

A pragmatist's guide to the metaverse

What is the metaverse? Ask three people, and you'll get three different answers. But even as it evolves, one thing is sure: it's not too early to apply metaverse components and concepts to key business challenges.

Here's the real deal on using the metaverse today, with an eye on scaling in the future.



Table of contents

A virtual world you can't ignore	03	How to use the metaverse today	20
		Four business opportunities with big returns	
What the metaverse is—and isn't	05	A new place for consumer engagement	22
Concept vs. reality		A virtual approach to business operations	24
The makings of a metaverse	07	How to get started	27
Here's what makes a metaverse work			
The hard stuff: technologies, tools and systems	09		
On the softer side: supporting concepts	12		
Averting risk, reaping rewards	15		
Four metaverse hazards to avoid			



**A virtual world
you can't ignore**



A virtual world you can't ignore

The metaverse is still emerging. But it also offers value today.

The metaverse. Isn't that a place for gamers, NFT collectors and kids playing Roblox? So why do we keep hearing about serious companies—[banks](#), [retailers](#), [healthcare organizations](#)—setting up a presence there?

Are companies making the jump just because they don't want to miss out? Would it be safer to wait and watch?

The answer is that the metaverse is still emerging and is actually years, even decades, from full maturity. Even the naming conventions for this virtual world aren't settled in yet—is it “the” metaverse, “a” metaverse, “some metaverses”?

But don't let that deter you. Even at this early stage, the value that can be obtained from the metaverse is close at hand. The buzz and hype may be exaggerated, but that doesn't mean you can't obtain value from the components and parts that go into the design and functionality of the metaverse today.

With the potential it has to offer—customer engagement, employee experience, new revenue channels, more efficient business operations—it's time to understand its components and how these can be applied to business opportunities today.

At this stage of the game, it's this pragmatic approach that will enable businesses to gain a critical foothold in the virtual world: building on what exists today to generate value immediately, while retaining the agility to scale for tomorrow.



What the metaverse is— and isn't

Concept vs. reality



First, the concept

The metaverse is often envisioned as a single virtual "place" that supports a wide range of activities, from socializing and gaming, to working and trading digital assets. People, represented by avatars, move easily and seamlessly from activity to activity, and from place to place. No matter where they go or what they do, their avatars (and their digital credentials) stay the same due to wide-ranging interoperability.

In this digital world, virtual and augmented reality (VR/AR) enable avatars to move and interact as naturally as their physical-world counterparts. People are no longer bound by geography, and the relationship between the physical and digital is completely redefined.

But let's get real

In reality, the metaverse does not exist. Instead, there are multiple metaverse programs and platforms, each with its own applications, key selling points and target demographics. There's no single set of credentials that unlocks access to all of these separate platforms, and no way to seamlessly move from one platform to the other.

Not only does the hardware used to access these separate virtual worlds vary between VR and AR devices, PCs and mobiles, but the very infrastructure that underpins them and the ethos behind their existence also differs drastically.

Some, like Meta's Horizon Worlds, stick to the traditional centralized infrastructure that permeates the web today. Others, such as The Sandbox or Decentraland, are based on web3, or decentralized, principles and distributed ledger technology, such as blockchain-supported payments, identity and digital ownership.

The metaverse, therefore, is a catch-all term that encompasses all these platforms and the infrastructure that supports them, as well as how they converge to create value and new experiences. Standardization efforts have begun, but are a long way off.

Even if the concept never quite comes to fruition, though, the "messy in-between" is not a time to stand still. If the past is prologue in the world of evolving and emerging technologies, the lights can come on quite suddenly, and you'll want to have your place in the metaverse ready.

The makings of the metaverse

Here's what makes the metaverse work



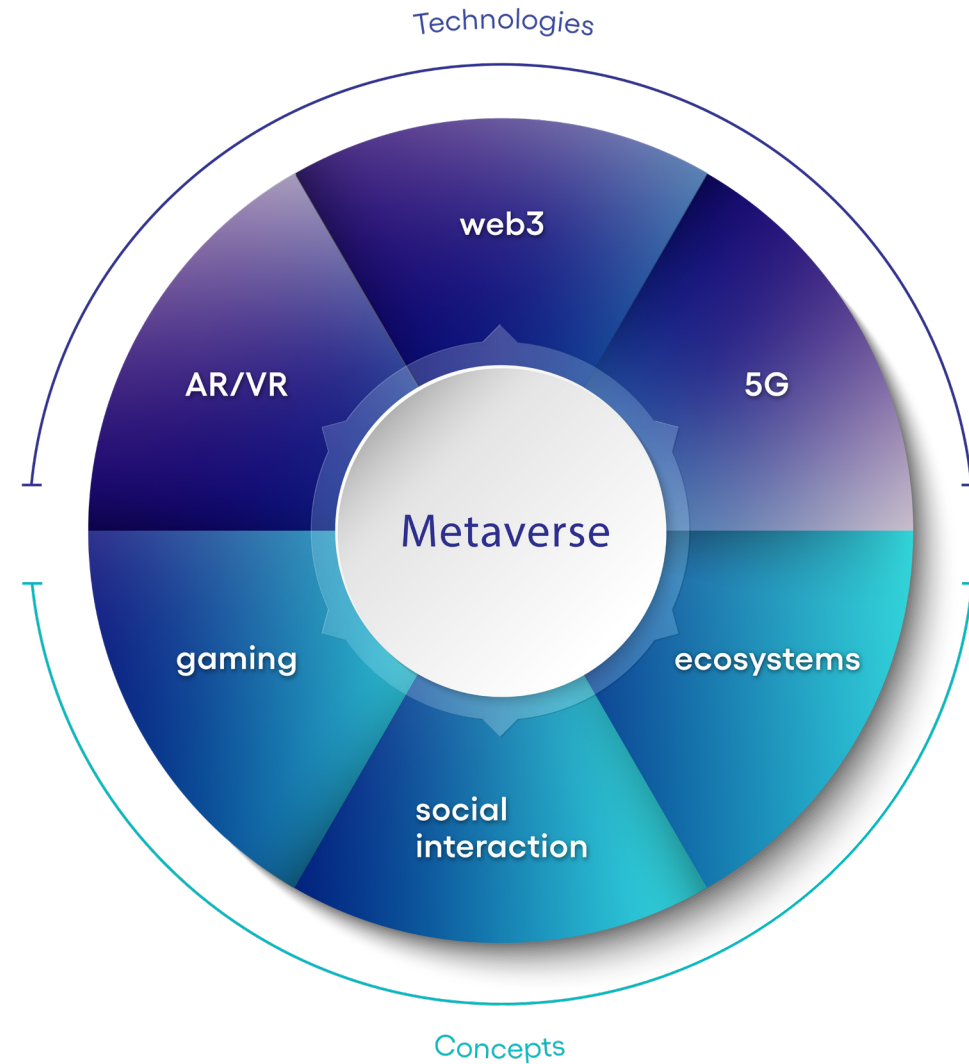
The makings of the metaverse

Here's what makes the metaverse work

While the metaverse as a whole is still evolving, its component parts are ready for use now.

These components include both the technologies, tools and systems that these virtual worlds are built on and accessed through, and the underlying concepts that support the new experiences. Some of these technologies have been around for some time, and the concepts are already being successfully applied in active metaverse platforms today.

But it is the convergence of these technologies and concepts that is truly the game changer when it comes to leveraging the metaverse.



The hard stuff: technologies, tools and systems

AR/VR—there's room for two

While there's much debate as to whether AR or VR will dominate the market, the truth is that each offers its own unique value. Each enables users to experience and interact with the digital worlds that make up the metaverse and the avatars that inhabit them.

It's possible to use a PC or mobile device for these experiences and interactions, but the immersion and physical interaction delivered by a head-mounted display (HMD) and either hand tracking or physical controllers are much more natural and engaging than that of a keyboard, mouse or games controller.

While current headsets can be hot and heavy, the technology is advancing rapidly, and a new generation of slimmer and lighter devices suggest the beginning of a more comfortable way to access the metaverse.

VR and AR offer different experiences, with VR fully immersing users and AR layering digital items over the real world. Use cases that demand a fully immersive experience will benefit more from VR use, whereas others that depend on interacting with the real world will necessitate AR. Neither is better than the other, and neither is “wrong.”

So, while Meta is hard at work building a platform that focuses on VR interactions, Niantic, the maker of *Pokemon Go*, is looking to create the “real-world metaverse,” using persistent digital objects and information to supplement the real world. With the latter, users retain the ability to engage with others in the same physical space, as well as with digital avatars from remote locations.

The hardware is also converging; Meta's Quest Pro, Apple's HMD, and the Lynx R-1 are mixed-reality devices enabling both AR and VR use. So, it's not so much a case of which is better than what meets the requirements at the time.



Web3—integral to but not synonymous with the metaverse

It's easy to conflate the metaverse and web3, or think that without a web3 infrastructure, a platform isn't metaverse worthy. Neither is true. While web3 technology and the metaverse do complement each other, that's not to say one can't exist without the other.

Here's why web3 and the metaverse are often said in the same sentence: it all comes down to decentralization and the democratization of control.

The core principle of web3 is wresting control—over data, finance, ownership, rules of operation and identity—from a central authority. Compare that with today's internet, where Big Tech and financial services providers make the rules and run the show.

Distributing information across many servers or nodes using blockchain or other distributed ledger technologies, such as [Hedera Hashgraph](#), allows for secure data storage and hands control over to the data owners themselves as to what it's used for or to whom it is sold.

Distributed ledger technologies also enable the use of cryptocurrency to bypass banking and financial systems, nonfungible tokens (NFT) to provide records of digital ownership, and smart contracts to automate processes based on activity stored on the blockchain.

Metaverse platforms can be either web 2.0 or web3 based, and the decision on which is best rests entirely on the use case that they are being used for. Those that use web3 concepts see these capabilities as differentiators, as they give them the ability to support certain functionality, such as the creation and sale of digital land or the use of a crypto wallet for digital identification and payments.



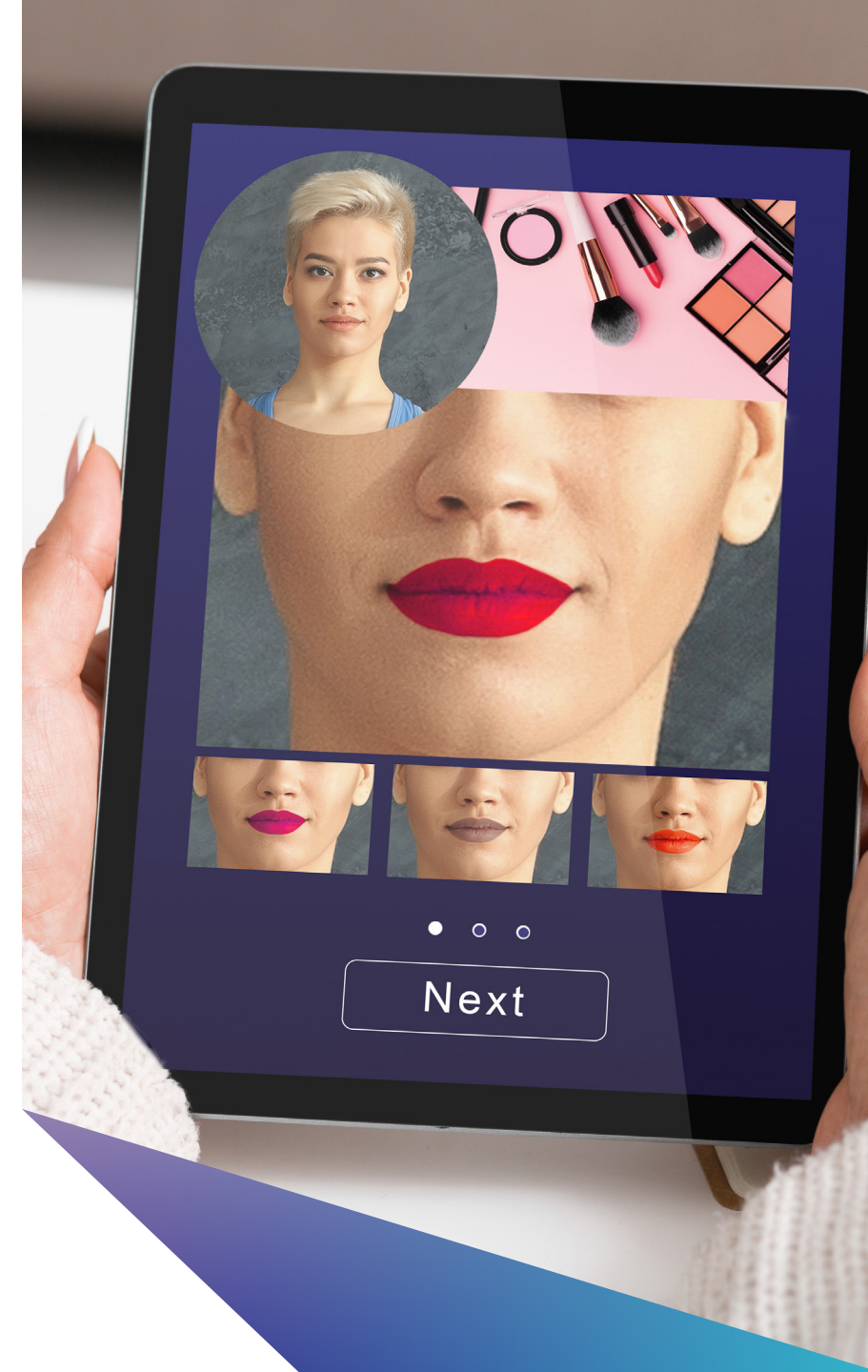
5G—the fiber of the metaverse

5G and its descendents will play an essential role in delivering a streamlined metaverse experience because it solves the longstanding problem of bulky and uncomfortable VR/AR hardware.

Currently, VR/AR headsets require powerful processors to be embedded in them because content is processed on the device itself or with the help of a connected computer. This makes the hardware cumbersome, hot and difficult to move around with. With the higher bandwidth of 5G, however, content can be processed elsewhere and then streamed to the device.

Services such as Google's Stadia or Microsoft's Xcloud already deliver high graphical fidelity content to low-power machines, but the experience can be patchy and requires a high-speed connection and proximity to data centers.

Widespread 5G promises to remove these quirks and allow a seamless experience both at home and while on the move, and will also allow other sensors to feed into the experience. As devices in our homes, workplaces and cities become increasingly connected, they will feed information to metaverse platforms seamlessly using 5G. Doing so will enable metaverse platforms to utilize digital twins (virtual representations of physical objects) that replicate their real-life counterparts.



On the softer side: underlying concepts

Social interaction—we're still only human

The metaverse is made for social interaction. This can range from playing poker with a friend, to creating an entire community, to collaborating with colleagues, to receiving remote assistance, all virtually. The key is that the benefits of in-person communication can now be transferred to a digital experience, and enhanced beyond what can be achieved in the real world.

In a world now accustomed to hybrid and remote work, and with friends and families often living on different continents, the use of technology to bring people together who are physically apart has become of paramount importance to many.

Activities once firmly founded on in-person social connectivity, such as going to the cinema or a live music event, now have digital counterparts. TV subscription services have “watch together” modes that sync remote viewers’ streams, while live concerts have been redefined and held at a scale never before possible, as Fortnite can attest, having gathered [12.3 million concurrent users](#) at an Ariane Grande concert held on the platform. As such, digital experiences are inherently becoming more social.

With the metaverse, friends living on different sides of the world can feel as if they are in the same room, watch movies, interactive performances or sports regularly, all without the burden and cost of travel. Workers can collaborate remotely and remove the isolation of working from home. Specialized experts can collaborate from afar, such as the surgeons on different continents who performed a remarkable [operation to separate conjoined twins](#), leading to success that may never before have been possible.



Gaming—not just for fun

The impact of games and gamification on the metaverse cannot be overstated. Just as the business world has increasingly adopted gaming mechanics like rewards and leaderboards, so will the metaverse—but at an even more sophisticated level.

Such activities could be as simple as creating an avatar or earning qualifications in an immersive training environment.

An important aspect of gaming that translates well into the metaverse is its use as a platform for building communities and socializing. The competition and the mechanics behind the games give structure to communities, individual friendships and even professional competitions.

With the rise of esports — another activity that will ultimately take place on metaverse platforms — gaming is becoming ever more of a serious venture, both for those that play and those on the business side.

In many cases, metaverse platforms are built using the same tools used to create games, such as Unity or Unreal, and so both will naturally share some similar feature sets. The ability to create and manipulate digital assets and environments is borne out of functions in video games. So, to get an idea of where the metaverse is headed, keep an eye on future games and the engines that power them.



An ecosystems mindset—don't go it alone

As in today's business world, there will be little room for isolated, play-by-themselves applications in the metaverse. Instead, businesses should build their metaverse applications on existing ecosystems and platforms.

From social platforms like Meta's Horizon Worlds, to Microsoft's enterprise collaboration platform Mesh, Big Tech players are moving to create ecosystems that enterprises and consumers can easily plug into.

While it can be quick and easy to fly solo—i.e., developing a capability that addresses a single use case—it will be almost impossible to scale and, therefore, reap the benefits of metaverse concepts and technologies.

Moreover, if a similar application has already gained momentum on one of the large popular metaverse platforms, it would be difficult, if not impossible, to attract people to it.

Rather than reinventing the wheel, then, it's better to look at the current metaverse landscape and leverage the benefits of an existing platform.

There will be times when the right platform doesn't already exist. In this case, it's still important to build with scalability and integration in mind so that wherever the metaverse may end up, the platform can move with it.



Averting risk, reaping rewards

Four metaverse hazards to avoid

Averting risk, reaping rewards

Four metaverse hazards to avoid

No technology implementation is without its risks, and those risks are only more pronounced when the technology—like the metaverse—is overly hyped and involves major players from Big Tech.

Here are the four biggest risks to avoid when starting your metaverse journey.

Risk 1

It's crypto, bro

Web3—and the many decentralization and democratization technologies and philosophies it encompasses—has an important place in the metaverse. But because cryptocurrency and NFTs are also included in the web3 sphere, this path must be navigated carefully, with due care and consideration for the landscape as it stands.

Much controversy surrounds cryptocurrency and NFTs. While both have a solid technology platform and many practical uses, they are too often applied to the narrow use case of increasing financial value.

This has the effect of viewing web3 technologies as purely a store of value that must be increased. As a result, many metaverse platforms price out users as they require cryptocurrencies to be bought at inflated prices for very little functionality. This, in turn, negates one of the core tenets of web3 around the democratization of the internet, limiting metaverse platforms to the wealthy, the fortunate and, arguably, the digital wrongdoers.

Bottom line: Web3 technologies should only be implemented when they truly create value, not just for the financial benefit of a few token owners.

Risk 2

Virtual ethics are real ethics

As novel as it is to enter your first immersive experience, the behaviors and principles that exist in the physical world are no different from what's acceptable and required in the virtual world. It might seem fun to flail your hands around a friend's face when you first encounter them in the metaverse, but especially as these experiences become more real and immersive, it is as irritating and inappropriate a behavior as it would be in reality.

This is why it's essential for businesses to clarify acceptable and unacceptable behaviors in the metaverse. Doing so will help to ensure that the tools and procedures are in place for staff to feel safe when using work platforms and can also guide the choice of any consumer-facing platform the company builds on. With clear policies in place, businesses can

avoid associating with communities that may do more harm than good to their brand.

Ethical considerations also arise around the ways in which people choose to physically represent themselves in the metaverse. Users are free to choose how they appear, but how much freedom should they be allowed when using a work platform? How should employees represent themselves if they do not identify with their physical body? What if the metaverse platform used does not support an avatar having a specific item of religious attire or physical characteristic that users feel defines them?

The list of considerations is long and complex, but beginning the thought process now avoids larger repercussions in the future.



Risk 3

New data, new security

Collecting personal data in order to sell to third parties has become the *de rigueur* business model for many technology companies. This will only increase as metaverse platforms attract more users, and augmented and virtual reality create a new form of biometric data that will be invaluable. There is, after all, a reason why the biggest consumer players in the AR/VR market are Meta and ByteDance, owners of Facebook and TikTok.

These new data types present challenges and opportunities for businesses entering the space. The opportunity to know your customer at a deeper level—such as the direction in which they're looking at any given moment and who they're standing next to—will mean advertising can become even more targeted and impactful.

On the flip side, this biometric data is deeply personal and, if hacked or stolen, could be used to impersonate users more accurately than previously possible.

Web3 fundamentals of data protection and power decentralization provide some of the answers to these issues, but not all of them. Blockchains are still vulnerable to hacking, and the sheer sums of money involved in cryptocurrencies, though volatile, attract dedicated bad actors looking to scam innocent parties.

The vast amounts of work that go into securing data and the regulation of its use today will be even more necessary as metaverse platforms proliferate. How to do this requires understanding and implementation as part of any exploration into the metaverse.

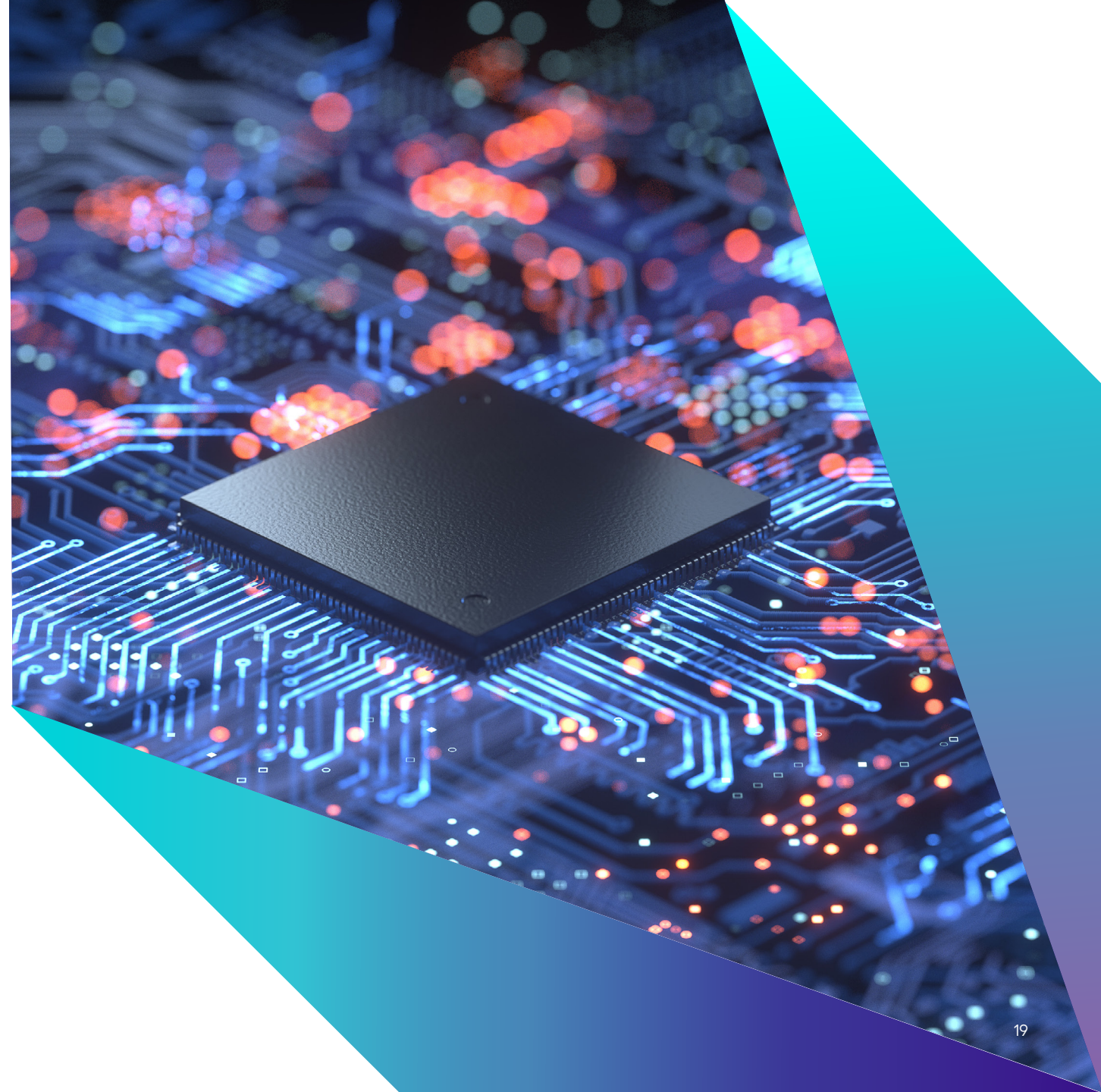


Risk 4

Metaverse overload

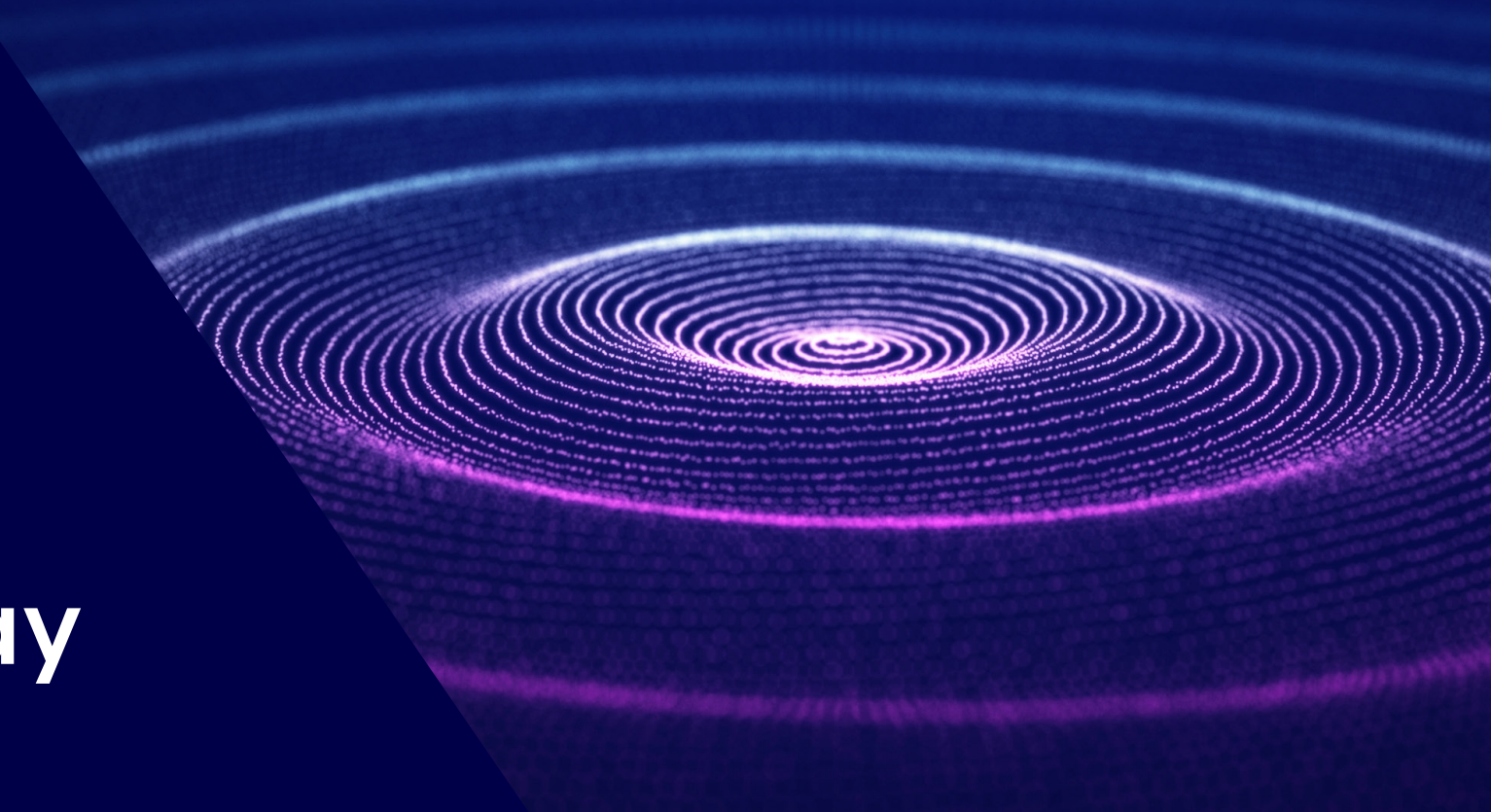
The science-fiction vision of people spending their lives in virtual reality is a dystopian one, not utopian. As much as metaverse platforms and technologies change how people interact with both the real and digital worlds, it is important to still view these as tools for solving problems rather than for creating an all-encompassing monolith for future populations to spend their lives within. Expecting employees to work full time in the metaverse will not yield [results](#), but using it as a tool to aid collaboration and training [will](#).

When targeting consumers, it is equally important to understand that the metaverse is still an extremely nascent area. Attempting to apply the metaverse to each and every interaction with customers will only push them away, but creating experiences and services that are unique to the platforms will prove their worth and ensure long-lasting success and scalability as this virtual world evolves, converges and matures.



How to use the metaverse today

Four business opportunities
with big returns



How to use the metaverse today

Four business opportunities with big returns

It's not enough to just "put something in the metaverse." To generate value, metaverse concepts and tools must be applied to solve real problems or bring about new utility.

The best way to do this is to identify use cases where issues or opportunities exist today and then ascertain how the metaverse components (the technologies and concepts) described above can be used to fulfill these opportunities. Done well and with an eye toward scalability, the components can be layered together to create unique experiences and high value.

Some metaverse components can be applied today, immediately providing business benefit, while others will require either prerequisite components or technology maturation over and above what is currently achievable. The point is that assessing use cases in this way provides an on-ramp to the metaverse today while remaining flexible enough to adapt to wherever the concepts may go tomorrow.

The following are hypothetical use cases in two categories: consumer and business operations-focused.

Each solves a tangible business need and describes how the metaverse and its components can be leveraged, not just in the future but right now, today.



A new place for consumer engagement

01 Make an immersive impression: show off your products and services while building community



Why it matters

Gartner estimates that by 2026, 25% of people will spend at least an hour a day in the metaverse—that is, using metaverse platforms and technologies. This represents an opportunity for businesses to meet these new consumers where they are and begin building interest in their products and services in a tangible way, using immersive experiences and virtual replications, as well as new communities of loyal customers.



How it will work

How it will work: Platforms that use **VR/AR** will provide a unique opportunity to educate, inform and build community through immersive, three-dimensional experiences. By representing products in a virtual space, businesses can give users a true sense of touch, feel and scale—for instance, understanding how furniture will fit and look in their home using AR apps powered by **5G**, or the accurate size of a vehicle.

These virtual representations (i.e. digital twins) can also be interactive. With concepts borrowed from **gaming**, they can offer a tangible, physical experience to remote product experiences that cannot be replicated on a flat screen.

Demonstrating products, or even services, in an immersive virtual space introduces the opportunity for community building since these platforms are shared experiences with **social interaction** at their core. Whether through dedicated spaces for car lovers to show off and explore available models, or forums for socially minded retail consumers, metaverse platforms not only bring these people together, but also attract new members who can interact with like-minded people

Understanding the **ecosystem** will be critical to reaching the target audience. Users of metaverse platforms vary wildly. Roblox for example, is built mainly for a younger, gaming audience, while Spatial targets those with an interest in arts

and culture. As such, platform choice is critical to success."

Web3 can enable businesses to reimagine how customer loyalty can be instilled, such as through tokenization. This involves providing rewards to the communities that form around their products and services that can grant exclusive access to events or services in the form of tokens.

While NFTs today are commonly known for representing money-making schemes with wild price fluctuations, they are also becoming recognized as a mechanism for providing perks and rewards in exchange for customer data and community buy-in.

A new place for consumer engagement

02 Boost your sustainability cred with AR visualization



Why it matters

Businesses that can prove to savvy consumers that they're taking real action on sustainability and social responsibility will drive sustainable growth. Through metaverse components, they can more effectively and convincingly store and share information on product provenance and carbon footprint to brand themselves as environmental, social and governance (ESG) leaders.



How it will work

The green credentials and responsible sourcing of a product's components are just the type of information that is both critical to get across to consumers and difficult to display concisely and engagingly on packaging or a label. **Augmented reality**, through a mobile device today or on a pair of lightweight glasses in the future, frees up real estate to display this information effectively and impactfully.

Users would be able to scan a label or package to see the provenance and sourcing credentials of the product through digital visualization. Applying **gamification** concepts, such as a gaming-influenced user interface, would also help

businesses turn prosaic and possibly cluttered data into an engaging and informative experience.

Web3 technologies such as blockchain can assure consumers of the accuracy and trustworthiness of the information by providing a secured, immutable way of recording transactions and tracking assets through the supply chain. The metaverse principle of **social interaction** can further enable information verification, as it can be crowdsourced to bolster the brand and its product's ESG credentials.

The overall experience will fall flat if shoppers need to repeatedly load new applications on their phone or AR glasses to access the

information, or if the experience is slow and clunky. As such, the **platform and ecosystem** the data is stored on, and the **5G** infrastructure surrounding it, are as critical as the data itself.



A virtual approach to business operations

03 Turn remote work into great work with virtual collaboration, training and digital twins



Why it matters

The recent shift to remote work is just the beginning. Businesses can better support remote workers through immersive training and collaborative experiences that lower costs and onboarding time, provide continuous career development, and introduce new and more efficient business operations through digital twins.



How it will work

Digital twins and virtual recreations of real, physical objects have been around for decades, but metaverse concepts and technologies provide a new way for these to be used as an **ecosystem** for improving business operations.

For instance, the scanning, modeling and recreation of a logistics company's warehouse using the same types of technology that powers **gaming** environments offers up a virtual space that can be used for a number of activities. For instance, accessing a digital warehouse using **VR** can provide a true sense of scale, enabling workers to experiment with more effective layouts and processes in

a virtual space and then applying them in the physical warehouse without business disruption.

Training in a virtual environment is also more immersive, accessible and repeatable, as trainees can access it whenever and wherever is convenient. By incorporating **social interaction**, employees can learn from one another, and remote instructors can guide new hires in a supercharged employee onboarding program. To track the employee's credentials and qualifications earned through the virtual training experience, details can be stored trustlessly on the blockchain, with **web3** underpinning the employee experience.

Warehouses, factories and even offices are becoming increasingly embedded with sensors measuring the environment, machinery and facilities. By using **5G** to feed this information to a digital twin, businesses can create an accurate representation of the real-world object, and the collaboration, training and work done within this metaverse environment can become even more effective and purposeful than what's done in its physical counterpart.



A virtual approach to business operations

04 Create new levels of equipment maintenance, support and operations



Why it matters

On-site data visualization and remote access to operational information introduces a multitude of productivity and efficiency gains, from real-time maintenance monitoring, to providing assembly instructions on the equipment itself.



How it will work

A metaverse **ecosystem** can also enable new levels of real-time maintenance and equipment service.

Using the vast reams of data generated by IoT sensors and streamed via **5G**, factory workers can use **augmented reality** to see real-time data on equipment performance and 3D assembly or maintenance instructions in precisely the correct position, hands-free. This frees them from having to hold a tablet or contact staff in a control hub to get the information they need.

Incorporating the metaverse principle of **social interaction**, remote support assistants can see what **AR**-enabled users are seeing, from their point of view, and inspect the digital twins of the equipment being worked on.

When guiding workers on the steps to take to rectify an issue, they can transmit digital instructions onto the physical objects for them to follow, be they on a factory floor or in the field monitoring of a water pumping station.

Tutorials like these have been a mainstay in video games since their inception. Many years of iterative work has gone into displaying instructions in three dimensions that blend in with and complement the world they refer to, so look to **gaming** to ensure a seamless and valuable employee experience.

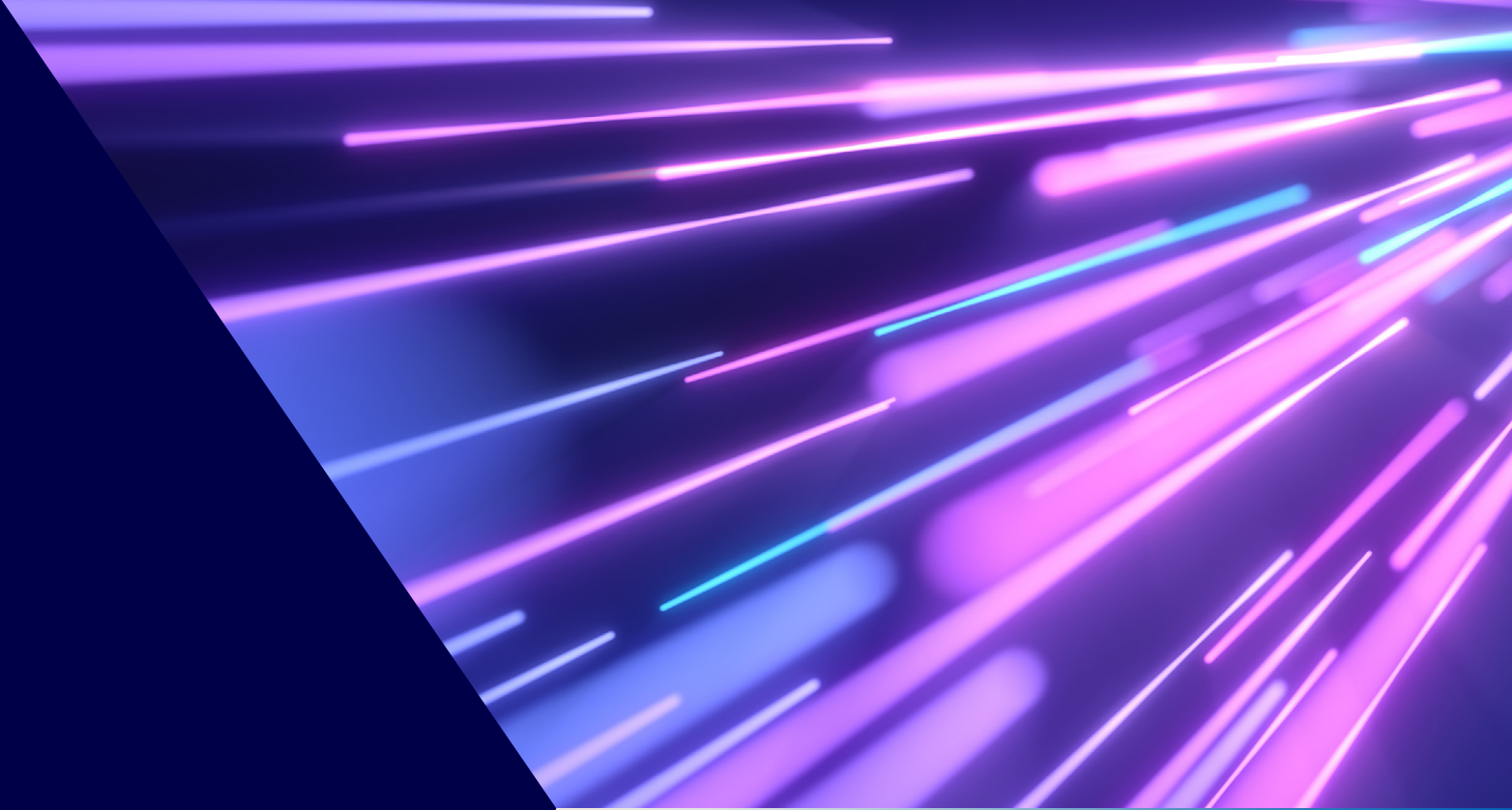
The data generated by IoT sensors can also be collected and stored for sustainability tracking,

which is especially essential for manufacturing, logistics and utilities processes—some of the worst offenders when it comes to generating carbon.

While AR can help workers visualize this data, **web3** and blockchain systems can store and manage it. The decentralization and trust aspects of the technology are important to ensure that what is being reported is accurate, tamper-proof and secure so that it can be shared with third parties without exposing commercially sensitive data stored in back-end ERP systems.



How to get started





How to get started

The metaverse may be an amorphous and loosely defined concept, but by taking the right steps, businesses can build for today while preparing for tomorrow.

A pragmatic—and ultimately successful approach—would be to get started now by taking the following preliminary actions:

- Identify business problems to be solved or opportunities to take advantage of that would benefit from the immersive and augmented experiences of the metaverse.
- Avoid individual solutions if possible and leverage existing ecosystems and platforms, as well as the audience they've already attracted.
- Build scalably, by considering each metaverse component and how they interact with the rest of the platform when creating experiences.
- Maintain the highest level of ethics, privacy and security around this nascent and unregulated advancement in everyone's digital lives.

About the author

Duncan Roberts, Senior Manager

Duncan is a Senior Manager in Cognizant Research. He joined the company in 2019 as a digital strategy and transformation consultant in industries ranging from satellite communications to educational assessment. He has advised clients on utilising technology to meet strategic objectives and discover the art of the possible through innovation.

In 2015, he started developing applications for emerging Virtual and Augmented Reality hardware, working directly with large companies to create new experiences for their customers. He has also advised small startups on using Blockchain solutions for advertising within VR and AR. More recently, Duncan turned his passion for closing the gap between innovation and business opportunity into industry-leading research about the metaverse's impacts on consumers and employees.

Before Cognizant, Duncan worked for one of the largest publishing houses in Europe, playing a leading role in the digital publishing revolution, helping transform their operations end to end and launching new innovative products. He holds a Masters in Philosophy and Classics from the University of St. Andrews.





About Cognizant

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