THE FUTURE

HOW THE METAVERSE, WEB 3.0, AND BLOCKCHAIN WILL TRANSFORM BUSINESS AND SOCIETY

INTERNET

BERNARD MARR

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*To my beautiful wife Claire and
our three wonderful children Sophia, James, and Oliver,
thank you for filling my life with love, joy, and endless inspiration.*

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INTRODUCTION: A WHOLE NEW INTERNET

Web1, the first evolution of the internet, gave us the static websites of old and a world that (seemingly) revolved around Google. The second phase, web2, gave us a much more participative internet, characterized by user-generated content (bloggers, YouTubers, etc.) and driven by social media giants like Facebook and Tencent.

Welcome to Web 3.0

Now we're entering the third evolution of the internet, in which life online will become more immersive and decentralized. Immersive thanks to metaverse technologies such as virtual reality and metaverse platforms that provide immersive gaming and social experiences. Decentralized largely thanks to blockchain and crypto-driven platforms that give more power back to users—and challenge established powerhouses such as Google, Meta, and even financial institutions.

This is interchangeably referred to as web3 (or web 3.0) and the metaverse. I like to call it the *future internet*. Because that's exactly what it is, the future of the internet. This new evolution of the internet will give us a much more immersive, engaging digital experience, where the lines between the real world and the virtual world become even more blurred than they are today.

This is a huge transformation for us as individuals, for businesses and for the world at large. And, as you'll see in this book, it's already underway. A lot of investment is being poured into the metaverse and web3, and tons of exciting use cases are emerging. Use cases that show how organizations of all kinds are embracing web3 and the metaverse to build deeper connections with their customers, develop new products and services, improve the employee experience, streamline business process, and more. The road to this promised future internet is already being paved.

But Where Is That Road Heading?

My job is to look ahead. Not into a far-off dystopian future. I'm not going to tell you that robots are coming for your job and we're all going to end up trapped in the Matrix, as human batteries for our machine overlords. I'm here to provide an enticing glimpse of the near future, with a realistic business hat on. Together, we'll look at the developments that are already underway, and how these are likely to impact businesses and our world. That said, it's rather hard to predict the future when new technologies are emerging and changing so fast.

To some extent, it's easier to predict where the metaverse is going because we've been building towards a more immersive internet for quite some time (consider the evolution of gaming platforms like Fortnite, which have transformed themselves into immersive worlds where people come to hang out and attend events, not just play the game itself). Web3 is a slightly different kettle of fish, as we say here in the UK. Blockchain, and especially NFTs (don't worry, we'll get into the technical definitions later), are relatively new. What's more, this notion of decentralization represents such a huge shift away from traditional power structures—not just in terms of technology companies, but financial structures, organizational structures, and more. And not everyone will be on board with such a dramatic shift. Some very powerful organizations and systems are under threat and will, no doubt, challenge aspects of the future internet. Which is partly why it's difficult to predict exactly where all this is headed. There are many

moving parts. Plus, new innovations will come along that haven't yet been invented. It's a time of flux and anticipation. Challenges and excitement.

We can see, however, that brands are already doing amazing things for the future internet, such as creating digital-only products, enhancing existing products with cool digital add-ons, recreating physical events and spaces in virtual worlds, and delivering highly engaging virtual experiences. This book showcases many examples of the future internet in action. Yet I also know that, for the most part, future internet use cases will be defined and built by the people reading this book. You, your organization, and your competitors will create the future internet.

And you must. Believe me when I say you can't afford to ignore the impact of the future internet. Because more and more people want to spend their time—and their money—in virtual worlds. My teenagers and their friends are only too happy to spend their pocket money on digital accessories for their gaming characters. Products that don't exist in the real world. This is the next generation of consumers, and they're hungry for digital products and immersive virtual experiences. For younger generations, there's no meaningful distinction between the physical world and the digital world. Reality and simulation merge together. I mean, what is reality anyway? Is an enjoyable virtual experience any less valuable, any less "real", than a physical one? It's all experience. And, increasingly, our experiences will take place in virtual settings—from hanging out with friends, to shopping in virtual stores (much better than the traditional, boring online shopping experience if you ask me), to going to gigs.

What to Expect from This Book

This book outlines an enticing vision of a whole new internet, built on the principles of immersiveness and decentralization. In the first part of the book, we'll look in more detail at how this future internet will take shape and explore the technologies that are driving this transformation. In the second part, we'll see how the future internet will transform various

parts of our economy and society—looking at some of the industries that are seeing the biggest changes at the moment. This is where we'll look at sectors like finance, manufacturing, healthcare, education, and so on. But I recommend you read all these chapters, not just those that relate more closely to your own work, because many of the examples will translate to your own sector. And finally, in the third part, we'll look at how you can leverage the future internet in your own organization—for example, by rethinking your products and services and enhancing your business processes with the metaverse and web3 in mind.

I hope this book inspires and motivates you to get ready for the future internet. Incredible innovations are coming our way and I can't wait to see how the future internet evolves.

PART I
THE FUTURE INTERNET AND THE NEXT DIGITAL REVOLUTION

The future internet will give us a much more immersive, engaging digital experience, while at the same time giving more power back to users, largely thanks to decentralized platforms and blockchain technology.

In this part, I explore these two core facets—immersive and decentralized—in more depth to uncover what the future internet might look like. Starting with a new era of immersiveness.

CHAPTER 1
THE METAVERSE AND A MORE IMMERSIVE ONLINE EXPERIENCE

Welcome to a day in the life of you. Future you, that is. You begin your working day with a virtual team meeting—with realistic avatars of you and your colleagues gathering in a virtual meeting space to discuss your newest project. There's a gorgeous mountain scene outside the meeting room window, even though you're in Birmingham or Boston, or wherever you are in the real world. At lunchtime you go for a walk in your local park and see a dog walker wearing a jacket you like. Your augmented reality sunglasses tell you the brand, product name, and price. So, you hop on your phone and have your shopping avatar—which matches your measurements perfectly—"try on" the jacket in the store's virtual changing room. (It looks great on you, by the way. You should definitely buy it.) Back in your home office, you spend the afternoon collaborating with a remote colleague on a new product design, exploring different options in 3D format, "walking around" the design to explore it from every angle and manipulating it to your specifications in front of your eyes.

After work, you and your partner have your weekly virtual reality (VR) tennis lesson. Then, because you're renovating your home, it's time to decide on a new bathroom suite. So, you head to the DIY store's app, which uses augmented reality (AR) technology to digitally place different

bathroom suites in your room. You spend a happy half-hour "placing" lots of different bathtubs, sinks, and showers in your bathroom, seeing which fit and generally weighing up which look best. It's so much easier than heading to the store with a measuring tape, as you did with your first home. Later, you don your VR headset to catch up with a friend who recently moved to the other side of the country, meeting in an online platform and watching your favourite band play a virtual gig together.

Okay, maybe a day in the life of future you won't be exactly like this. But it's a taste of what I mean by a more immersive internet—that is, an online experience that is more realistic (seeing things in 3D rather than 2D, for example) and generally more engaging. And at the heart of this immersive, realistic, engaging internet lies a key concept: the metaverse.

How the Metaverse Will Change Our World

I have a confession to make. I don't love the term "metaverse". It just makes most people think of Meta (formerly Facebook Company). And for others, they think it's all just about virtual reality and living in a fantasy virtual world, like in *Ready Player One*.

But the metaverse is so much more than that. Or rather, it will be. For me, the metaverse represents the future merging of digital (i.e. online) activities with virtual (i.e. simulated) worlds, and, yes, the physical world around us. The metaverse will make the digital world and virtual experiences more realistic, more immersive, and, dare I say, more human. Social media companies, brands, employers, schools, and individuals will operate their own virtual worlds where people can come and work, learn, game, exercise, or just hang out. For this reason, I'd argue that the metaverse will end up *bigger* than the real world.

But the metaverse will also make the physical, real world around us more accessible, exciting, and interactive. That's a crucial point to

understand—the metaverse isn't just going to revolutionize our experience of life online; it'll change how we view and interact with the real world around us. Experiences in the real world will be more exciting because of the metaverse. Whether it's choosing a new bathtub, going on a walk, buying clothes, or whatever.

But I'm getting ahead of myself. What actually *is* the metaverse?

A beginner's guide to the metaverse

The metaverse concept is all about persistent, shared virtual worlds. Mark Zuckerberg, who says he's been contemplating the metaverse since before he came up with Facebook, describes it as an "internet that you're inside of, rather than just looking at", which is a brilliantly concise description. (Although it does neglect how the metaverse will influence the real world around us.)

In these shared virtual worlds, we'll theoretically be able to *do* and *be* anything we want. We can take on whatever personality or form we want, or just be ourselves. We'll be able to work and socialize with people on the other side of the globe in a way that's more realistic and engaging than Zoom calls or social media chats. We'll enjoy a better online shopping experience. Gaming will be more immersive and realistic than ever. More gigs will take place in virtual spaces. Students learning remotely will feel like they're in the lecture hall with their teacher. And so on, and so on. Basically, thanks to the metaverse, more and more of everyday life will take place in shared virtual worlds—and these worlds will feel much more engaging and immersive than our current experiences of, for example, going online, using social media, or VR gaming.

The concept of the metaverse has existed for a while. In the *Matrix* movies, where humans are locked into a shared virtual world created by machines, that's essentially a (disturbing) depiction of a metaverse. The same with *Ready Player One* (a book and film in which people take refuge from our dystopian future world in a massive online role-playing game and virtual

society, complete with its own currency), and the countless other stories, movies, and shows where people spend their lives in virtual worlds. So, it's not a new concept invented by Mark Zuckerberg, despite Facebook's clever rebrand to Meta. (In fact, the term "metaverse" first appeared in Neal Stephenson's 1992 cyberpunk novel *Snow Crash*.) This is a concept that society has been building towards for a while—ever since the emergence of the internet, social media, virtual reality, and early attempts at creating shared digital environments, like Second Life (the online 3D environment where users engage in an alternative life and assume an alter ego).

Many experts—myself included—believe the metaverse will be integral to the next evolution of the internet. It will *be* the next generation of the internet.

If this all sounds a bit exaggerated, consider how many people have found themselves living more of their lives online since the COVID-19 pandemic. We're becoming increasingly used to working, learning, shopping, and socializing online. In recent years, the Fortnite gaming universe has expanded so much it now hosts social events and huge concerts, featuring stars like Ariana Grande. So, the idea of bringing all these strands together as "the metaverse" is not such a wild leap after all. Sure, it's not going to happen overnight (more on this in Chapter 3), but it is going to happen.

Is this the same as the multiverse?

No, the metaverse isn't the same as the multiverse, although you'll hear both terms bandied around a lot these days.

In tech language, the *multiverse* is an ecosystem of many virtual worlds. The Fortnite game is a good example of such a virtual world—one that's expanded beyond pure gaming to a virtual hub where people come to hang out with others or be entertained. Platforms like Fortnite are part of a new multiverse era that's emerging in the tech world, largely driven by gaming (which makes sense when you think about it, because the gaming

industry has loads of experience of creating immersive virtual worlds). According to TechCrunch's Eric Peckham, "Multiverse virtual worlds will come to function almost like new countries in our society, countries that exist in cyberspace rather than physical locations, but have complex economic and political systems that interact with the physical world". But, crucially, these virtual worlds in the multiverse aren't (yet) interconnected. They're separate "countries" that you can visit, if you will.

The *metaverse* concept is different because it will be a *persistent, shared* digital environment. You'll—in theory—be able to move from activity to activity and environment to environment and take your avatar, preferences, and digital assets with you. So, while the multiverse is fairly disconnected, the metaverse will—in the future—offer a connected virtual world with a unified user experience, whatever you're doing and wherever you're going. So, if the multiverse is like a collection of separate virtual countries, the metaverse will be more like a virtual European Union, where you can seamlessly travel from country to country, taking your one currency with you.

In the future, some or all of these disparate virtual worlds—such as Fortnite—may well become interconnected parts of the metaverse. That's the ultimate promise of the metaverse.

Interoperability is key

Importantly, then, your future metaverse life won't be limited to one platform, like Facebook or Fortnite. Rather, it's all about enjoying a shared, continuous experience. So, you may move from an immersive VR game, to a work meeting in a 3D meeting space rendered on your laptop screen, to 2D applications on your mobile phone (shopping, for example). But all the while, you'll be able to enjoy continuity between the different activities and environments, in terms of your preferences, the avatar (or avatars) you control, and the general user experience. In other words, your data would carry over from area to area and activity to activity. The same with

any digital assets you own (e.g. if you buy clothes for your digital avatar). This "interoperability", as it's known in the tech world, is crucial to the creation of *persistent* and *shared* worlds.

What about the physical world (and the human experience, for that matter)?

Earlier in the chapter, I said that the metaverse will change the real world. What do I mean by that? For the most part, I'm talking about the physical world around us being "augmented" digitally, with AR technology.

If you've ever played Pokémon Go, where you see Pokémon characters around you in the real world, you get the basic idea of how AR can enhance the real world around us. Another fun example is Google Search with AR—if your phone has AR technology, try Googling "dinosaurs" and you'll be able to see AR dinosaurs appear in your room. The AR technology that underpins Pokémon Go and Google's augmented search function will be a cornerstone of the metaverse. (I talk more about key metaverse technologies later in the chapter.)

So, in the real world in future, you might wear AR glasses that display digital information on the lenses as you walk around, or the apps on your phone will overlay digital images on top of the real world. Or, say you work on an assembly line in a factory, you might wear an AR headset that gives detailed guidance on how to assemble components, overlaying images and instructions over the top of what you see in front of you. When you walk into a physical high-street store, AR mirrors will let you try on clothing and see—in a realistic way—how they'll look on you, without you having to get undressed. (As an aside, in virtual online changing rooms, you'll be able to combine different items of clothing to try out multiple outfit combos before you buy, just as you would in a physical store. Hugo Boss is already working on this.) In salons and beauty stores, you'll be able to virtually try on different shades of lipstick or hair colours or hair styles before you take the plunge.

So, when Mark Zuckerberg said the metaverse will be like being *inside* the internet, he was absolutely right. But it will also be like bringing the internet and virtual elements out into the real world, if that makes sense.

What will all this mean for us as humans? Will we end up living more of our lives in virtual worlds and environments? Probably. But that doesn't mean virtual experiences will be any less meaningful than real-world experiences. (According to a 2020 Ericsson survey, 70 percent of respondents believe we will be able to create VR worlds that our brains can't distinguish from real worlds by 2030.)[1] Many relationships start online these days. Most of us are used to working or learning online to some degree or other. Clearly, humans are not averse to experiencing life events online. As the metaverse comes to fruition and this new vision of a "future internet" evolves, our online and virtual experiences will become more immersive, more engaging, more realistic, and—ultimately—more enriching. (There are potential downsides to this, of course, such as trolling or online bullying feeling more realistic, or someone experiencing harm in a VR environment.) I do believe we'll be able to find meaning and connection in virtual worlds, just as we do in the real world. Meanwhile, thanks to technologies like AR, we'll be able to move through the physical world around us in an easier, more engaging way.

The Technology That Makes All This Possible

I've touched on augmented reality, but let's spend a little more time exploring the technology that will make the metaverse possible.

Extended reality technologies

There are a few different technologies that sit under the extended reality (XR) umbrella—in fact, I like to think of XR as a spectrum, where the technologies become more immersive the further along the spectrum you go.

Virtual reality

The XR technology you've probably heard the most about is virtual reality. It's also the most immersive of the XR technologies. Strap on a VR headset and you're completely transported into a 3D, 360-degree, computer-simulated world, whether it's walking on the Moon, visiting Ancient Greece, or whatever. Meanwhile, the real world around you is totally blocked out.

The gaming industry was an early adopter of VR technology, and is perhaps still the first thing people think of when it comes to VR experiences. But nowadays, many other industries are beginning to harness the possibilities of creating fully immersive experiences for customers and colleagues, for example, through virtual meetings, VR training sessions, or VR experiences that tell a story about a brand, product, or ingredient.

Meta (Facebook) has invested heavily in VR since acquiring headset manufacturer Oculus in 2014, and has made no secret of the fact that it sees VR exploding way beyond gaming. One of Meta's goals is to use virtual environments, combined with the power of social media, to create shared online spaces where people hang out and chat (or, really, do anything they like—because pretty much anything is possible when you can create your own virtual world).

But to enjoy such a VR experience, you need some specialist kit—at the very least, a VR headset. (At the super-affordable end of the scale, you can get a basic Google Cardboard VR viewer that, along with an accompanying app, transforms your smartphone into a VR device, although this will result in a less slick experience.) VR headsets generally include stereo sound or come with earbuds to provide sound effects. Plus, there's head- and eye-tracking technology to track your movements (typically, using laser points and infrared LED lights within the headset itself). The good news is that VR headsets are getting lighter and easier to wear. For example, you no longer need a heavy headset with lots of cables that connect to a computer; instead, you can have a lightweight, standalone headset or head-mounted display that doesn't need to be plugged into

a main computer. What's more, new VR tech is being developed all the time—think haptic suits that allow you to experience physical sensations that accompany the VR experience; smaller, less obtrusive VR goggles; and treadmills or boots that give you the feeling of really walking around. Bottom line, VR technology will become more accessible and affordable, and VR experiences will become slicker and more immersive. And all this means VR will play a mainstream role in the future of the metaverse.

Augmented reality

At the other end of the XR spectrum we have augmented reality, which I've already touched on briefly. For me, AR has the biggest potential in the short term, because it doesn't have to involve special kit like goggles or headsets. In many cases, all you need is a simple smartphone, laptop, or tablet. (Saying that, there are specially designed AR glasses, like Google Glass, which will become more commonplace in future.)

In a nutshell, AR involves the projection of digital elements—such as information, graphics, animation, or images—onto the real world, so that the digital content being superimposed looks like it is part of the physical world. I've already mentioned Pokémon Go as one example of this technology in action; those Snapchat filters that overlay cute animal ears over your own are another basic example.

Because the digital element is superimposed onto reality, you're still very much in touch with the real world in front of you (unlike, say, a VR experience, where the world created around you is entirely digital). Yet, thanks to the AR projection, the real world has become enhanced—more informative, more entertaining, or more interactive, for instance.

Hybrid reality

Somewhere in the middle of the XR spectrum, we have what's called mixed reality or hybrid reality. Even experts argue over the definition of hybrid reality, so I won't dwell on it too much, but suffice to say it typically involves combining elements of VR and AR to enhance the real world around us

without blocking it out. So, it's not quite as immersive as a full-on VR experience, where you enter a simulated world and leave the real world behind. But it's a bit more involved than your basic AR experience or app.

XR will blur the lines between the real and not real

What I want you to take away from this section is that all of these XR technologies will increasingly blur the boundaries between the real world and the digital world. And this will be key to the growth and success of the metaverse. As the boundaries become more blurred, we'll find ourselves switching from a real-world experience (or an augmented real-world experience) to something more immersive and back again, without friction. Say, for example, you're taking a (real-world) holiday on a Greek island. Using AR, you could point your phone at some impressive marble columns and the information onscreen will tell you those columns once formed the entrance to a site where mysterious ancient rituals were performed. Flip on some VR goggles and you could then immediately step into this world and move among the people of Ancient Greece! And because the metaverse is all about shared virtual worlds, you hop on a chat and tell your mum to get her VR goggles and meet you in Ancient Greece World (or whatever it's called), so she can share a little taste of your holiday.

Avatars

Another tech feature that will play a big role in the metaverse—or, at least, parts of the metaverse—is the avatar. No, not James Cameron's epic saga, but a digital representation of you that will live in the metaverse and interact with others.

Thinking about it, you could potentially have different avatars for different settings, if you were so inclined. For example, you could have a smartly dressed, recognizable avatar for your virtual work meetings. You could have a completely different avatar (human, elf, kitten, whatever) for gaming and hanging out with friends online. And you could also have a very

realistic avatar that accurately reflects your real-world size and shape, which you could use to virtually try on clothes.

Whatever form they take, and however realistic they become, everyone seems to agree that avatars will be a core part of the metaverse experience. They will also play a key role in the interoperability that I mentioned earlier—meaning you'll be able to take your avatar with you from experience to experience. So, you'll be recognizable as "you" wherever you are in the metaverse.

Head to my TikTok channel and you'll see my digital avatar, or Bernard Marr 2.0 as I call him. He looks and sounds almost exactly like me, but he is in fact my digital twin—an avatar powered by artificial intelligence (AI) and machine learning. He was created by a company called Synthesia, using images and recordings of me stitched together with machine learning. Watch my TikTok videos and you'll see Bernard Marr 2.0 presenting them. I could present these videos myself, but having a digital avatar is a really fun way for me to explain and demonstrate technical topics like avatars, the metaverse, digital twins, machine learning, and more. And as the technology evolves, he may even take on more and more of my workload—giving lectures, for example. Your own digital avatar may, one day, do tasks on your behalf.

Personally, I find the possibilities of hyper-realistic digital avatars very exciting, especially when it comes to making the internet more immersive, realistic, and engaging. The technology could, for instance, be used to resurrect beloved past entertainers so new generations could enjoy their performances as a virtual experience. The team from tech startup Metaphysic—those AI whizzes famous for creating amazingly realistic videos of fake Tom Cruise—even competed on America's Got Talent, bringing Elvis back to life on stage and making a synthetic (but super-realistic) Simon Cowell sing. Imagine a future in which you could do karaoke with Elvis or relive Jimmy Hendrix at Woodstock in a way that feels totally absorbing and realistic!

If you fancy creating your own digital avatar, there are plenty of tools you can try right now. For example, there's Ready Player Me, which creates full-body, 3D avatars that can be exported into various different environments. Or you could use something like Bitmoji to create a cartoon avatar.

Digital twins

My avatar, Bernard Marr 2.0, is essentially a digital twin—a digital copy that recreates the real me. But the concept of digital twins goes way beyond my TikTok channel and is, in fact, one of the biggest tech trends around.

A digital twin is a digital model of something in the real world. It's already possible to create a digital twin of pretty much anything in the real world—a building, a car, a component, a whole factory line, a city, a process, a system . . . anything.

Currently, digital twins are mostly used to tweak and adjust variables to study what happens, before making expensive changes to the real-world object or system. A good example comes from the Los Angeles Department of Transportation, which created a digital twin of the city's transport infrastructure to model the movement of micro-mobility solutions like e-scooters and shared-use bicycles. The Shanghai Urban Operations and Management Center has done something even more ambitious, building a digital twin of the entire city, which is used to model 100,000 elements, from refuse disposal and collection to road traffic. It also helped authorities plan and react during the COVID-19 pandemic. Elsewhere, Tesla creates a digital twin of each one of its cars, using sensor data from the real-world vehicle and AI algorithms to predict where faults and breakdowns are most likely to occur. This reduces Tesla's costs in repairing and servicing cars that are under warranty and improves the Tesla customer experience.

Digital twins are therefore an extremely useful (and low-risk) way of experimenting with factors and predicting what is likely to happen with the digital twin's real-world counterpart.

As the metaverse evolves, I believe we'll see digital replicas popping up all over our shared virtual spaces. And the more digital twins we have of real-world stuff (buildings, cities, products, etc.), the more components the metaverse will have. We could meet with colleagues in a perfect digital replica of our office building, or have our avatar test drive a digital twin of a new car. In short, digital twins will make the metaverse feel more real.

Recognizing the current limitations of technology

We can already do exciting things with XR, avatars, and digital twins, but it's really important to recognize that all this technology has come a long way in the last few years—and will continue to evolve rapidly. What I mean by this is, don't judge the future potential of the metaverse—how immersive it will be, how engaging it will be, and so on—based on what we can see and do with today's technology. This is just the start of all things metaverse. Existing technologies will advance and new technologies will emerge to bring this vision of a future internet to life.

Think back to the very first websites. They were Basic with a capital B. If I'd judged the entire potential of the internet on those early examples, I'd have been embarrassingly wrong. The metaverse is at the same stage as those very first websites, so we must all cut it some slack and maintain an open mind about the amazing things to come.

Who's Working on the Metaverse Already?

If we're truly going to have this shared, connected metaverse, it's going to take a lot of work from some of the world's biggest organizations. Already, many companies are positioning themselves as big metaverse players and developing platforms that will (ultimately) form part of the metaverse.

Meta is the obvious one. Changing the name from Facebook to Meta was a clear sign of how important Mark Zuckerberg feels the metaverse will