

Chapter 1

A Primer on the Metaverse

Whether for a new board game, a phone, or other goodies, nobody looks forward to reading instructions. There's an urge to jump in and go. But the sticklers who crack open the manual "get it" faster. The same thing goes for the metaverse economy. Taking a little time to familiarize yourself with the metaverse, including the terminology and basic concepts, will get you past the learning curve and onto exploring the possibilities of the metaverse economy more quickly.

If you feel like you're already past this "metaverse 101" material, feel free to jump past our terminology section. Head over to the next sections for our take on what the metaverse and metaverse economy are, for crucial context you'll need to understand the rest of the book.

We don't want to turn this into a textbook, so we're keeping this section lean. Keep in mind that the space is rapidly changing and terminology may shift with it. The metaverse is being built today and will take some time to reach its final form (if that even exists). It's also important to recognize that different experts have different definitions and may use a slightly different lexicon. This primer will get your feet underneath you to understand our viewpoints and insights, which are a part of the broader conversations happening in metaverse circles. Also, because the metaverse

is evolving, we encourage you to look beyond our book to refresh your knowledge and keep up.

Terminology

5G: This refers to the fifth generation of cellular wireless technology, the wireless standard thought to be a critical leap forward in cellular communications. The data transference is said to be strong enough for technology companies to deliver more data with less latency or quality degradation. Here, peak speeds can reach up to 20 Gbps and a 1-millisecond latency. In short, 5G is crazy fast, and these speeds will give metaverse travelers smoother connectivity.

Artificial Intelligence (AI): Artificial intelligence is the ability of a computer or robot to “think” or perform comprehension similar to how humans process information, learn, and solve problems.

Augmented Reality (AR): Augmented reality uses technology to enhance the real world by placing data, interactive digital objects, or other digital media “on top” of the physical world. Pokémon Go is a perfect example, where players use a mobile device to find and capture Pokémon creatures in real towns and cities.

Blockchain: The blockchain stores data and includes smart contracts in a way that enables people to have true ownership of digital assets in the metaverse. Smart contracts created for every transaction are stored in decentralized, peer-to-peer networks designed to offer transparent, traceable, and immutable records. Ethereum, EOS, and Solana are examples of public blockchains. This is in contrast to other data systems that are centrally controlled and can be changed by the operators.

Blockchain is the keystone of the metaverse economy because true ownership of assets is decentralized, which makes it publicly available and reliable. Because of blockchain, people can own authentic digital assets such as non-fungible tokens. Because they are authentic, “one-of-one” items, there is scarcity. Where there is scarcity, hence desirability, there is (market) value.

Blockchain Gaming: Just as we described blockchain above, games that use blockchain technology have an immutable, traceable data-storage network behind in-game transactions. This is crucial in ensuring players are purchasing and earning authentic digital items (e.g., fungible and non-fungible tokens). The actual in-app or in-game experience covers anything from traditional video game genres to newer “play-to-earn” and “play-to-own” models.

Cryptocurrency: A cryptocurrency, or crypto coin, is a digital currency that runs on its own blockchain. It functions much like fiat currency, with the key differences being that they are 100% digital and managed in decentralized computer networks (versus fiat’s central banking system). The biggest cryptocurrencies are Bitcoin and Ethereum. However, there are many cryptocurrencies on crypto exchanges. Currently, there is minimal utility for many cryptocurrencies. However, this may change as the metaverse evolves and cryptocurrency becomes a more dominant form of payment.

Crypto Exchanges: These are (mainly centralized) marketplaces to buy, sell, and trade cryptocurrency and some crypto tokens. Examples include Crypto.com, Coinbase, Binance, and Kraken.

Crypto Token: A token is a fungible currency created within a specific application. When these tokens have

utility, they're earned inside applications and used to purchase items or services inside their respective applications. A good example is Axie Infinity's Smooth Love Potion (SLP) tokens, which are earned by winning in-game events and then used by players to breed new Axie creatures.

Crypto Wallet: These wallets are secured software platforms that store a person's crypto assets.

dApp: A decentralized application, or dApp, looks and performs just like any other app from video games to productivity software. The key is the decentralized network behind the user experience that uses blockchain to store data and smart contracts. We break dApps into two major categories: platforms and single-functionality apps. A platform allows other dApps to function inside its ecosystem (think Salesforce's AppExchange), while dApps with singular functionality don't.

Decentralized autonomous organization (DAO): A DAO is represented by transparent rules via computer code on the blockchain that have been defined and are controlled by the organization members. DAOs use blockchain-based smart contracts to record governance rules and voting results. It's "by the people, for the people" governance inside an application.

DeFi: Coinbase defines DeFi, or decentralized finance, as an umbrella term for financial services on public blockchains. You can do most things a centralized bank system supports, such as borrowing, lending, trading, and so on. However, DeFi is a peer-to-peer system that doesn't require an intermediary third party such as a bank.

Edge Computing: IBM defines this as a distributed computing framework that brings applications closer

to data sources. Internet of Things (IoT) is a good example: A smart refrigerator is capable of connecting back to a data source (from the manufacturer) while processing user input.

Fungible Token: Fungible tokens are interchangeable assets with 1:1 value. A good example is Bitcoin; one person's Bitcoin is equal to another's Bitcoin. In-game utility tokens are also good examples.

Minting: Minting “certifies” a digital asset on the blockchain to turn it into a non-fungible token.

Non-Fungible Token (NFT): An NFT is a digital asset that is unique and singular, backed by blockchain technology to ensure authenticity and ownership. An NFT can be bought, sold, traded, or collected. Virtually anything can be an NFT: art, sports highlight clips, game items, even information.

Play-to-Earn Games: This is a relatively new game genre where people play to eventually extract monetary value.

Smart Contracts: Ethereum defines a smart contract as simply a program that runs on the (Ethereum) blockchain. It's a collection of code and data capable of sending transactions over the network. These contracts are not controlled by users. Instead they are deployed to the network and run as they are programmed. Smart contracts have defined rules, like any other contract, and automatically execute them via their coding.

Virtual Reality (VR): With VR, a computer-generated 3D space is generated around the user via wearable technology such as VR goggles. These are typically interactive environments where users not only see a 360-degree 3D environment, but they can “touch” and

interact with the environment through handheld devices. A popular application is 3D video games.

Wearables: If technology attaches to the user in some fashion – headwear, wristwear, toe wear, or even implants and tattoos – it’s a wearable.

What Is the Metaverse?

Now it’s time to address one of the most essential questions we can ask: What is the metaverse?

It’s a simple question. However, explaining the metaverse has the same elusive quality as describing the Internet to our grandparents. A quick Google search for “What is the metaverse?” will take you on a journey that twists and turns, but doesn’t get very far. It’s confusing. We’re not judging or knocking anybody’s take on the metaverse. The lack of a de facto definition is a product of the times. All of the experts are trying to define something that hasn’t been fully realized yet – the paint is still wet so we can’t see its true colors.

This is where having three co-authors gets tricky. We each have a different perspective:

Cathy, the Futurist: “The metaverse is a convergence of our physical and digital selves. Through Web 3.0 technologies such as VR, AR, AI, cloud, blockchain, crypto, 5G networks, and edge computing, the metaverse allows our respective digital identities to catch up so we’re consuming content and creating revenue streams in a wholly interactive manner. There’s only one metaverse and it’s not here yet in its greater form. It’s being built and this decade is critical. It includes both the virtual and the physical world.”

Dirk, the Serial Entrepreneur: “The metaverse is like a parallel, immersive world that blurs with the real one where people assume one or multiple identities.

At its core, it puts individuals at its center. They are in control of their assets and data, which they can use, trade, sell, and everything else that ‘true ownership’ powered by blockchain enables them to do. That’s why blockchain is a fundamental pillar of the metaverse.

“Are we there yet? Not fully. We can beam ourselves into metaverse platforms to enjoy true ownership and share experiences with other people and brands in like-minded communities. To reach the full vision, we need to be able to easily port our identities, data, and assets when moving from one platform to another. This can take another five or ten years from today, but the journey has already begun.”

Tommaso, the UC Berkeley Faculty in Entrepreneurship: “The metaverse is the next generation of consumer engagement: an immersive experience with a self-sustaining, community-driven economy at its center. It’s a new digital reality for consumers empowering joint value creation: to build empathy with brands by becoming part of the product, rather than being the target of advertising.”

As different as they are, all of our perspectives are correct. We could go on pontificating, but we don’t want to spiral into technical lectures. Instead, we consolidated our perspectives to make the metaverse easier to understand. At the very least, it gives us a central definition, a North Star, to drive the rest of the book.

The metaverse represents the top-level hierarchy of persistent virtual spaces that may also interpolate in real life, so that social, commercial, and personal experiences emerge through Web 3.0 technologies.

There is a lot packed into that sentence, so let's break it down, phrase by phrase.

The metaverse represents the top-level hierarchy:

In terms of all the blockchain systems out there, the metaverse sits on top of them all. To put this in context of more familiar technology, it's on the same hierarchy level as social media.

The first sighting of the metaverse wasn't online or in a mobile app. It wasn't conceptualized by a technology company or someone like Sir Tim Berners-Lee, the inventor of the World Wide Web. It comes from a novel published in 1992. Neal Stephenson's *Snow Crash* is a piece of science fiction that depicted the metaverse as a space where the physical met with the virtual in a digitized space. It's said that "metaverse" is derived from two root words: "meta" and "universe." The *Merriam-Webster* definition of "meta-" as a prefix is "more comprehensive; transcending," or "situated behind or beyond."

We like that concept, beyond. In the early days of blockchain (yes, 2022 is still early days), it may be hard to see things like Bitcoin under the metaverse umbrella. Why? Because Bitcoin has been around far longer and is much bigger than the metaverse today. However, the scope is rapidly expanding. The open nature of the metaverse will encourage all sorts of integrations, including Bitcoin and various other cryptocurrencies. We'll get into this a bit later when we cover interoperability and the metaverse economy.

What Isn't the Metaverse?

The open metaverse is a very inclusive place. With that comes some gray areas in regard to what is and isn't the metaverse. Some blockchain games or even social media networks refer to themselves as a metaverse, for example. In our opinion, this is incorrect. A company referring to itself as the Metaverse (with a capital M) is like Google calling itself the Internet. In many cases, these companies can't even connect to the metaverse. With that said, we'll give a pass to decentralized apps referring to themselves as a metaverse. At least these applications are decentralized. However, we think of these dApps as a "lowercase m" reference to the metaverse as a part of the overarching, "capital M" metaverse. Upland, for example, describes itself as the "metaverse platform that is mapped to the real world."

Games such as Roblox, Minecraft, and Fortnite are often labeled as metaverses (with a lowercase m) too. These games should take credit for proving that there are strong consumer appetites for online communities and economies. However, we'd sooner label them as centralized virtual worlds or online game platforms than metaverses.

Any of these platforms could make for solid partners for digital products. There are many examples of big brands doing just that. Nike, for example, partnered with Roblox. But generally speaking, centralized worlds operate differently than decentralized apps. One key example is governance. dApps hold on to the values of user governance, while centralized games are governed by the game

(continued)

publisher or development studio. As such, people have less say over game mechanics and the economy.

In many traditional video games with microtransactions or other in-game purchases, you see top-down, centralized economy management where the game publisher or game studio controls the exchange rate for in-game currency, item pricing, and merchandise availability with complete authority. They may listen to the player base, but can prioritize profits over the player if desired. As a result, sometimes there's community backlash. Electronic Arts (EA) in particular has faced public scrutiny and took a hit to its brand due to what some in the gaming community consider exploitative monetization of game mechanics via microtransactions and loot boxes that incentivize extra in-game consumer spending. Japan, China, the Netherlands, and Belgium have all passed laws protecting gamers from microtransaction exploitation and the US and UK have legislative action in the works (with no laws being passed at the time of publication).

We aren't saying Roblox, Fortnite, or Minecraft are guilty of exploitation. What we are saying is that they are centrally governed and can mold the economic models without checks and balances. In the decentralized, bottom-up metaverse, however, we see the reverse – consumers are more invested because they have a vote inside the ecosystems they enjoy. When we say vote, we mean that literally. For example, the core mechanic of fan token games such as Socios.com is voting. Here, players purchase tokens that represent votes that lead to decisions real sport clubs agree to act on. Another example is

Decentraland's DAO (decentralized autonomous organization). The DAO is a collection of players inside the game that control policies.

When users have a direct say in outcomes, there's a sense of communal ownership. This is a great way to create a sticky user base that is willing to open their crypto wallets because they help shape the ecosystem. Sure, not every player will agree with voting outcomes, but having a say still gives them a sense of empowerment – just like voting rights in a democracy.

Another key distinction in the metaverse economy is asset ownership. Players aren't just breeding pets to win a game or buying cosmetics for game characters; they own the digital property and can sell these items in peer-to-peer markets. This gives players extra incentive to play, because there's something tangible to be earned if they desire. At the very minimum, they can play for prestige by earning highly sought items in their virtual communities.

In short, the metaverse should be synonymous with decentralization where people are in the driver's seat just as much as technology companies.

Persistent virtual spaces that may also interpolate in real life: The metaverse isn't a single, centralized destination like Google, Amazon, or TikTok. The metaverse weaves together experiences from disparate applications and the real world to offer something, as *Merriam-Webster* puts it, transcending. In addition to a purely virtual experience, users will also be able to leverage their assets or virtual identity in the real world. And like the Internet, the metaverse is always on,

preserving user information for whenever they come back.

Social, commercial, and personal experiences: As we mentioned, the metaverse is a confluence of activity and everyone will have a different goal – including brands. Some will have friends and communities. Others will focus on running a business or adding new digital channels to existing business models. Like the Internet as we know it, the metaverse offers access to these things, albeit in new, immersive ways that deepen user connections to their preferred environments.

Web 3.0 technology: Web 1.0 was the Internet of the 1990s and early 2000s. Web 2.0 added social networks, eCommerce, user content creation, and the sharing economy. Web 3.0 is about more immersive experiences. This includes smarter search engines, social networks, and other systems that will know more about each user's preferences and deliver content with user-based context. More personal delivery is about “smarter” content curation, but also more immersive connectivity to these systems. That means VR and AR systems that mimic physical interaction and break the wall between user and technology. We also need to consider underlying technology delivering these new experiences, such as blockchain, cloud computing, and 5G cellular networks.

As you can see, the metaverse is a blend of the blockchain, web, social media, online gaming, DeFi, and advanced hardware. It's partly an actualization of what a more advanced Internet or social media channel could be. But the language to explain it today is still primitive. If you mentioned “TikTok” to someone in the 1990s, they would think you were talking about a clock. (Just look for Katie Couric and Bryant Gumble's 1994 video on explaining the Internet and you'll get what we mean.)

Putting the Metaverse in Historical Context

It's always been important for humanity to expand the social and cultural circles we create. Technology has always been the key to spreading our ideas and connecting with one another. The metaverse is no different. Similar to cultural inflection points such as the World Wide Web and social networks, the metaverse gives people and brands new, empowering ways to connect, earn, and interconnect their digital and physical identities. In fact, we have a name for them:

- ◆ **Web 1.0** represents the period when the Internet connected the world's information systems, which changed how consumers make purchasing decisions and engage with brands.
- ◆ **Web 2.0** represents the rise of social media, eCommerce, the sharing economy, and user content creation. This is where we see the rising importance of followers, likes, shares, and subscribers.

We're now entering **Web 3.0**, the next inflection point when technology will interconnect people, places, and things in the real and digital worlds. The idea of the metaverse has been around for decades, but technology needed to catch up. Now that generations of digital natives have grown up with powerful computers in their hands from infancy, we're seeing technology and culture come together. These generations have greater expectations for technology than those who grew up in the Web 1.0 or even Web 2.0 eras.

What does this mean? There are many implications. People value their digital identities more. They want and expect immersive experiences, not just with their downtime but with other aspects of their lives as well. Also, we are seeing the rising importance of consumers getting directly involved with digital commerce – not only from the buying

side, but the selling side as well. Consider the reward systems of each inflection point. Web 1.0 and Web 2.0 offered intrinsic rewards such as learning something new, connecting with other people, or getting a quick dopamine fix from cat videos. Getting into the metaverse, and more importantly the metaverse economy, we see a shift to intrinsic *and* extrinsic rewards. So in combination with the feel-good moments of consumption, people are experiencing financial gain in these digital worlds. It's no longer enough to search and consume information on the web. It's not even enough to socialize. People are shifting toward deeper immersion much closer to what we see when we're offline than when we're jacked in.

This paradigm shift comes down to three core principles:

- 1. Experience:** People don't just want to consume. It's far more engaging to have gamified, contextual experiences.
- 2. Identity:** People value their digital personas and want to carry it with them across the metaverse and even into the real world.
- 3. Ownership:** Wherever people choose to spend their time, they want skin in the game.

Accordingly, the next decade will transform business models, product portfolios, and career paths. And the home of this new paradigm is the metaverse. Just like the Internet and social media, people and companies that jump in early will define the experience and find groundbreaking opportunities.

The metaverse is the culmination of Web 1.0, Web 2.0, and growing digital-first consumerism. It's still in its infancy, but if brands learn anything from the past, it should be that the early adopters gain an advantage that lasts. Some companies can pivot late, but the whiplash

causes a serious nosebleed. In 2006, Google caught on to social sharing with its YouTube acquisition for \$1.65 billion. Microsoft saw the power of community-based games and the potential of tapping into younger, digital-native consumers by paying \$2.5 billion in 2014 for the Minecraft intellectual property. Facebook caught up to social media's shift to video by acquiring Instagram in 2012 for \$1 billion.

It seems like Facebook learned its lesson about where it wants to be on the technology adoption curve too. So much so that in October 2021 the company rebranded to become Meta, a metaverse-first company. That's a company with 2.9 billion monthly active users (not including Instagram) turning the wheel before the metaverse goes mainstream. If that's not an indicator for where the metaverse is headed, we don't know what is.

Those who lead in the metaverse are well-positioned to connect with the audiences in a new frontier and leapfrog the competition. Not bad for a few NFTs, and it's all thanks to the metaverse economy.

A Universe in the Palm of Your Hand

Have you ever tried to picture what all of the connected parts of the Internet look like? Kinda messy, huh? The metaverse has its share of tangles as well. But we're going to cut through the nitty-gritty details to get to the core. And thankfully, once you get the metaverse down to its roots, it's pretty straightforward.

A good way to think of the metaverse is to picture our solar system. At the center is the sun, which in this case would be a blockchain such as Ethereum, Polygon, or EOS. Orbiting around the blockchain core are dApps. These applications are where people "go" in the metaverse.

Looking at Figure 1.1, you'll see that today's metaverse is full of "walled gardens" where dApps aren't connected – even if they're on the same blockchain. This is similar to traditional software and application platforms that don't "talk" to each other. Siloed applications make it difficult (or impossible) for users to move their data and assets with them. As people spend more time in their favorite dApps and earn more assets, the pressure for people to take their coins, tokens, avatars, NFTs, and other assets across apps will increase. The long-term vision is an open, decentralized metaverse, but there are technological and aesthetic challenges.

For example, if a player earned a unique NFT of an astronaut in a space exploration game, they should be able to use it in other dApps. But how should that NFT look and function in a different dApp, such as a medieval fantasy game? Every dApp has a unique visual design and game rules. Moving assets across dApps brings immersion and game-breaking challenges dApp operators need to solve.

Interoperability Is Key to the Metaverse's Future

We've looked at the metaverse's siloed current state. Interoperability – the ability for systems to connect and exchange information – has been around long before the metaverse. But perhaps many dApps call themselves a metaverse (with a lowercase m) because the bridges of interoperability are a ways away; it's hard to think of individual dApps as part of a whole when there's no interoperability.

Blockchain-based dApps have the potential to communicate and exchange information in ways we haven't experienced before in the history of the Internet. We can have an "open metaverse." So while every app and blockchain are built and operated by different companies,

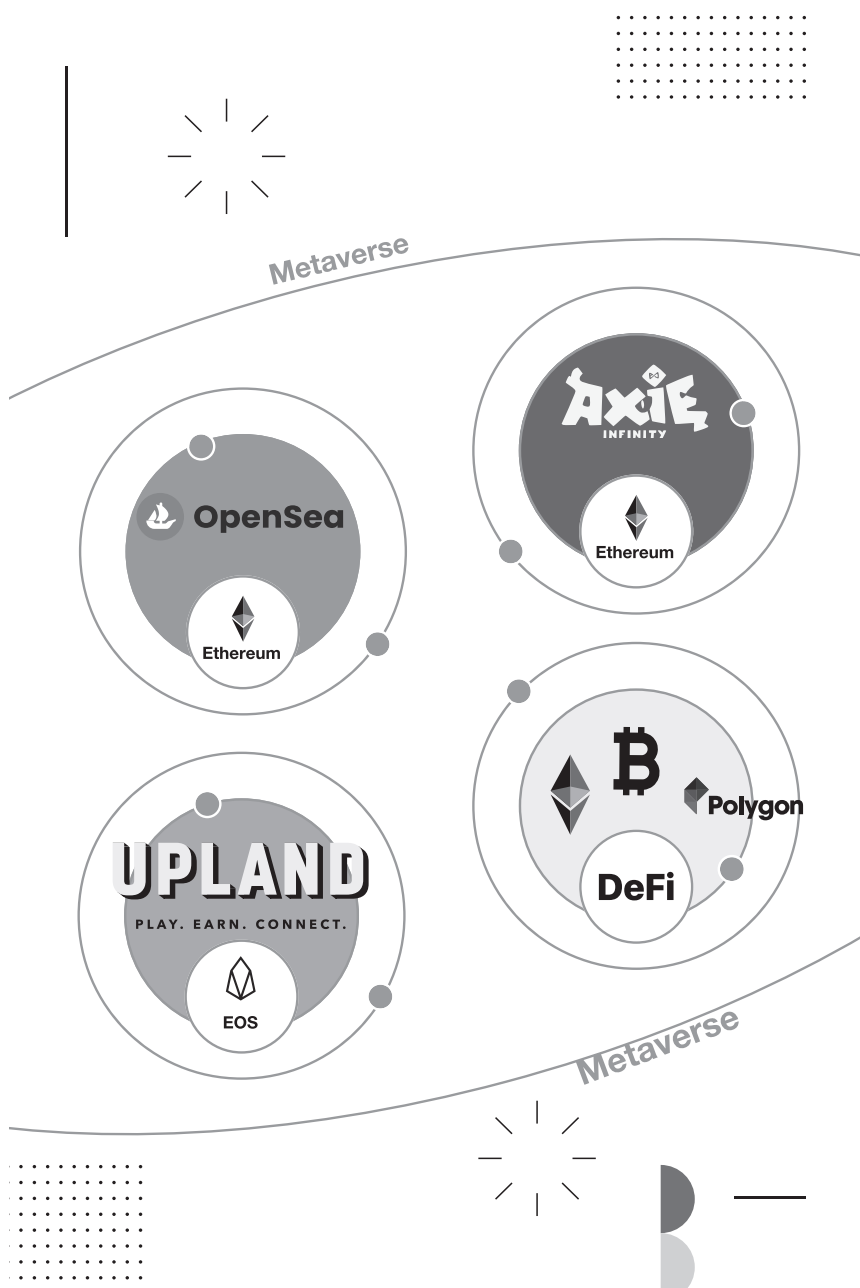


FIGURE 1.1 The young "siloed" metaverse.

the full vision is a connected universe of applications. People will move between dApps and bring their assets and identity with them. It's a total game-changer that will redefine the online experience *and* blur the lines between the real and virtual worlds.

Figure 1.2 illustrates how all the blockchain “solar systems” can connect. This interoperability means that data, currency, and assets within one blockchain could be carried by users to another blockchain ecosystem. In essence, every dApp – regardless of the blockchain it's on – has the ability to interface with every other dApp.

Interoperability has implications on two levels: in the user experience and in the underlying infrastructure. We won't go into the technicalities of the metaverse's infrastructure here; that is a topic better suited for software developers, engineers, and dApp operators. What is important to discuss here is how interoperability impacts user behavior. Let's use a hypothetical example. In Axie Infinity, players breed Axie creatures and compete with each other in battles using their Axies. In Upland, players collect properties and explore a digitization of various cities. These dApps exist on different blockchains – Ethereum, Ronin, and EOS, respectively. Through interoperability, it's possible to take an Axie creature out of Axie Infinity and put it into Upland. Maybe the player can use the Axie as a pet inside an Upland property. Maybe the player has a rare Axie and wants to show it off outside Axie Infinity. As we mentioned earlier, dApp operators need to figure out how to make interoperability seamless across the metaverse to allow people to fully enjoy their digital assets and chosen environments.

Some see this shift from silos to integrated as the key to our digital identities catching up with our real lives. When you go out on a Friday you don't have different names and driver's licenses for every bar. You don't change

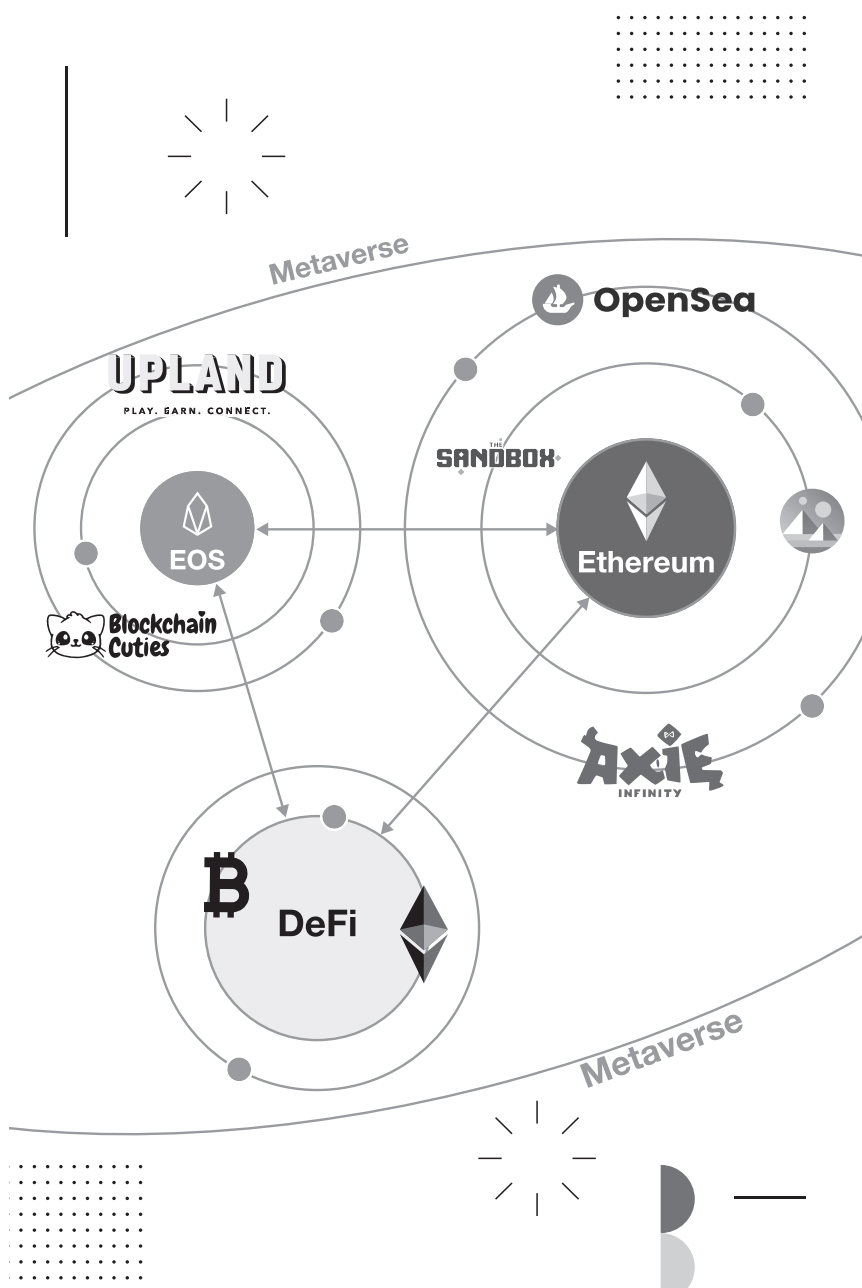


FIGURE 1.2 The metaverse's interoperability potential.

your wallet or clothes either – you just go. As the metaverse matures, users will take their items and identities along as they hopscotch across the virtual destinations. The stitches of the metaverse will weave closer and closer together until it's all one big experience.

When businesses develop a metaverse strategy, they need to think of the metaverse as part of a whole, similar to an omnichannel strategy. Figure 1.3 shows how NFTs owned in the metaverse may be utilized to drive commercial opportunities in real life. Let's say a business launched NFTs into a dApp as part of a player-to-player competition. The NFTs become a sort of trophy. Now that this player owns a unique asset, there are opportunities to further gamify the consumer experience. For example, the business could design the NFT as a key to exclusive discounts in stores, for early access to products, as a ticket to private events, as a membership card to a club, or some other real-world experience. By doing this, companies can tie together the metaverse economy with their overall business strategy.

As cool as interoperability is for users, the metaverse has an even grander vision. Integration doesn't stop at dApp interoperability – the metaverse is meant to be a part of our digital *and* physical realities. This brings a major opportunity to brands looking for ways to get digital-first consumers to reach out and touch their products.

We aren't seeing this vision fully expressed yet. Today's metaverse looks more like the western frontier days in the United States. People headed west in the early 1600s and gradually dotted the frontier with small towns. There was little connecting these settlements to the settled eastern states until disparate railroads, the Union Pacific and Central Pacific, finally connected their tracks in 1869 to form the transcontinental railroad. Until the transcontinental brought the country together, towns and provinces functioned in smaller circles.

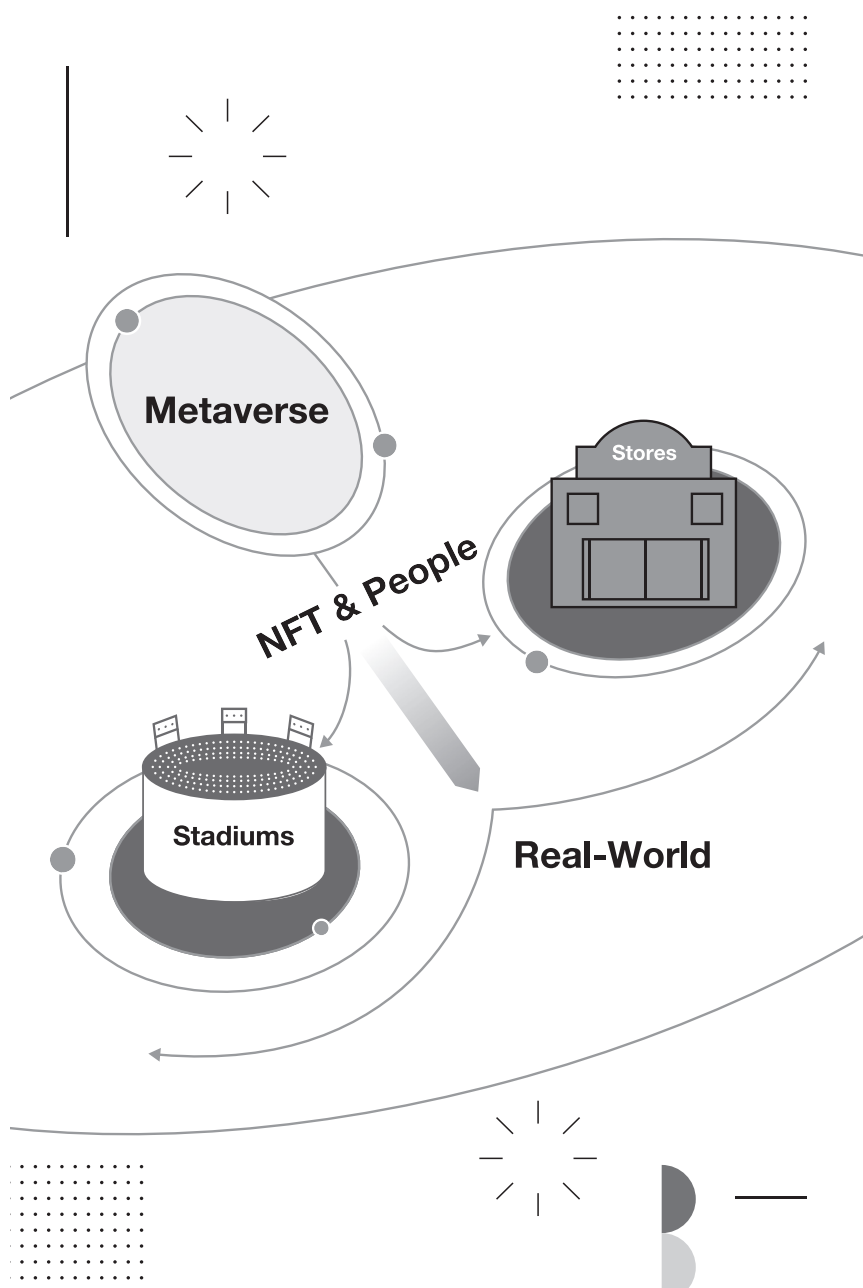


FIGURE 1.3 Extending the metaverse to real-world experiences.

Now you should have a good grasp of the metaverse, underlying technology, and why it's important. It's a lot to digest, so here's an acronym to help:

C: The metaverse is designed to give like-minded **communities** of common interests digital sandboxes to play, earn, own, and socialize.

U: The decentralized economy is **user** controlled, not centrally governed.

T: The metaverse experience is possible through Web 3.0 **technology**, such as blockchain, 5G networks, VR, AR, and cloud computing.

E: Experiences and interactions give NFTs greater utility, which drives greater value.

R: A connection to the **real world** gives the metaverse value beyond entertainment as it augments real-world experiences and offers the potential for real financial gains as well.