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The Risk of Exclusion in the Metaverse

The Metaverse promises to change the face of interactions and collaboration in the future. However, as it has begun, we are starting to better understand the risks a Metaverse future will bring to Employers, Application Developers, Designers, and Device Manufacturers. In this paper, Annie Hardy, Cisco's Senior Visioneer, explores Extended Reality trends and technologies, and then talk about how this Metaverse the world is creating presents a real risk of developing exclusionary spaces that foster bias.

In January, I gathered a group of colleagues together in what I called "The Metaverse Collective" – a group of smart, passionate colleagues dedicated to thinking broadly and deeply on how the emergence of the experiential, spatial web will affect Cisco and our customers. We spend a lot of time talking about the future of interaction design and how consumer device adoption is going to drive the future of B2B digital experiences, and this narrative has really accelerated over the past 3 years.

In this post-covid world, our days are filled with tools and APIs in an evolved state of hybrid collaboration. During this pandemic, those interactions have remained largely on our laptops, desktops, or teleconferencing devices, mostly connected via business or home wireless service provider infrastructure.

However, whereas the majority of our current interactions live on two-dimensional screens, advancements in AI, materials, hardware, computing, and blockchain are driving an appetite for more immersive, dimensional experiences beyond the narrow use cases we saw before the pandemic. Connecting virtual and augmented realities into a universe of extended reality experiences is the foundation of the Metaverse.

That said, the Metaverse is but one part of a bigger, broader movement towards Web 3.0, or the Spatial Web, as coined by Gabriel Rene. The Spatial Web encompasses extended reality experiences within the Metaverse, but also a web of IoT landscapes, closed virtual ecosystems, and other forms of digital overlays on the physical world.

Change is coming, and we're seeing a lot about the technology and organizational impacts of those changes.

But what we're not hearing so much about is how the very human impact of these innovations is resulting in a creation of and investment in solutions and spaces that lack racial, gender, and cultural diversity.

In this article, I want to explore Extended Reality trends and technologies, and then talk about how this Metaverse the world is creating presents a real risk of developing exclusionary spaces that foster bias.

In fact, it's already happening.
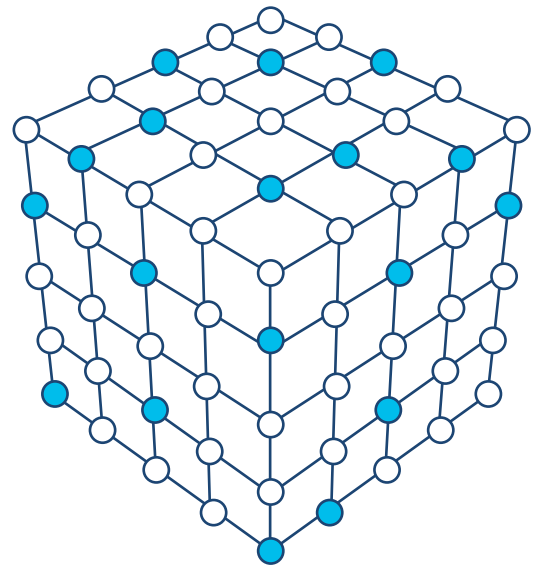
Before I dig in, I'd like to start by defining a few terms I'll use in this article:

Extended Reality (XR) – use of immersive spatial technologies that create a digital experience – either through virtual reality spaces, augmented reality interfaces, or mixed reality experiences.

Virtual Reality (VR) – Immersive digital spaces experienced through a virtual reality headset like Oculus.

Augmented Reality (AR) – A digital filter on the world that overlays visual information and cues through a transparent panel, haptics, projection technology, or other sensory experiences, including Microsoft Hololens.

The Metaverse – a network of virtual and augmented environments a user can access through a digital ID, which will include distinct but connected virtual worlds like Facebook and Decentraland.

The Spatial Web (sometimes referred to as Web 3.0) – a proposed evolution of the Internet we experience today (also referred to as Web 2.0), which weaves together the physical world with digital information.
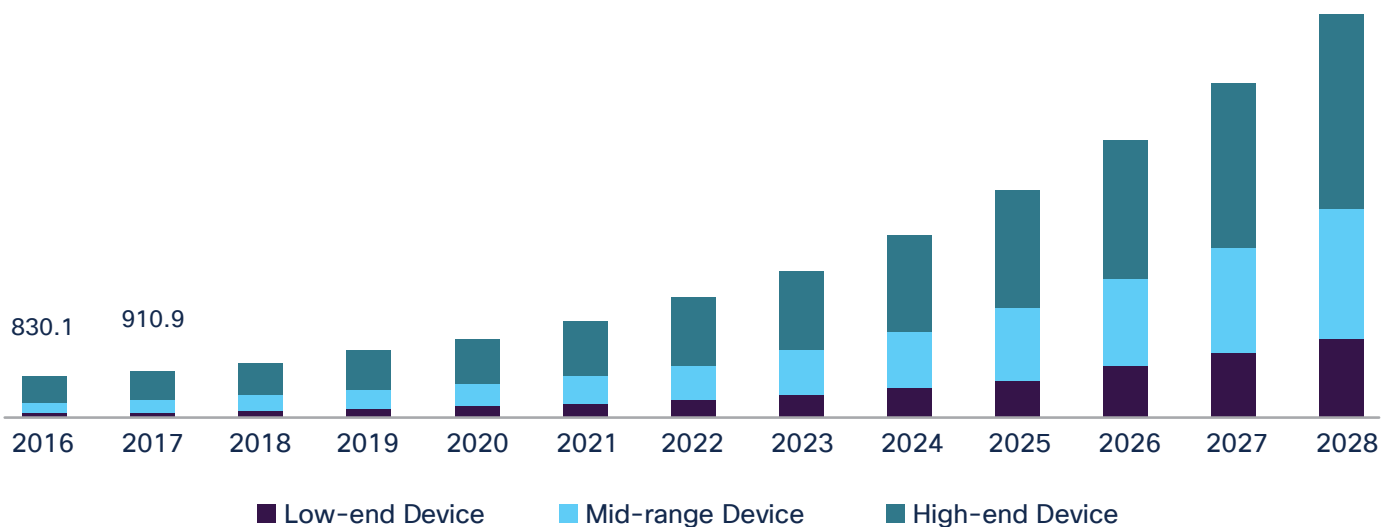
Digital Twins – Although the term "Digital Twin" can represent a digital copy of a digital asset, a Digital Twin in the Spatial Web often refers to a digital representation of a physical item, like a digital version of the office chair you own in real life.

Extended Reality Adoption and Growth

Extended Reality's first – and still most popular – use case is gaming. Games are a huge driver for VR headset adoption, and game developers are seeing big returns on their investments. VR game revenue increased by around 30% from 2019 to 2020 alone.

According to Meta (formerly Facebook), over 60 Oculus titles were netting $1MM as of February 2021, a huge jump from 35 titles as of September 2020.

U.S. VR headset market size, by end-device, 2016 – 2028 (USD Million)

Legend: ■ Low-end Device   ■ Mid-range Device   ■ High-end Device

Data labels shown: 830.1 (2016), 910.9 (2017)

Source: https://www.grandviewresearch.com/industry-analysis/virtual-reality-vr-headset-market

Although initially pricey, VR headset prices are dropping (an Oculus Quest 2 today will cost you $299), sales are surging, and predictions for the space show incredible projected growth.

> *"When my hairstylist brings up [VR game] 'Beat Saber' … I feel like we've finally broken through this important barrier and have gone to a point where it's an accepted mass market technology, like any other consumer electronics devices."*
>
> – Mike Verdu, VP of Content for Facebook Reality Labs, to The Washington Post

On the AR side, don't forget the Pokémon Go Craze of 2016. Pokémon Go was an incredibly successful experience that brought Augmented Reality to a Mass Audience and, at its peak, drew over 250 million people per month.

I admit that I was a huge Pokémon Go fan and used to take detours when driving around town to catch digital critters. Although I was terrible at it, it was fun.

Certainly more fun for me than for the Canadian military, as they dealt with the issue of strangers meandering around some of their military bases, which were showing up as Pokégyms and Pokéstops.

The illusive Pikachu. Marc Bruxelle, via Alamy, New York Times

Consumer XR has been has become far more familiar beyond gaming over the last few years. IKEA was another early adopter of AR when it released its IKEA Places app in 2017, allowing you to select pieces of furniture and superimpose them on your room as a background. In 2021, it launched the IKEA Studio app, which allow you to design an entire room using the LiDAR sensors on your iPhone.

LiDAR stands for Light Detection and Ranging, and represents sensors that use lasers to bounce off of objects and measure the distance by timing the speed that the light pulse returns to the sensor. It's critical to mass adoption of XR experiences and it's on newer Apple Phones and iPads. The Android answer to this is ARCore, a Google invention that serves the same purpose on Android devices.

By 2026, 25% of people will spend at least one hour a day in the metaverse for work, shopping, education, social and/or entertainment.

– Gartner Inc.

The Case for Culture

As we've all seen and experienced, the consumer XR business is real and vibrant and is no longer for early adopters only, and some business use cases for XR have been pretty clear from the beginning, like virtual and augmented surgical training. With the efficiency of scale and investments in the technology, new business use cases are also emerging, the most critical of which is to **use XR as an enabler of hybrid work culture**.

Cisco is one company building the future of these business use cases for XR. In October, Cisco announced Webex Hologram, which will enable meetings in virtual reality, running on Microsoft HoloLens and Magic Leap 1.

Currently in beta, the promise of these kind of virtual interactions is a more personal meeting experience, enabling colleagues to review product designs, provide feedback on manufacturing schematics, connect more deeply with each other, and more.

"Since the beginning of time, people sat around in a circle and had a real conversation, and our current 2D video conferencing equipment where everyone's just a flat surface has taken us a long way away from that. I'm trying to figure out how to get back to that circle experience…If we were an architecture firm and we're doing architectural approval…you want to see the people at the same time, and you want to understand people's reactions and how they're dealing with the data."

– Jeetu Patel, Cisco EVP and General Manager of Security and Collaboration

Hybrid work collaboration is possible in the laptop-driven post-Covid age, but technologies like VR can make it even better.

Beyond productive collaboration, other companies are using virtual spaces as culture drivers. Accenture is shipping Oculus Quest 2 headsets to new employees, inviting them to a virtual space to replicate an in-office experience while preserving the benefits of working from home.

"When you started a new job, but pre-pandemic, you showed up someplace. You had the excitement, you went home, and you said, 'This is what the coffee's like, this is who I met… But … we just ordered thousands of Oculus headsets. Why? Because our onboarding is now going to include virtual reality… We do believe it is a permanent experience that all companies will have more people who work remotely. We've really rethought that experience."

– Julie Sweet, CEO, Accenture

The idea of creating a digital twin of a workspace to bring colleagues together in a virtual community requires a technology infrastructure to support it – including hardware purchasing, hardware support, application development, governance, and a solid infrastructure to support the bandwidth required.

It's not as simple as building a space.
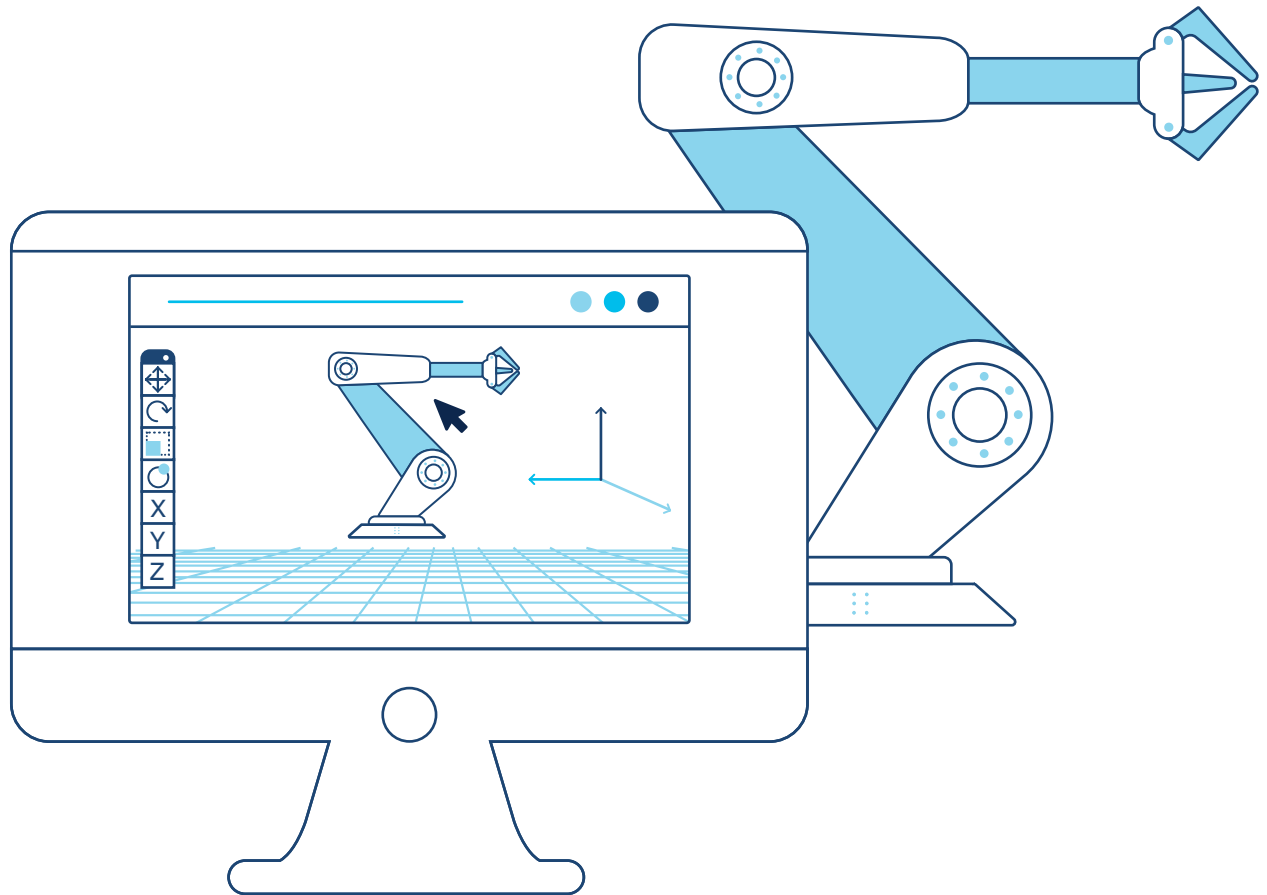
Creating thoughtfully designed immersive experiences requires attention to the needs of the users – the humans – as well as acknowledgement of one's own biases when it comes to "what things should look like." Experience is such a personal thing – it is not a universal truth.

Because of the importance of that concept – the idea of human-centered immersive spaces – requires a skill set that goes beyond ARKit expertise. It requires listening to diverse voices that challenge your own perspective.

The Demographics of Metaverse Builders

The demographics of the people who build the Metaverse will vary, but as we better understand what the Metaverse is, specific skill sets arise as critical:
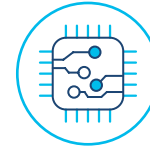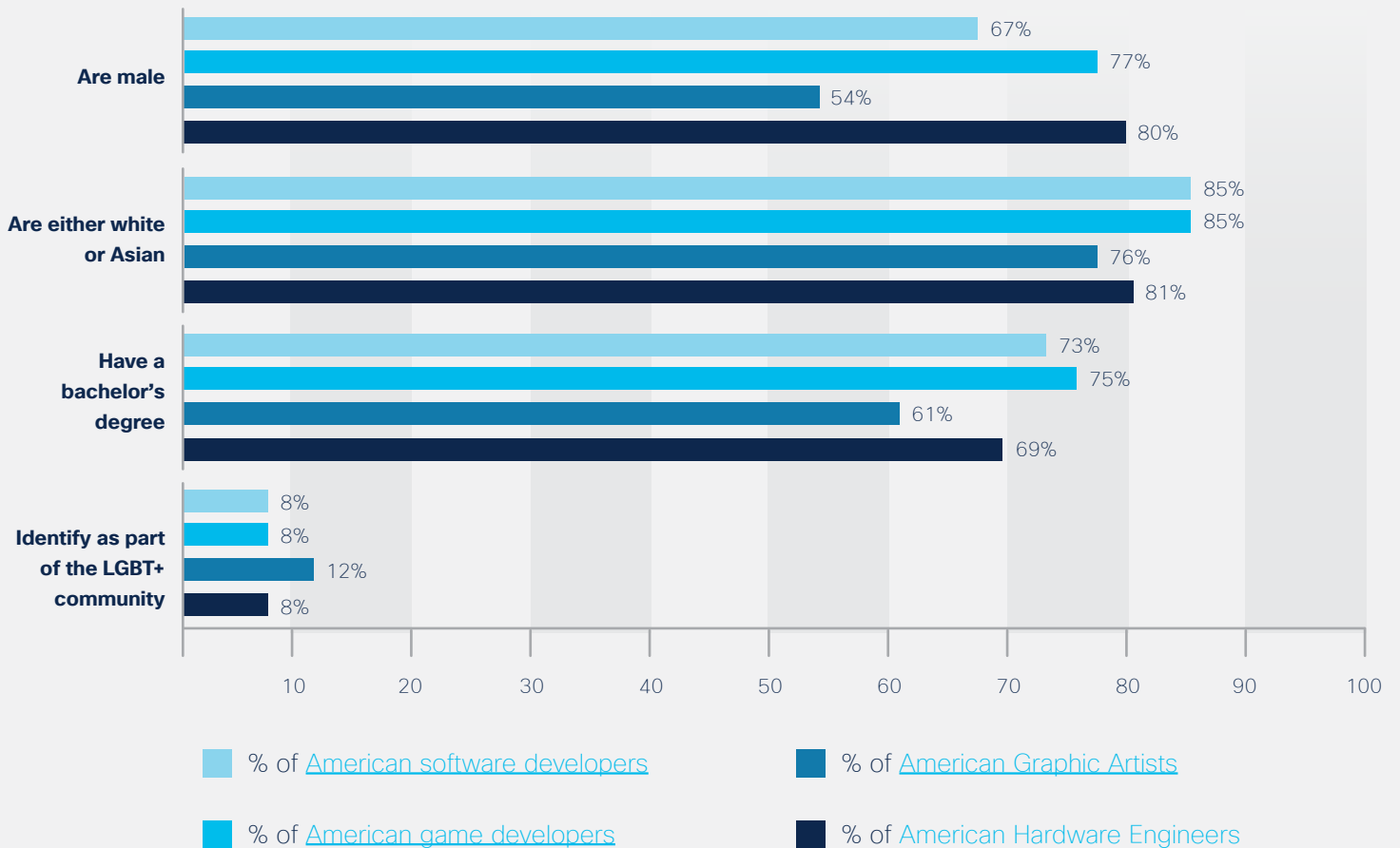
Software
developers

Game
developers

Graphic
artists

Hardware
engineers

Are male
67%
77%
54%
80%

**Are either white
or Asian**
85%
85%
76%
81%

**Have a
bachelor's
degree**
73%
75%
61%
69%

**Identify as part
of the LGBT+
community**
8%
8%
12%
8%

10 20 30 40 50 60 70 80 90 100

% of American software developers

% of American Graphic Artists

% of American game developers

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67%
Are male

85%
Are either white or Asian

73%
Have a
bachelor's degree

8%
Identify as part of
the LGBT+ community

Game developers

77%
Are male

85%
Are either white or Asian

75%
Have a
bachelor's degree

8%
Identify as part of
the LGBT+ community

Graphic artists
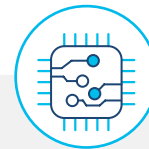
54%
Are male

76%
Are either white or Asian

61%
Have a
bachelor's degree

12%
Identify as part of
the LGBT+ community

Hardware engineers

80%
Are male

81%
Are either white or Asian
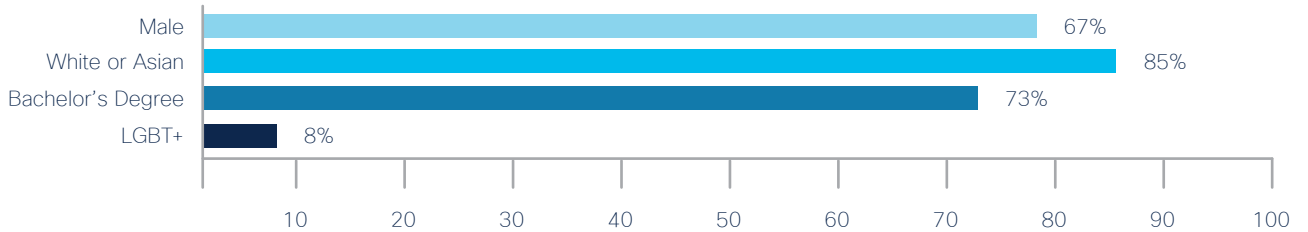
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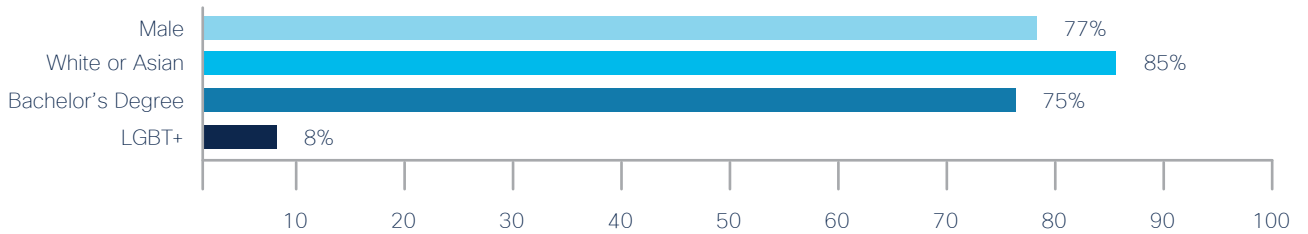Identify as part of
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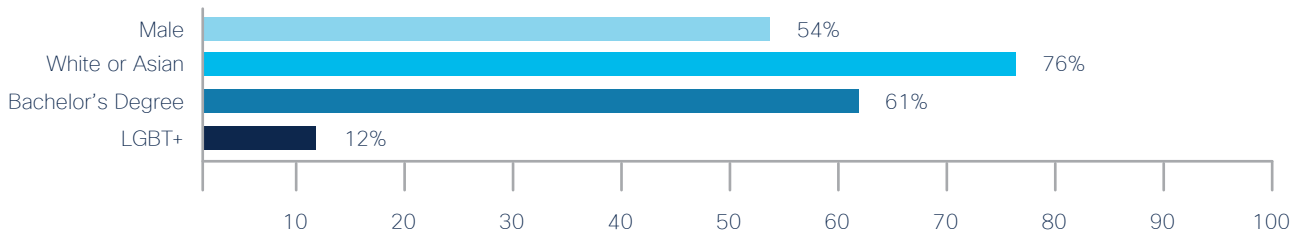
Software developers

Male	67%
White or Asian	85%
Bachelor's Degree	73%
LGBT+	8%

Game developers

Male	77%
White or Asian	85%
Bachelor's Degree	75%
LGBT+	8%

Graphic artists

Male	54%
White or Asian	76%
Bachelor's Degree	61%
LGBT+	12%

Hardware engineers

Male	80%
White or Asian	81%
Bachelor's Degree	69%
LGBT+	8%

Consider the implications of an entire universe of immersive experiences, with the potential to dramatically impact self-perception, as being defined and developed by team with a limited perspective. The impact of gender bias in Web 2.0, for instance, is well documented – and we expect to see it in the development of the Spatial Web, as well.

A futurist colleague of mine was invited to test a new VR headset a few years ago, and as the team gave her directions about using the controllers, she struggled to make the device work as instructed. It ended up that she couldn't reach the buttons on the controllers, because they were designed by men, for the hand size of an average male. **They were too big for her**.

It's yet another data point about how the world seen through the eyes of one person doesn't necessarily reflect the truth of someone else.

We've all been through corporate culture training, and we understand the risk that our internal biases run relative to how we build things and for whom. But in this moment when we are just now getting better at identifying and counteracting our own biases in how we speak and write, we will be opening up a new dawn of applying those biases and prejudices to an immersive experience that is designed to alter the way people feel.

Are we ready for that?

One way to address this is by making sure we give value and power to different voices in the product and experience development process. In addition to continuing to invest in a STEM pipeline for women and People of Color Metaverse development requires interviews with diverse populations, making sure they are represented in user experience testing.

In addition, it requires weighting of those voices when analyzing feedback, to ensure that incredibly strong feelings of one people group aren't averaged out to be unimportant.

Human-centered design is critical here.

I fear that as we move into creating the Metaverse, if we do not pull diverse voices into development, we are going to find ourselves creating a series of quietly biased echo chambers.

Access and Equity

As previously noted, the cost of XR technologies is high. Some of the technologies have been consumerized fairly well, but they haven't yet become ubiquitous. It is with wide-spread adoption of the technology that we expect to see prices drop as they always do. And in some spaces, strategists will end up designing XR playbooks and driving strategies and curricula leveraging XR tech – which has already started in some areas.

There are movements toward adopting more XR in education, well exhibited by Stanford announcing its first class held entirely in Virtual Reality, called Virtual People.

At this point, it's fitting for me to pause and share that I often use the term "exclusive" when referring to the Metaverse. Because currently, the barrier to entry is high enough to remain out of reach for many. A $300 headset, a $1,200 iPhone, enough bandwidth to support it all – this comes a cost.

When we think about that access, and we think about how ubiquitous those experiences will become in social, professional, and educational interactions, we have to think about who will be left behind.

In speaking with first-generation college students, I found that most of them have Android phones, not iPhones. Why is that?

If you guessed that first-generation college students are probably more likely to come from lower income households – and that Android phones are less expensive and more often free on cell phone plans – you're right.

According to the National Center for Education Statistics, 77% of first-generation college freshmen come from families that make less than $50K per year.

> *"The median family income for first-generation freshmen at two- and four-year institutions was $37,565, compared to $99,635 for continuing-generation freshmen."*
>
> – National Center for Education Statistics (NCES)

I recognize that if you're a first-generation college student who made it to Stanford, they will probably be able to connect you with some gear to engage in XR collaboration. But pause for a moment to consider the technologies that are developing, and what the financial obstacles are to creating inclusive immersive experiences.

One way we can address this is for device manufacturers to build strong relationships with educational institutions and ensure discounts for non-profit purposes. Technology strategists who are looking at Metaverse 1.0 as emergent should look initially at crafting a more device-neutral strategy, letting people experience VR and AR if they want, but developing an omni-channel approach so that late adopters of XR tech aren't left behind.

Addressing Biases and stereotypes

I played with Unreal Engine's Metahuman Creator a few months ago and had a grand old time building a few interesting Metahuman avatars. It is incredible, creative and a little scary. Unreal Engine has provided users a tremendous amount of control on avatar features ranging from skin tone and texture to body shape and size. However, within these seemingly endless options, there are limitations that hinder how well these applications suit the needs of their users.

I'd like to introduce you to Vivian, my Avatar, courtesy of MetaHuman Creator.

She's a mom of 4 kids and spends too much time running them around to their different games and activities. She's a voracious reader and is quietly writing her first book. She has a hearty laugh her friends love, a soft spot for shelter puppies (she has 3 adopted dogs), and a penchant for Doc Martens.

Vivian also suffers from Neuropathy, which in her case requires the use of leg braces. She is also prefers to wear skirts that flatter her figure, but the applications her company uses for avatars have a limited choices for attire. She doesn't want to pretend to have a different body shape than she does – she's proud of her figure and feels like she'd be dishonest by portraying herself differently than she is. She just wants to represent herself authentically so that her colleagues don't feel like she's catfishing them when they see her. She wants to feel good about how she is represented, finding ways to flatter her figure and represent her personality, but she feels restricted by the limited options provided by the avatars available to her.

How can she bring her whole self to work In the Metaverse if the options for her to represent herself aren't features offered by avatar creators?

An outcry about limitations on physical features happened around Bitmojis as well, as you can see in a Change.org petition urging Bitstrips Inc. and Snap Inc. to create at least three more plus sized body types for Bitmojis.

In my own circle of female friends, we've debated how we will present ourselves in the Metaverse. On one hand, I'm excited to explore how I can creatively express who I am and accessorize with a unique style, donning fashion NFTs.

On the other hand, all the women I've talked with have expressed interest in using a male avatar to experience spaces. This may be because nearly half of us experience gender discrimination almost every day, and 63% believe there will always be gender discrimination in the US.

Perhaps we want to liberate ourselves from that and see these immersive environments as an opportunity.

Or perhaps we fear discrimination and are struggling to balance the desire to protect ourselves with the desire to be real and honest about who we are.

For people of color, it adds another context. As Breigha Adeyemo shares in her article on the Metaverse and racism, we are already seeing avatars being priced differently based on perceived race, and Meta is already struggling to address sexism and racism in virtual spaces.

> *"If the metaverse is meant to be an embodied version of the internet, as Zuckerberg has described it, then does that mean that already marginalized people will experience new forms of harm?"*
>
> – Breigha Adeyemo, in her article
> I'm a Black woman and the metaverse scares me – here's how to make the next iteration of the internet inclusive

As I was exploring the kind of avatar I would purchase as an interface for a virtual assistant (think of it like adding a face to Alexa), I was faced with myriad examples, and I wasn't sure what criteria I should follow.

If I choose a woman, am I somehow reinforcing gender stereotypes? If I choose a person of color, am I reinforcing racist stereotypes?

These aren't easy issues to navigate, and we should be ultra-cautious – but effectively, there isn't a playbook for inclusivity in the Metaverse. And I believe there should be.

To address these risks, we need for designers and developers to talk to the people they'll be representing, to ensure that they're reflecting the characteristics that are important to their audience.

Employers seeking to create virtual or augmented spaces or assistants should also listen to the thoughts and perspectives of others and conduct meaningful social psychology work to ensure that they're not reinforcing racism, sexism, genderist, ableist, or ageist stereotypes with the choices they're making. People leaders need to unite to define how they govern interactions in the metaverse – tracking and tracing employee engagement to protect people from discrimination in these spaces.

Perhaps we can use extended reality as a teaching tool to challenge people to change avatars for a day, step into a public space, and see how they might feel or be responded to differently.
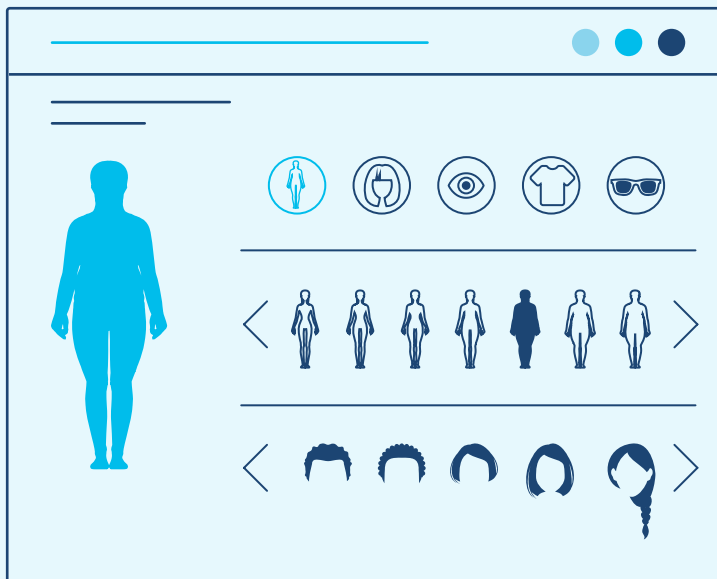
People seek more choices in how they portray themselves, and once we are all in an immersive, experiential environment where we are representing ourselves in virtual workplaces, that realistic, accurate portrayal will be important.

And it will be important for employers to gauge the inclusivity of available avatar features for employees within the context of any XR experience created. How do your employees portray themselves? Can that be replicated honorably in this new environment?

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Governance is Critical, but Challenging

Now, before we have prolific adoption of Extended Reality experience, is the time to start thinking about these things and thoughtfully designing experiences, developing rails around both what we're creating and how we're creating it.

Just as we seek to build standards around how people interact with their workplace, and weave in healthy workplace practices into how the space functions, so do we need to carefully craft extended realities. Whether in education or healthcare, offices or entertainment – the risk to exclusion in the Metaverse is real. The risk to causing harm is real. And if we do not pause to deeply consider the implications of the creative and technological factors of an investment in extended realities, we will fail in cultivating a safe space for humans to thrive in the Metaverse.

People understand the risks inherent within ungoverned spaces, and there are movements to address inequity and injustices. For instance, in VRChat there is already a virtual, citizen-led police force, which considers itself the peacekeepers of the VRChat community.

Although I believe many will agree that the key to a healthy Metaverse is Governance, but in absence of set standards, we must do the best we can:

Employers can select vendors for your extended reality experiences that represent your core values and establish standards to support employee well-being in virtual spaces.

Application Developers can develop human-centered products by testing your experiences with diverse audiences, building diverse development team, and building omni-channel experiences.

Designers can explore how people want to be seen and experienced to ensure that the experience you create fosters inclusion, rather than division.
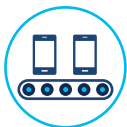
Device manufacturers can partner with social and educational organizations and offer minimal-feature lower-cost devices to democratize XR technology so that people across the socio-economic spectrum can access the emerging experiences that will become staples of our P2P interactions.

I'm eager to build my own avatar, snag a sweet Chanel purse NFT, and join the 25% of people who will be spending at least one hour a day in the Metaverse by 2026. In parallel, I hope that application developers, companies, and users can all thoughtfully build the inclusive Metaverse we want to see, protecting the vulnerable, empowering the underrepresented, and delivering the promise of hybrid connection in a hybrid world.