experiences similar to or better than what we experience in our traditional physical world. For long-term value, we need a Qualiverse.



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