

# Making the metaverse: What it is, how it will be built, and why it matters



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When Facebook rebranded as Meta last October, it brought into the mainstream a concept that has been exciting the bright minds of Silicon Valley for years: the metaverse. Mark Zuckerberg's unveiling of a vision for a new era of integrated, immersive technologies was met with enthusiasm in some quarters, and cynicism in others. It's easy to see why. Skepticism is a natural reaction to something that sounds like it's straight out of a science fiction novel — in a way, it is — especially when there are wider societal concerns about how tech operates in the two-dimensional world.

Many rightly ask: what is the metaverse and why should I care? And even if I can be persuaded that it is worth getting excited about, how can I trust that these new technologies will be built and governed responsibly?

When Facebook started 18 years ago, we mostly typed text on websites. When we got phones with cameras, the internet became more visual and mobile. As connections got faster, video became a richer way to share things. We've gone from desktop to web to mobile; from text to photos to video.

In this progression, the metaverse is a logical evolution. It's the next generation of the internet — a more immersive, 3D experience. Its defining quality will be a feeling of presence, like you are right there with another person or in another place.

A wide range of technology companies — from big players like Microsoft and Google to smaller ones like Niantic and Emblematic — are already building experiences and products for the metaverse. Early versions of it already exist in the virtual worlds of games like Roblox, Minecraft and Fortnite. It incorporates technologies like virtual reality (VR) and augmented reality (AR) that, while still young, have been in use for some time.

And all of us have a stake in the metaverse. It isn't an idea Meta has cooked up. There won't be a Meta-run metaverse, just as there isn't a 'Microsoft internet' or 'Google internet' today.

The metaverse isn't just about the detached worlds of VR, where we don headsets that take us out of our environment in the physical world and transport us somewhere new. VR is one end of a spectrum. It stretches from using avatars or accessing metaverse spaces on your phone, through AR glasses that project computer-generated images onto the world around us, to mixed reality experiences that blend both physical and virtual environments.

The word 'metaverse' is actually a little misleading, as 'verse' implies you are transported to another 'universe'. Of course, there is escapism inherent in using some of these technologies — like an immersive gaming experience. But the metaverse is much more than that. It's ultimately about finding ever more ways for the benefits of the online world to be felt in our daily lives — enriching our experiences, not replacing them.

Imagine, for example, how useful it could be to wear glasses that give you virtual directions in your line of sight, or immediate translations of street signs in foreign languages. Or even make it possible for you to have a conversation with someone who is thousands of miles away as a three-dimensional hologram in your living room instead of a head and shoulders on a flat screen. And, as I will go on to explain in more detail, the potential societal benefits — particularly in education and healthcare — are vast, from helping med students practice surgical techniques to bringing school lessons to life in new and exciting ways.

As someone in their mid-50s who has spent most of my career in British and European politics rather than Silicon Valley, it wasn't until I started using some of the early products that I started to properly grasp the potential. For several months now my close team has been meeting weekly in Meta's [Horizon Workrooms app](#), in which you interact with colleagues as avatars in virtual meeting rooms, complete with whiteboards, boardroom tables, wall art, and futuristic cityscapes visible through the windows. Yes, we are meeting as stylized representations of ourselves, but there really is something about the sense of place and space, and the directional sound in particular, that makes the meetings feel much more human than talking to thumbnail faces on a laptop.

We can exchange glances and private asides with the person next to us, get someone's attention with a gesture, even read each other's body language — rudimentary as it is when we are blemish free avatars. I can be in my home in northern California talking to a colleague an ocean away in his garage in Milton Keynes, England, and yet it feels like he's sat three feet to my left. If he gesticulates too wildly while disagreeing with me, I get a genuine urge to lean away.

Different technologies will enable different levels of immersion that suit the individual and their environment. They won't be a replacement for our experiences in daily life any more than the internet is today. What they will be is a way to build on the interconnectedness the internet enables, so that we can do more and have even richer experiences. All this has the potential to unlock new opportunities and spark new ideas we haven't yet imagined, and to have a huge positive impact both socially and economically.

For people to actually want to use these technologies, they will need to feel safe. Companies like Meta have a lot of work to do both to build the credibility of the metaverse as an idea, and to demonstrate to people that we are committed to building it in a responsible way. That starts by explaining as best we can what our vision for these technologies is and the challenges we believe will need to be considered as it develops. It means being open and transparent about the work we're doing and the choices and trade-offs inherent in it. It means drawing on existing work to protect marginalized communities online, and listening to human and civil rights, privacy, and disabilities experts as systems and processes are developed to keep people safe. And it means being clear that our intention is not to develop these technologies on our own, but to be one part of a wider technological movement.

The metaverse is at a critical early stage in its development. There is nothing deterministic in the way a technology impacts society. Technology isn't good or bad in and of itself. People will use it as they see fit — and people will misuse it as well. Just as we have seen how problems in our physical society have manifested on the internet, they will reoccur in any system or platform regardless of what it is or who builds it. That is why we must create thoughtful rules and put guardrails into place as the metaverse develops to maximize its potential for good and minimize the potential harms.

Done well, the metaverse could be a positive force for inclusion and equity, bridging some of the divides that exist in today's physical and digital spaces.

Collectively, we can think of this process as developing a system of governance for the metaverse. And it mustn't be shaped by tech companies like Meta on their own. It needs to be developed openly with a spirit of cooperation between the private sector, lawmakers, civil society, academia, and the people who will use these technologies. This effort must be undertaken in the best interests of people and society, not just technology companies.

In this essay, I'll set out why the metaverse is a compelling new evolution of the internet; some of the potential benefits it creates for education, healthcare and economic opportunity; the importance of building it in a way that ensures it is open and interoperable; some early thoughts on how to

approach questions of governance; and how I believe we have time on our side to ensure it is built collaboratively and responsibly.

In doing so, I hope to shed some light on how Meta intends to go about this work. In turn, I hope that a better understanding of our approach will help others — in both the private and public realms — to make informed decisions of their own about what they want in this next phase of the internet.

### **We already have the internet — do we really need the metaverse?**

**E**arlier, I described the metaverse as a logical evolution of the internet. It's worth taking a moment to explain the logic. Since the advent of the internet, we've moved from chunky computers tethered to dial-up phone lines, to laptops and tablets connected without wires, to phones that allow us to carry the internet with us wherever we go, as well as internet-accessible cars, watches and all manner of household devices. This evolution has been driven in part by increases in the speed and availability of internet connectivity. And each step in this evolution has made communication and interaction easier and more natural.

We don't communicate through written words alone, so text-based internet services would never suffice. Static images are an important part of how we communicate, as are sounds and moving images. But we interact in three dimensions. We use multiple senses, body language, spatial awareness. We signify our intention to trust one another by looking each other in the eye, smiling, or warmly shaking hands. We express our feelings towards loved ones not only by saying what we feel but by expressing it physically. We show joy, sadness or anger through nonverbal cues that are embodied and experienced rather than written down.

Advances in speed and availability of connectivity have now reached a point that begins to make many of these three-dimensional interactions possible virtually. It is therefore logical that the next step in the evolution of the internet is one that reflects this.

There are three key factors that will make interactions in the metaverse feel more like those we have in our daily lives: ephemerality, embodiment and immersion.

- **Ephemerality:** In the physical world, most of our daily communications are ephemeral: we speak, people hear us, and no long-term record of what we said exists. In contrast, emails, text messages, and written posts on social media are often persistent, creating a record that lasts over time and which can be inspected, reviewed, modified or deleted. The metaverse will constitute a shift towards live, speech-based communication that will often feel as transient as face-to-face conversations. Just as in the physical world, this kind of ephemeral communication will exist alongside persistent messages and communication, but is likely to be far more common. If I want to communicate with you in today's internet, the first thing I'd do is write text — a post or message, for example. But to communicate with you in a shared metaverse space, I would speak.

- **Embodiment:** In the metaverse we will be able to communicate not only through typing on a keyboard or looking at a screen, but through our physicality. Avatars will reflect our real bodily movements. This will allow us to communicate more expressively, to use our hands to create and manipulate digital objects, and to interact with our virtual 3D environment. This real-time, 3D synchronicity is a crucial difference with the way we interact in today's internet.
- **Immersion:** In the metaverse, we will communicate in ways that make us feel as if we are actually in a specific space with other people — shared environments where social interaction feels natural, like a conversation with friends in a coffee shop, restaurant, or at home. We often talk about getting immersed in a good book or losing ourselves in a song. But no other form of communication has so far been able to achieve the sort of audiovisual fidelity necessary to create the feeling of being in a shared space that is possible in the metaverse.

Empirical evidence from countless social science research studies corroborates this notion that nonverbal/embodied forms of communication are crucial to the cultivation of social trust, and to the development of a shared sense of community with others. For example, in their influential book *Wired for Speech*, Clifford Nash and Scott Brave argue that we evolved to understand the world and to communicate primarily through speech, rather than writing, and therefore functional speech-based interfaces represent an improvement in the way we communicate online.

These attributes — ephemerality, embodiment and immersion — mean people will experience the metaverse in a way that is much closer to physical world interactions than to the experience of using a mobile app or website. In this way, the metaverse isn't analogous to a mobile app like Facebook or Instagram. It's closer to a universal, virtual layer that everyone can experience on top of today's physical world — one where you can have a consistent identity (or even set of identities) that people can recognize wherever they see you.

For this to become a reality, no single company can or should control the metaverse — but different experiences will need to be compatible if, for example, you want to be able to bring a photo you took in one space into another, or to use the same avatar to represent your virtual identity in different places.

### **The possibilities for education, health and economic opportunity**



I appreciate that none of this is easy to visualize. These technologies are nascent. Today, VR and AR are used primarily for gaming, and the often cartoonish experiences that exist right now will no doubt feel quaint in a few short years. The great leap forward that companies like Meta believe is possible hasn't happened yet. Many of the benefits that technologists espouse will be unlocked by advances that are still to come. But they are possible. The technology may be virtual, but the impact it will have on education, healthcare, commerce and much more will be very real.

Think about what it could mean for education and training. The internet has already transformed the way we learn. Search engines make fact-finding virtually instant. We carry around an infinite library in our pockets on devices slimmer than a paperback book. Classes can be taught by video conferencing or live-streaming. The metaverse promises to make learning more active. We will be able to learn by doing and not just passively absorbing information. We'll be able to learn in 3D — bringing the study of architecture, or history, or even basic geometry to life in ways white boards and flat screens never could.

Learning won't be limited by geographical location — a student in Mumbai could attend a seminar hosted by a Professor in Frankfurt; a middle school class in Wyoming could take a field trip to Stonehenge or the Pyramids of Giza. Indeed, they could experience these landmarks as they would have been at the time of the Druids and Pharaohs.

The potential for revolutionizing education and training is one of the things Meta is investing in early through a \$150 million fund called Meta Immersive Learning. One project it has supported is a partnership with [Prisms VR](#), run by a former teacher, to build a virtual Math and Science curriculum for grades 8–12, which is currently being piloted in Ohio with plans to expand to Boston and Los Angeles. Another is [a partnership with Victory XR to launch 10 digital twin campuses](#) — replicas of existing campuses constructed in fully spatial 3D, at colleges and universities in the United States. In these virtual campuses, students will be able to move about, socialize, learn and compete in activities, and take part in classes they can access remotely.

Meta is also providing VR headsets for all the students for use during the course they are taking. This touches on an important point about access to the metaverse. Obviously, anything that is dependent on hardware comes with a cost, and anything that comes with a cost will make it harder, even prohibitive, for some people on low incomes. There will be many low cost entry points to the metaverse — including through mobile phones — but to buy VR headsets some level of cost will be unavoidable. As part of Meta's

efforts to ensure it is actively considering diversity, equity and inclusivity as it works to help build the metaverse, we are determined to make our headsets as affordable as possible.

Another area where metaverse technologies have the potential to be transformative is healthcare. There are endless possibilities for training healthcare professionals — from practicing surgeries without risk to patients or training first responders without putting them in dangerous situations, to making med school more accessible by removing geographical and other barriers. Recent studies have also looked at the ways virtual reality can be used for pediatric pain management, children with autism, and depression.

Augmented reality also has the potential to be transformative. This article suggests nine ways that AR could be utilized: saving lives by showing people where nearby defibrillators are; assisting surgeons during operations; helping new mothers with breastfeeding; helping patients better describe symptoms; helping nurses find veins more easily; showing people how drugs work in 3D; helping medical students visualize anatomy; teaching kids about the human body; and even motivating runners by having them chased by virtual zombies.

Now, think of the economic possibilities. For the last three decades we've been in the midst of a global digital transformation. As more and more people use the internet and connections have become faster and more accessible, businesses and institutions of all sorts have increasingly gone digital to reach them — a trend that accelerated dramatically during the pandemic. Today, the widespread use of digital tools by businesses of all shapes and sizes means the digital economy is absolutely central to the global economy.

The digital economy contributed \$2.1 trillion to the US GDP in 2019. Even if the metaverse went on to account for the equivalent of just 10% of the pre-pandemic US digital economy, it would be a \$200 billion industry, employing somewhere in the region of 770,000 people.

A white paper produced for Meta by the independent economic consultancy Analysis Group has estimated the metaverse economy could be worth more than \$3 trillion globally in a decade.

An industry this massive would also be a job creation engine — and those jobs wouldn't be limited to the campuses of Silicon Valley. In 2020, the mobile technology sector directly employed about 12 million people globally, and indirectly employed another 13 million people. The metaverse economy will not only include the industries that will create its infrastructure, including hardware, software, payment systems, and broadband providers, but also sectors like e-commerce, education, gaming and more which will provide goods and services associated with it. When social spaces are created in the metaverse, people will need to be employed to manage and maintain them, just as they are in the physical world.

For its part, Meta may be based in California but it is a global company with a global workforce. In recent months it has announced the creation of thousands of jobs in Europe and Canada to help build the metaverse, and there will be many more created around the world in the years ahead.

This digital transformation has not only been a boon for the global economy overall, it has also helped to democratize access to it and opened up a new world of economic opportunities. Before the internet, if you wanted to start a business, you needed to get a loan from a bank and have a physical presence on a high street or in an office. If you wanted to advertise, you needed to walk around handing out flyers, or to buy very limited space on a handful of TV networks that charged huge amounts, or in a local newspaper.

When the internet came along, all of a sudden you could start a business without a big loan. You didn't need a shopfront or an office, you could do it from your living room. You could advertise for small amounts of money to targeted audiences of people you thought might be interested in the products and services you provide. The internet and social media have made it possible for people to express themselves, reach like-minded people, and start businesses in ways that simply weren't possible before, which in turn benefited those who have historically been marginalized or discriminated against — women, LGBTQ+ people, those with disabilities, veterans, underrepresented minorities, and others.

We don't know what the metaverse economy will look like yet. But it's hard to imagine the direction of travel will change. The digital transformation will only be enhanced by the metaverse, democratizing access even further and making it a powerful force for greater access and diversity. It will be possible to create more immersive, more social, more detailed experiences than ever before, all from your living room — or your spare room, or garage, or wherever it is you do your Zoom meetings.

In its infancy, no one could have imagined the overwhelming impact the internet would have on commerce. And it is the same right now with the metaverse.

A new generation of entrepreneurs will have much more creative ideas than this, but it's easy to imagine how, say, a fashion designer or clothing retailer could benefit by making their outfits available to be tried on in a virtual fitting room. And there's a huge opportunity for developers — not just for the large developers building for the metaverse today, but for a new generation of independent creative professionals who will be able to access the tools necessary to create amazing spaces and experiences.

### **Ensuring an open metaverse**

**A**s the technologies and their uses develop, guardrails need to be put in place to mitigate the risks and accentuate the positives. So what sort of guardrails are required for these new forms of immersive and immediate social interaction? And who gets to set the rules?

The metaverse is not a single product, in the way Meta's apps — Facebook, Instagram, Messenger and WhatsApp — are. Nor is it an operating system like Microsoft's Windows, or hardware like Apple's iPhone. Like today's internet, the metaverse will be a constellation of technologies, platforms, and products. It won't be built, operated or governed by any one company or institution. It will take a range of companies large and small, civil society,



the public sector, and millions of individual creators. It isn't a single piece of cloth, but a patchwork quilt.

Given the varied mix of companies, institutions and people who will operate spaces in the metaverse, the rules for what happens in them will be set in a variety of ways. The scholar Helen Nissenbaum coined the phrase 'contextual integrity' to describe the way norms and expectations around the sharing of information differ depending on social context. In her book *Privacy in Context*, she gives the example of your relationship with your doctor — a situation in which you are prepared to share information you likely wouldn't choose to share with your friends. When it comes to making content policy rules, one size is not going to fit all — there will be different expectations, and therefore different rules and norms established, in different spaces.

Of course, like the internet, the metaverse will be an interconnected system that transcends national borders, so there will need to be a web of public and private standards, norms and rules to allow for it to operate across jurisdictions.

One way to think about the structure of the metaverse is to imagine a building, where each floor supports the one above it. For each floor, and within each floor, there will be different kinds of rules and regulations required.

#### *Foundations — hardware, protocols and standards*

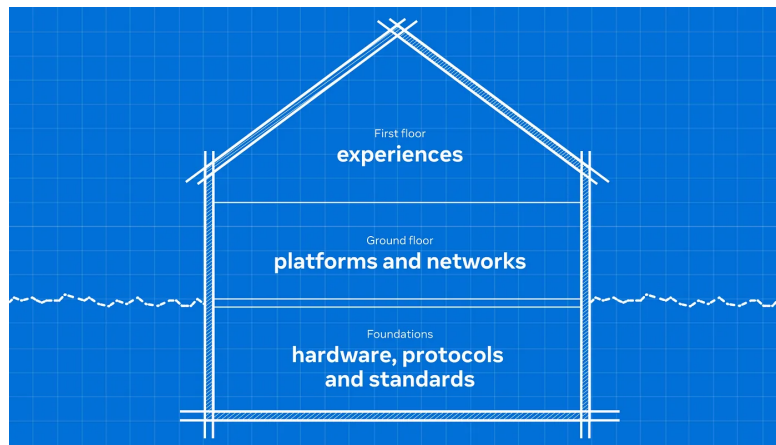
The foundations of the building include the hardware — phones, VR headsets, AR glasses, etc.— and the technical protocols and standards that ensure the various technologies can interact, or be 'interoperable' in the jargon.

#### *Ground floor — platforms and networks*

The ground floor of the metaverse will be built on top of these interoperable protocols and standards. This is the intermediary layer where platforms, institutions and other networks will create the universe of products that make up the 3D worlds of the metaverse.

#### *First floor — experiences*

The first floor of the metaverse is where you'll access it as a user, and where the vast array of experiences will be available. Current Quest users, for example, can access the metaverse through social VR apps like Horizon Worlds. Apps and experiences will support the ability for creators to design a multitude of unique spaces.



The common theme across these floors is **interoperability** — the interconnectedness of standards, systems and applications that enable people to travel seamlessly between one part of the metaverse and another. It isn't an absolute — not every element of metaverse experiences needs to be, or will be, compatible with others. But without a significant degree of interoperability baked into each floor, the metaverse will become fragmented and broken into silos, each impenetrable from the other.

As has been the case throughout the internet's development, interoperable standards and protocols will be developed by different people and companies over time, and will often be settled by institutions like the US-based National Institute of Standards and Technology or international multi-stakeholder organizations like the Internet Engineering Task Force or the World Wide Web Consortium.

An example of interoperable standards is the HTML language that developers use to build websites, and which all internet browsers can read. Common hardware standards are things like USB ports that allow different devices to connect together. These are crucial because they provide a common foundation that allows seamless communication across different devices and platforms.

Because the ground floor's platforms and networks will be built on this foundational layer, they will have the potential for interoperability. Of course, there's nothing inevitable about individual companies adopting industry-wide standards, but they will have a strong incentive to align on ways for consumers to take digital goods such as clothing for avatars from one platform to another.

For those who think the risk of a fragmented metaverse is theoretical, look what has happened in the current internet. We have two operating systems that effectively create walled gardens — and in Apple's case, a walled garden that is increasingly vertically integrated. As interoperability develops it needs to be driven by the interests of users, so that they are not randomly locked into one silo or another.

Its development will likely follow the same path as the existing internet — piece by piece, standard by standard, driven by a mixture of public and private initiatives.

Take the history of an internet technology that is commonplace today: the Graphics Interchange Format, or GIF for short. Up until the late '80s, each

computer manufacturer would develop their own proprietary computer language for displaying images on a screen. This, in turn, made sharing images between different computer brands a technologically challenging task. In 1987, Steve Wilhite, a programmer who worked in an online service company called CompuServe, came up with a universal image sharing computer language — GIF — that revolutionized the process of sharing images online. From then on, the images that users shared on CompuServe's network would be readable by any computer, no matter the brand. Wilhite's innovation, which was formed on the idea that we need a common interchangeable computer language to share information between devices, helped pave the way for the next generation of the internet, which was centered around the sharing of images rather than just text.

Other internet technologies have longer and even more complicated histories than the GIF. Email, for example, has a history of more than fifty years of technical standards evolution. And the list goes on: sharing a video, creating a webpage, even texting someone, requires the development and adoption of a common technical language. Today, the internet is open and accessible to billions of people because of the work of standards-setting bodies like the IETF or the W3C, the innovations of luminaries like Vint Cerf and Bob Kahn who developed the TCP/IP protocol, government projects like ARPA, and the creations of companies like CompuServe.

We should have the same expectations of openness and universal access for the metaverse. It will need to be developed from the ground up by a new generation of developers like Steve Wilhite; driven by a mixture of private and public initiatives that will develop and help adopt interoperable standards over time. This is a case made powerfully in an essay by Matthew Ball and Jacob Navok, espousing the virtues of what they call 'Interchange Tools and Standards' in the metaverse:

*The Metaverse will not develop as the internet did. Public institutions, military research labs, and independent academics led the latter's development because they were effectively the only ones with the computational talent, resources, and ambitions to build a World Wide Web, and few in industry understood its commercial potential. None of this is true when it comes to the Metaverse.*

*But we still want the Metaverse to flourish as the internet did. We want as many new platforms, technologies, and companies to be created — to maximize the number of Metaverse users, and the devices it reaches — while also checking the rent-seeking instincts of dominant platforms. To do so, we will need an ecosystem of 'interchange' solutions that interconnect, translate, and exchange information/users/assets across and between myriad different and competing platforms. It's not enough to have more powerful hardware, computer, networks, virtual platforms, and Metaverse tools and technologies.*

Interoperability isn't just an abstract technical idea. It will be crucial to people's experiences in the metaverse. Imagine, for example, that two friends want to go together to a concert taking place in Horizon Worlds. If they both click the link to the concert venue from different starting points, there will need to be a common protocol for travel to ensure they can end up at the same place in the metaverse.

If they buy a t-shirt at the concert, they'll want to be able to take it with them and not just be limited to wearing it in Meta-built experiences. To do so will require digital items created in different places to be compatible and

accessible across metaverse spaces, just as photos or other images can be used to display images across websites, social media apps and devices designed and operated by different companies. Digital items for avatars — or any 3D objects that someone might wish to take with them throughout the metaverse — will need to be like GIF or JPEG image files in today's internet.

A metaverse that is open and interconnected is not only the right thing for users — and something that will involve both technical and policy work from industry and regulators — it is also the sort of thing that might come to distinguish the metaverse in the parts of the world that still believe in an open internet from the metaverses built in other parts of the world where a closed internet has been constructed in recent years.

The borderless and largely free internet that you and I use every day is being challenged in many parts of the world by an alternative model: the authoritarian internet. Some governments are building digital barriers at their borders and imposing greater control over the internet inside them, creating rules and infrastructure to monitor and censor users, and partitioning the internet into a series of national and regional silos.

This is how the internet operates in China, and others are moving in this direction. Not least Russia, whose actions in the weeks following its brutal invasion of Ukraine accelerated its own divorce from the global internet — restricting or blocking social media services, clamping down on the media and the free expression of its citizens, and cutting them off from the world beyond Russia's borders.

The rise of the authoritarian internet represents an ideological challenge to the open internet as we know it. That's why, with investment in metaverse technologies happening all over the world, the values which underpin how these technologies are constructed are as important in this coming phase of the internet as they are in the current one. While ideas like interoperability may sound dry and arcane to non-technical ears, they matter because ensuring the fundamental architecture of the metaverse is as open and accessible as possible will have profound implications for how we experience it for generations to come.

### **What sort of rules do we need?**

**T**he rules and safety features of the metaverse — regardless of the floor — will not be identical to the ones currently in place for social media. Nor should they be. In many ways, user experiences in the metaverse will be more akin to physical reality than the two-dimensional internet.

For example, you and I might create a metaverse space — like a virtual living room — where we can get together with a small group of our friends to hang out, chat, gossip, and generally put the world to rights in the way we all do when we catch up with friends. It won't be a public space where anyone can turn up and join in, just a private space for friends. We will be the architects of our space and we will decide how it's used — just as we can invite people into our homes for private conversations in our living rooms. In this situation, we wouldn't want or expect a private company to be listening in on our conversation, in the way that we would expect a social media company to see our conversation if we were posting on Facebook or Twitter.

Of course, the unique characteristics of the metaverse will contribute to negative as well as positive experiences. For example, a sense of immersion can heighten the emotional impact of offensive or aggressive interactions that would probably be less affecting in a 2D, text-based environment. One measure Meta has taken with this concept in mind is the introduction of a personal boundary around one's avatar, which is intended to create personal space for each user, so that their safety is better protected.

But formal rules and built-in functions will only ever get us so far. In the physical world, as well as the internet, people shout and swear and do all kinds of unpleasant things that aren't prohibited by law, and they harass and attack people in ways that are. The metaverse will be no different. People who want to misuse technologies will always find ways to do it.

The current debate about how to handle bad-but-not-illegal conduct on social media and the internet hints at the debates to come about how to treat anti-social behavior in the metaverse.

Companies and developers will have to create new formal rules for their spaces. While some may be readily developed based upon lessons of the internet, others will be new and evolving. And as in all societies, informal and unwritten codes of acceptable behavior will also develop over time. In many cases, the operators of the apps and creators of experiences will want to nurture the development of healthy norms rather than falling back on exhaustive and impractical lists of what users can and can't say or do.

Consider a scenario in a more public metaverse space than our private living room. Two friends — let's call them Bhavika and Elijah — meet in a virtual bar in the metaverse. The bar owner, a 23-year-old developer from Sweden, has set very clear rules of conduct which are displayed to every customer before they enter: everyone is welcome as long as you are over 21; you can say anything you want; but no physical aggression, however small, is allowed. Anyone who violates these rules will be kicked out.

Bhavika and Elijah like the idea of open and free conversation that this bar promotes, and they've heard it's a place where new and radical political ideas are debated. When they enter, however, they quickly realize that the heated conversation taking place at that moment involves an uncomfortable amount of abusive language. Disliking what they see and hear, they decide to leave the place and report their experiences to the company that hosts the virtual bar's data on its servers.

Who is responsible for Bhavika's and Elijah's experience? What are the bar owner's responsibilities? And what are the rules that should be imposed by the company that hosts the bar's data?

Answers to these questions will most likely deviate considerably from the sort of rules imposed in the internet world — like a social media platform's community standards — not least because this situation involves live speech rather than posted text. In fact, the immediacy of metaverse spaces makes it more likely that this sort of synchronous, ephemeral communication will be far more prevalent than the tangible, text-based communication that dominates much of today's internet. So, in this case, a better place to look for answers may be the existing rules and norms that govern bars in physical reality.

For example, in the US, we wouldn't hold a bar manager responsible for real-time speech moderation in their bar, as if they should stand over your table, listen intently to your conversation, and silence you if they hear things they don't like. But the bar manager would be held accountable if they served alcohol to people who are under-age. We would expect them to use their discretion to exclude disruptive customers who don't respond to reasonable warnings about their behavior. And we would expect customers who were upset by aggressive or inappropriate speech to be able to speak to the manager about it, and for some kind of action to result.

In metaverse spaces, we could reasonably expect to be able to report this behavior without the need for our conversations to be stored indefinitely on a company's server. For example, for Meta Quest users in Horizon Worlds, a rolling buffer is available so that most audio data can be kept for just a short period — for privacy reasons this is kept on the device, not Meta's servers — to ensure it is available for users to report abuse or harmful conduct. If they don't submit a report the data is deleted. As well as reporting, they also have the option to block or mute people, as well as being able to leave the space immediately via the Oculus button on their controllers.

A great example of a company taking a thoughtful, context-driven approach to issues of negative behavior online is Good Game Well Played, led by Dennis Fong, a gamer and entrepreneur who created his AI-powered moderation platform to help games publishers respond to user reports. Its player report management system aggregates, triages, and prioritizes player reports and provides context around incidents by displaying historical and holistic data on the players involved, including their reputation scores, credibility rating, and the severity of the incident.

### **Time is on our side**

**T**his is all futuristic stuff — but as with all major technological advances there are going to be big challenges and uncertainties. In the past, the speed with which new technologies have emerged has sometimes left policymakers and regulators playing catch-up. Companies get accused of charging ahead too quickly, while innovators have felt that technological progress can't afford to wait for the slower pace of regulation. Guardrails around new technologies were at times retrofitted with the plane already in full flight. Cars were on the road for decades before regulators made seatbelts mandatory.

That doesn't have to be the case this time round. The technologies being described are certainly no less ground-breaking. The crucial difference today is that time is on our side. It may not always feel like it when so many different companies are talking up these technologies and announcing new products and initiatives. But these innovations aren't going to happen overnight. We're in the early stages of this journey. Many of these products will only be fully realized in 10–15 years, if not longer.

While that's frustrating for those of us who can't wait to use them immediately, it has the great benefit of giving us time to ask ourselves the difficult questions about how they should be built. It gives Meta — and every company innovating in this environment — the space to invest in research and work in close collaboration with industry peers and experts on many of these important issues.

There are many challenges in ensuring the metaverse is designed to maximize opportunity for all. First, industry must come together around shared technical standards that allow the metaverse to be interoperable. Second, and significantly more difficult, is determining to what extent there are shared rules of behavior for users across the metaverse.

Given that the metaverse much more closely mimics physical life, with all its complexities and nuances, how should we think about where the line is drawn in terms of formal rules for what behavior is and isn't allowed — whether enforced by government or industry? What tradeoffs exist in content-focused rules? How do we ensure they are not used to further stigmatize or surveil historically disadvantaged communities? At what level are these things best decided — platform-wide, or in individual communities? And given the technical challenges, what level of standards is realistically achievable?

By working together from this early stage across industry, the public sector, academia and civil society, I hope that we can begin to answer these questions as these new technologies are built, and ensure that the enthusiasm for the potential of these technologies is accompanied by a rigorous focus on developing them collaboratively and responsibly.

To that end, Meta has set out a number of priority areas that will guide our work:

- **Economic opportunity** — how we can give people more choice, and maintain a thriving digital economy.
- **Privacy** — how we can build meaningful transparency and control into our products.
- **Safety and integrity** — how we can help keep people safe on our platforms and give them tools to take action or get help if they see or experience something they're not comfortable with.
- **Equity and inclusion** — how we can make sure these technologies are designed inclusively and in a way that's accessible.

These priorities build on a set of [Responsible Innovation Principles](#) that Meta's Reality Labs first set out in 2020 to underpin our product development work.

Meta will be working across the industry, and with experts from all sorts of different fields to develop these technologies, and to enable others to do so. In particular, we need to ensure that industry standards or regulations are inclusive of the concerns of the civil rights and human rights communities so these technologies are built in a way that's empowering for everyone.

The World Economic Forum is taking a leadership role in this space by creating a multi-stakeholder network to inform future best practices and governance principles on key societal, ethical and governance challenges involving the metaverse. In particular, it will look into issues around equity, inclusion and accessibility, privacy and safety, economic opportunity and interoperability. This is similar in spirit to the work the WEF recently launched on [quantum computing principles](#).

Many will understandably be skeptical about the idea that erstwhile competitors like Meta, Google, Microsoft and other tech firms, big and small, will really be prepared to work together in this way. But it is

happening already. One forum for cross-industry co-operation is the [XR Association](#), which brings together companies working across the whole spectrum of metaverse technologies — from headset manufacturers and technology platforms, to companies that build components, internet infrastructure, enterprise solutions and more.

Evidence of the XR Association's commitment to grappling with some of the thorniest issues can be found in a [new report](#), published last month in partnership with the think tank the Bipartisan Policy Center. As well as unpacking some of the serious concerns people have around issues like privacy, safety, inclusion, access and security, the report identifies a series of gaps in US law and public policy that will need to be addressed in the years ahead. These include policies around government-backed research and development, procurement and financing, workforce training, and digital infrastructure, and laws around privacy protections, civil rights, and tort and labor laws.

Meta has also made direct investments in external research and programs through its \$50 million global [XR Programs and Research Fund](#). This includes facilitating independent external research with [Chuo University in Japan](#) (on improving foreign language teaching and learning), [Seoul National Intelligence & the Law at the National University of Singapore](#) (on topics such as privacy and data use), and Australia's [Project Rockit](#) (on young people's perspectives of their relationships with AR and VR and how to create safer online social communities).

In Latin America, with [C-Minds Eon Resilience Lab](#) in Mexico (economic opportunities, privacy and security, safety and gender), [Fundación Universidad de San Andrés](#) in Argentina (ethical and Human Rights challenges in immersive technologies, with particular focus on safety & gender), [Instituto de Tecnologia e Sociedade](#) in Brazil (identifying and informing opportunities and challenges of metaverse innovation in Latin America) and [The Institute for Research on Internet and Society](#) in Brazil (on privacy and data protection in immersive technologies).

Through the fund, Meta has also invested in a number of initiatives with partners around the world, like the Organization of American States on job training and skills development for students, creators and small business owners, [Women In Immersive Tech](#) to support women and underrepresented groups in Europe's VR, AR and MR sectors, and [Africa No Filter](#), [Electric South](#) and [Imisi3D](#) to support creators who have been pushing the boundaries of digital storytelling using immersive technology through an initiative called Amplifying African Voices.

In the US, Meta is partnering with [Jobs for the Future](#) to demonstrate how AR/VR technologies can strengthen the competitiveness of small- and medium-sized businesses by upskilling workers, particularly those who have been disadvantaged in the labor market.

The intention of these sorts of initiatives is not to somehow spin away Meta's own responsibilities. They are attempts to engage early and often with independent experts, academics and civil society on some of the areas where foundational work needs to take place in order to ensure these technologies are developed responsibly.



Nobody wants big tech companies to plow ahead without thought for the impact of their advances on society, nor do they want them to do all the thinking themselves behind closed doors. Initiatives like these are necessary but nowhere near sufficient. They are the first steps in a long journey that will only be effective when we all come together to agree on enforceable rules and industry-wide standards.

**T**he metaverse is coming, one way or another. The future of the internet will be more *human* than the way we experience it today — more physical, interactive, and speech-based than flat screens filled with text and images.

It won't be ownable, by Meta or anyone else, just as today's internet isn't. Meta has been upfront about the role it hopes to play in developing and establishing these new technologies, and how it is investing heavily to make them a reality. But it is being equally open about the manner in which it wants to go about developing them: collaboratively, transparently, and in full recognition of the social responsibilities inherent in the endeavor.

The metaverse will bring with it huge potential for social and economic progress. And it will bring risks and challenges, many of which can be anticipated. Our hope is that the lessons of previous technological advances can be learned, and that the rules, standards and norms that will govern the metaverse can be developed in tandem with the development of the technologies themselves.



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