Web3 and the Metaverse: Incomplete but Complementary Visions of the Future Internet

Published 26 April 2022 - ID G00765430 - 14 min read

By Analyst(s): David Smith, David Cearley, Avivah Litan, Rajesh Kandaswamy

Initiatives: Technology Innovation

Web3 and the metaverse are greatly overhyped, being described as the future of the internet and cyberspace. To exploit their underlying capabilities, enterprise architecture and technology innovation leaders and CTOs must analyze how these concepts could relate to, and build on, each other.

Additional Perspectives

- Summary Translation: Web3 and the Metaverse: Incomplete but Complementary Visions of the Future Internet
  (11 May 2022)

Overview

Impacts

- The emergence of Web3 won't replace the internet, but will extend some of its web components in a decentralized direction.
- As the metaverse evolves, it won't replace the internet or the web, but will build on them to create virtually enhanced and immersive digital (e.g., 3D rendering, AR/VR) and physical (e.g., ambient computing, human augmentation) spaces.
- Web3 and the metaverse are complementary concepts evolving in parallel, and organizations will be able to exploit them independently or together. Although there is only one internet (with some exceptions due to increased geopolitical fragmentation), there will be multiple implementations of metaverses, potentially building on web3.

Recommendations

Enterprise architecture and technology innovation leaders and CTOs should:

- Avoid the trap of focusing on a specific technology when assessing the future of Web3 by concentrating instead on the decentralization of data and applications.
- Focus on extending immersive capabilities to prepare for the evolution of the metaverse. Don't wait for a perfect metaverse that might never arrive.
- Increase the chances of gaining value from Web3 and the metaverse by evaluating when and where centralized and decentralized models (and hybrid models) deliver value. Document a handful of business opportunities in which decentralized models deliver value, establish a portfolio and pursue them.

Introduction

Much hype and confusion surrounds the terms "metaverse" (see Note 1) and "Web3" (see Note 2), which became "hot" topics in 2021. Many are describing them as the future of the internet/cyberspace.

As an enterprise architecture or technology innovation leader or CTO, here's what you need to know:

- Web3 and metaverse are complementary, not competitive. While they have overlaps, they can evolve without each other and gain from each other.
- The future of the internet includes them, but is more expansive and will include advances in other digital technologies.
- Decentralization is a key tenet of Web3, and immersion is a key tenet of metaverse.

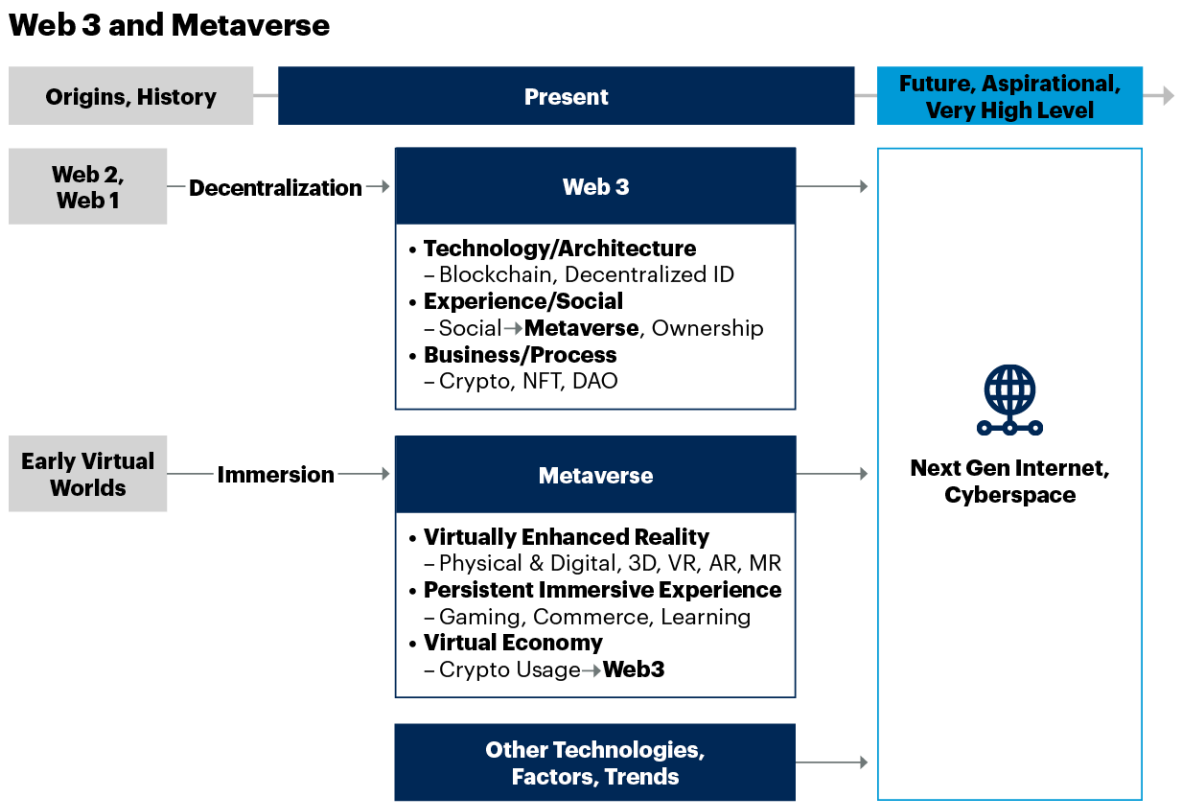
Many have incorrectly characterized Web3, and metaverse as conflicting visions of the "future of the Internet." However, they're separate and complementary concepts. View them as the future of particular parts of the evolving internet.

Web3 is an evolution of the web as it goes beyond technologies and standards for creating, viewing and manipulating and extending webpages that can be viewed via a browser. It also encompasses new experiences and new business models, and decentralization is the driving force behind this evolution. Web3 builds on blockchain protocols to deliver a more decentralized model. It is a gross oversimplification to label web2 as centralized (and bad), while web3 is decentralized (and good).

Metaverse focuses on technologies and standards for creating more immersive experiences, exploiting the internet and web as a foundation and delivering these experiences through websites and other delivery mechanisms (e.g., mobile apps). *Persistent, immersive 3D experiences are the driving force behind the metaverse.* The metaverse emphasizes the notion of fully immersive virtual worlds, digital realms and the physical world, and is evolving from earlier virtual worlds, gaming, social networks, e-gambling, et al.

Figure 1 shows how these two concepts originated and where they aspire to.

Figure 1. Web3 and the Metaverse Are Evolving in Parallel and You Will Be Able to Exploit Them Independently or Together



Impacts and Recommendations

Web3's Emergence Will Extend the Internet's Web Components in a Decentralized Direction

We're in the third wave of the web, which can be called Web3. It began in approximately 2019 (even though there is still debate on its components and architecture) and will probably last for 15 years, like the two previous web eras (Web 1 era was 1989-2004, web 2 era was 2004-2019). Various factions have used different concepts to try to claim and define Web 3, such as the Semantic Web, the mobile web and, now, the blockchain-powered web. A combination of these elements (and others) is likely to characterize Web3, but the leading force today is decentralization built on blockchain protocols.

Examine the emergence and evolution of Web3 by examining the following aspects (see Table 1):

- **Technology and Architecture:** Blockchain is the most prominent technology, but Web3 includes other mechanisms to promote/drive decentralization. It may involve and integrate with many other technologies, such as cloud computing, AR Cloud and the other technologies that are vying to be critical parts of cyberspace.
- **Experience (Personal, Cultural and Social):** Decentralized ownership and management of identity and personal data are key capabilities, and represent a major shift from centralized control.
- **Business and Process:** A distributed economic model has been implemented in many Web3 applications, such as nonfungible tokens (NFTs), decentralized finance (DeFi), cryptocurrency and decentralized autonomous organizations (DAOs). This changes how many processes work, but blockchains have yet to become a critical part of mainstream commercial activities.

Table 1: Web 2.0 and Web3

(Enlarged table in Appendix)

↓	Web 2.0 ↓	Web3 ↓
Technology and Architecture	■ AJAX ■ REST ■ Web as platform via APIs ■ XML, web services ■ Mobile web	■ Blockchain ■ Decentralized web implementations ■ Decentralized identity ■ Authenticated reality ■ Smart contracts ■ Multiexperience ■ Semantic Web
Experience (Personal, Cultural and Social)	■ Wikis, blogs, social media ■ Wisdom of crowds ■ Virtual reality ■ Net neutrality ■ Artificial intelligence	■ Artificial intelligence ■ Digital humans ■ Avatars ■ Metaverse ■ Individual data ownership and management
Business and Process	■ Mashups ■ Advertising ■ Long tail ■ Viral marketing ■ Mass customization ■ Consumerization	■ Cryptocurrency ■ Token driven economies (e.g., via) Decentralized finance (DeFi), nonfungible tokens (NFTs) ■ Democratization ■ Autonomous business, decentralized autonomous organizations (DAOs) ■ Individual data brokerage

Source: Gartner

Complete Decentralization — Idealistic but Unrealistic

Many proponents of Web3 praise its decentralization aspects. Decentralization eliminates central authority and replaces it with peer-to-peer trust mechanisms so that no party needs to trust another. However, the messages in the network can be in fact trusted since they are secured by network validators who are financially incented to correctly validate the messages.

Blockchain networks use game theory in that the financial rewards for being an honest validator far exceed the costs of corrupting the network once it is widely decentralized. The more validators there are, the more secure the network is, and the more the committed blockchain transactions can be trusted. Further, the cost to corrupt the network becomes prohibitive.

Though reduced centralization is a reasonable goal for enterprises, decentralization is not feasible for organizations managed by central authorities who are held accountable for enterprise actions and will therefore not give up control. In fact, most enterprise blockchain efforts have languished or even failed because of this dynamic. A more realistic approach will be centralized services wrapped around decentralized applications.

The web has always had the goal of decentralization and has delivered some degree of it. Even in web2, “radical decentralization” (in Tim O’Reilly’s “What is Web 2.0” manifesto [see Note 3]) was a stated goal that was usurped and centralized. It is a gross oversimplification to label web2 as centralized (and bad), while web3 is decentralized (and good).

There is little evidence that decentralized models yield results for companies. They have, however, yielded substantial benefits for individuals and companies that interact with decentralized applications, as can be noted in cryptocurrency and NFT market activity.

Indeed, centralized entities (the *digerati/digital giants*) are all quite centralized, are incredibly successful and dominate markets; four of them have trillion dollar market caps, and none of them use blockchains in their products/service, as integral to their flagship offerings.

Centralized entities have advantages that will be useful in the fight against the forces of decentralization. These advantages include:

- Brand recognition
- Established infrastructure

- Operational excellence
- Customer service
- Proven, profitable business models
- Operations within global regulatory and legal frameworks
- Learning benefits based on aggregate data
- Centralized governance and individual accountability
- Customer service and protection

Web3 brings a greater degree of decentralization of ownership, authority and control. Nonetheless, complete decentralization isn't feasible for mainstream adoption as customer protections, regulatory compliance, legal frameworks and other centralized services provide the critical support that they need. Only a subset of the global population will want to, and be able to, benefit from the rewards of decentralization while tolerating their inherent risks.

Instead, we will see mainstream adoption of centralized services wrapped around decentralized applications, combining the best of both worlds. This is evident today, for example, with mainstream access to decentralized cryptocurrency networks via centralized exchanges, such as Coinbase and FTX, and via regulated financial institutions such as Fidelity and State Street Bank. It is also evident already in NFT commerce, where Web 2.0 centralized marketplaces like Openseas are providing services for mainstream users creating or trading NFTs.

The decentralization goal is a double-edged sword. Centralization lends itself to a single authority and common standards, while a decentralized approach tends to encourage and enable more fragmentation.

However, as with the cloud, the blockchain and the metaverse, there is more than one physical manifestation, even though there is a universal concept. Potential exists for levels of standardization and common elements, but there will be many manifestations.

Examples of multiple manifestations of universal concepts include cloud and metaverse. In these cases, there are multiple manifestations that are potentially owned by different entities. Standards can ease interoperability concerns in decentralized environments. An appropriate balance between decentralization and centralization is challenging, and — as in many cases — the pendulum effect will apply, and we will trend towards a blend.

In the case of the internet and the web, fragmentation is becoming more of a risk, but for now, the single manifestation view is mostly still vali.(see Maverick* Research: Welcome to the Splinternet — How Internet Fragmentation Disrupts Business and Threatens Society).

Recommendations:

- Avoid the trap of focusing on a specific technology when assessing the future of Web3 by concentrating instead on the decentralization of data and applications.
- Strengthen your business and operating models by focusing on the appropriate Web3 capabilities in your technology architecture, and learn how to add value to decentralized applications by wrapping centralized services, such as customer service around them.
- Consider Web3 (where it is mature and appropriate) to strengthen your business and operating models, rather than simply achieving decentralization for its own sake.

The Metaverse Will Build on the Internet and Web to Create 3D Digital and Physical Immersive Spaces

The metaverse concept has many aspects. These include:

- **Technologies:** For example, augmented reality (AR) and VR, AR Cloud, computer vision, holographic displays, human augmentation.
- **Vendors:** For example, Facebook whose emphasis and name change to “Meta” has invigorated the metaverse concept and is having a huge impact. Other major vendors, including Microsoft, Unity and Epic are pushing the concept. Companies such as Roblox, Linden Labs, Sandbox and Decentraland are focused on building digital worlds.

The metaverse concept is evolving from a fragmented array of vendor-driven efforts, with few recognized open and common standards — none of which are really ubiquitous. In the near term, more vendor fragmentation will occur, as will more isolation of individual examples of the metaverse concept.Over time, however, the fragmentation of the metaverse will lessen as the market settles and more open standards emerge. We also expect some progress toward a set of common technologies (e.g., for visualization, rendering, data formats, etc.), and also to promote interoperability for the metaverse.

Key Driver for Metaverse — Immersion, but to What Degree?

A key aspect of the metaverse is a persistent, immersive shared space (see Note 1) in either 3D physical or digital worlds. An immersive experience is one in which the individual is deeply and wholly engaged. Mental and sensory mechanisms engage the individual with their physical and digital surroundings. The physical world is naturally immersive, and people by default exist in their physical surroundings. Immersive digital reality focuses on the perception of being physically present (through multiple sensory channels), while engaged with this nonphysical 3D "reality."

Insistence on a high degree of immersion tends to pigeonhole the metaverse, putting it in the pure virtual world category. An immersive digital reality with 3D physical sensory input and feedback (e.g., VR, haptic and audio) will be the most hyped aspect of the metaverse. Such "virtual worlds" are computer-generated worlds that humans experience, independent of their physical location. However, the metaverse also will evolve as a digitally enabled physical reality, in which humans exist in the naturally immersive "real world," but with an evermore robust digital overlay as Spatial Computing. Examples include smart homes, smart hospitals and other smart spaces.

Recommendations:

- Prepare for the evolution of the metaverse by exploiting immersive capabilities in digital realms for targeted areas, such as employee engagement, customer experience, field service repairs and customer service in general. Don't wait for a perfect metaverse that might never arrive.
- Maximize the potential benefits of the metaverse by planning to use it as the "physical world digitally enabled," rather than as purely virtual.

Web3 and the Metaverse Are Evolving in Parallel and You Will Be Able to Exploit Them Independently or Together

Web3 and the metaverse complement each other and will evolve independently. However, both are based on technologies whose value is mainly in a community or an ecosystem where value in some form is exchanged between people or organizations or a combination. Web3 and the metaverses could gain these points from each other:

- The Metaverse can benefit from Web3's tokenization as a mechanism to store and exchange value — especially in a purely virtual context. Web3 is often seen as an optional part of the metaverse.
- Web3 consists of experiential and social capabilities, often referred to as immersive and 3D (i.e., the metaverse), but some of these capabilities already exist in digital realms like e-gambling, e-gaming, e-sports and even some social networks.
- Community-based metaverses can emerge more quickly with Web3 decentralization technologies, but decentralization is not a prerequisite for metaverses, nor is Web3.

The metaverse and Web3 won't merge into one entity. Advocates for both believe that they'll become the future of the internet or cyberspace. However, the future of the internet and cyberspace will be much broader than improvements in decentralization and immersion. Both are incomplete views of the future of the Internet. Additionally, note that in Figure 1, the Metaverse can refer to Web3 as an (optional) part, while Web3 — when looked at broadly — can refer to the metaverse as an evolution in its experience or social dimension. This leads to further confusion as a view based on one of the concepts that can essentially subsume the other, as part of each's aspiration to be the future of the Internet.

The web is evolving from a rich set of open, common ubiquitous standards. Arguably, Web3 builds on and subsumes Web 1.0 and Web 2.0, and extends them with additional concepts, standards, identifiers, interfaces and protocols to enable an approach that is more distributed (i.e., technology, rights, control and management).

The metaverse can (and should) build on and exploit the Web3 foundation and then extend into an evolution of 3D, immersive, virtually enhanced digital and physical reality.

The metaverse and Web3 answer different questions and provide different opportunities. You can embrace them individually or together, but together is likely better. People use both to describe the future of the internet, even though many also view them as focused, separate entities.

Recommendations:

- Increase the chances of gaining value from Web3 and the metaverse by evaluating when and where centralized and decentralized models deliver value. Assess the degree to which future internet, web and metaverse models can deliver on these concepts.
- Factor inevitable technical debt from vendor fragmentation and isolation into short-term, intermediate and longer-term plans. Track progress toward technologies and standards that reduce fragmentation and interoperability issues.

Note 1: Gartner's Definition of a Metaverse

Gartner defines a metaverse as a collective virtual shared space, created by the convergence of virtually enhanced physical and digital reality. A metaverse is persistent and provides enhanced immersive 3D experiences. Its own virtual economy will be enabled by digital currencies, nonfungible tokens (NFTs), payment systems or some equivalent.

We expect that a complete metaverse will be device-independent and not owned by a single vendor.

For more information, see Quick Answer: What Is a Metaverse?

Additional notes on use of "Metaverse" versus metaverses and the metaverse terminology include these details:

- "Metaverse" is a concept that refers to the definition above
- A metaverse is an instantiation of the concept by a particular provider
- The term "metaverses" refers to a collection of provider implementations
- "The metaverse" refers to all of the various instantiations and the broader concept

Note 2: Web3 Terminology

Web3 (also known as Web 3 and Web 3.0) enables peer-to-peer interactions with no reliance on centralized platforms and intermediaries. Users own their own data, identity, content and algorithms, and can govern the blockchain protocols they use by owning governance tokens. They participate as "shareholders" by owning the protocols' tokens or cryptocurrencies.

The description of Web3 in this research reflects the definition set out by the Web3 Foundation and its founder, Gavin Wood.

Gartner first wrote about Web3 in 2019 in Hype Cycle for Blockchain Technologies, 2019, where we referred to it as the "decentralized web (or Web3.0)."

For more information, see Quick Answer: What Is Web3?

Note 3: Web 2.0 Original Manifesto

What is Web 2.0, Manifesto.

Recommended by the Authors

Some documents may not be available as part of your current Gartner subscription.

Quick Answer: What Is Web3?

Quick Answer: What Is a Metaverse?

Web 2.0: Structuring the Discussion

Quick Answer: How Will the Metaverse Shape the Digital Employee Experience?

Maverick* Research: Welcome to the Splinternet — How Internet Fragmentation Disrupts Business and Threatens Society

---

Table 1: Web 2.0 and Web3

	Web 2.0	*Web3*
Technology and Architecture	■ AJAX ■ REST ■ Web as platform via APIs ■ XML, web services ■ Mobile web	■ Blockchain ■ Decentralized web implementations ■ Decentralized identity ■ Authenticated reality ■ Smart contracts ■ Multiexperience ■ Semantic Web
Experience (Personal, Cultural and Social)	■ Wikis, blogs, social media ■ Wisdom of crowds ■ Virtual reality ■ Net neutrality ■ Artificial intelligence	■ Artificial intelligence ■ Digital humans ■ Avatars ■ Metaverse ■ Individual data ownership and management

	Web 2.0	*Web3*
Business and Process	■ Mashups ■ Advertising ■ Long tail ■ Viral marketing ■ Mass customization ■ Consumerization	■ Cryptocurrency ■ Token driven economies (e.g., via) Decentralized finance (DeFi), nonfungible tokens (NFTs) ■ Democratization ■ Autonomous business, decentralized autonomous organizations (DAOs) ■ Individual data brokerage

Source: Gartner