total immersion

HOW IMMERSIVE EXPERIENCES AND THE METAVERSE BENEFIT CUSTOMER EXPERIENCE AND OPERATIONS

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Capgemini
RESEARCH INSTITUTE

Introduction

Organizations are putting the improvement of their customer experiences at the top of their agendas. Mixed reality (MR), including augmented reality (AR) and virtual reality (VR), has allowed companies to provide a point of difference in their customer experience: a more immersive, sensorially engaging way of interacting with their products and services, before and after purchase. Such experiences foster an emotional connection to the brand and, by extension, strengthen customer loyalty and retention. Consumer AR, in particular, has gained a lot of traction in the past few years, with the popularity of AR games such as Pokémon Go or Snapchat's AR filters (63% – over 200 million – of Snapchat's active users engage with its AR features).[1]
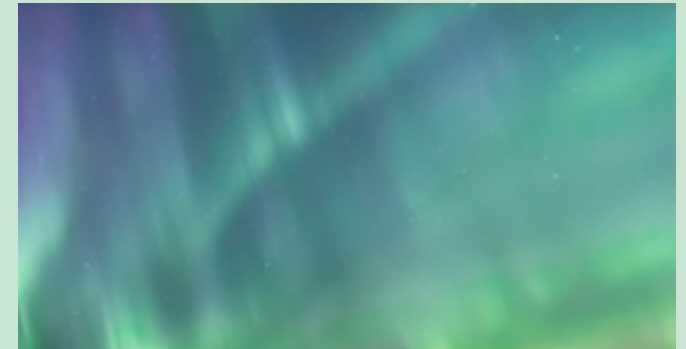
Beyond customer experience, organizations have come to rely on these technologies to improve their industrial operations and even employee experience. Training, remote operations, and maintenance are just some of the applications where these technologies have proven beneficial. When combined with other burgeoning innovations such as digital twins, the benefits of immersive technologies can be amplified greatly. The extended reality (XR) market is poised to reach nearly $400 bn by 2026, with a CAGR of 58% in 2021–26.[2]

63%
over 200 million of Snapchat's active users engage with its AR features.

Introduction

While organizations have been experimenting with these technologies and experiences for a few years now, the advent of the metaverse has lent impetus to the MR discourse. Across sectors, organizations are eagerly talking about what the metaverse could mean for their marketing, their operations, and their employees. Studies have projected the size of the metaverse market to be anywhere between $500 million and $1 trillion by 2030.[3] It is worth noting, however, that, while some aspects of the metaverse already exist – the industrial metaverse, for example – a complete and true metaverse (i.e., an open network of decentralized 3D spaces, see definition below) will take years to become a reality.

In this context, we wanted to understand what consumers think about how AR/VR and other mobile/web-based immersive applications including the metaverse and how organizations are harnessing these immersive technologies for use in their internal operations. To answer these questions, we surveyed 8,000 consumers and 1,000 organizations across various sectors and geographies. We supplemented this research with in-depth interviews with executives from organizations working in this space; technology partners building these immersive solutions, as well as social listening on certain social media channels (for details, please see the methodology in the appendix).

Introduction

Based on our research, we have divided the report into four parts:

01

How immersive experiences pave the way for an **augmented customer experience**

02

How organizations' **internal operations benefit** from immersive technologies

03

An examination of **low consumer adoption** the of metaverse to date, contrasted with burgeoning interest in the platform

04

How organizations can harness immersive technology for **customers** and **operations**

Introduction

Defining the term "immersive experience"

An immersive experience consists of one of the following use cases:

Flat user interfaces (2D)

An enhanced experience accessed through a flat interface such as a smartphone/personal computer (PC)/app via 3D, AR, or VR applications such as an augmented camera for scanning QR codes, a virtual walkthrough of houses, cars, and locations (Google Maps' Live view) or virtual try-on of cosmetics, glasses, and clothes or furniture placement (Amazon AR, IKEA AR).

Natural and spatial interfaces

An enhanced experience realized through voice assistants (e.g., Siri, Alexa); gestures or sensors (Microsoft Kinect, Nintendo's Wii) or through smell/touch (e.g., by using Nest thermostats).
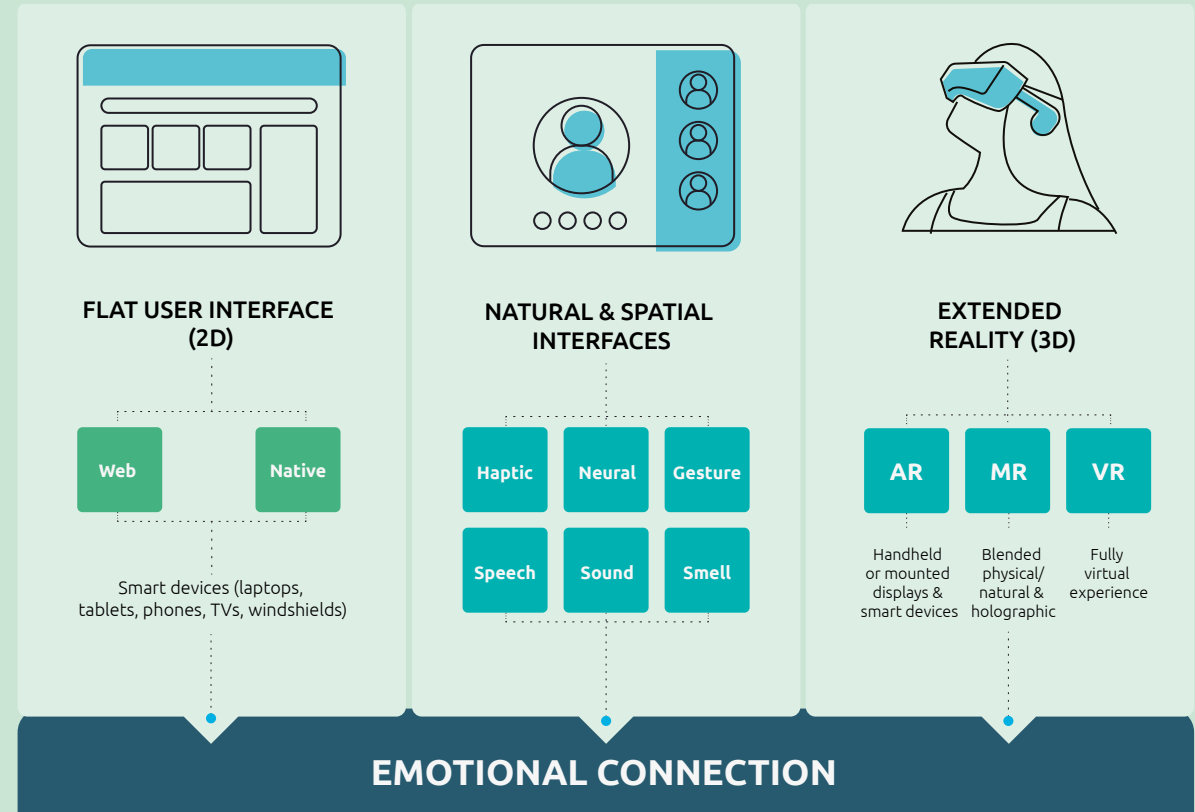
Extended Reality (3D)

Enhanced experience accessed through headsets which either enhance reality or simulate virtual environments. These headsets could enable augmented reality (Google Glass, 'heads-up' display mounts on cars, etc.) or virtual reality (Oculus, SteamVR, etc.) or a combination of both.

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Fig.1

Defining an immersive experience

FLAT USER INTERFACE (2D)

Web   Native

Smart devices (laptops, tablets, phones, TVs, windshields)

NATURAL & SPATIAL INTERFACES

Haptic   Neural   Gesture

Speech   Sound   Smell

EXTENDED REALITY (3D)

AR   MR   VR

Handheld or mounted displays & smart devices

Blended physical/ natural & holographic

Fully virtual experience

EMOTIONAL CONNECTION

Source: Capgemini.

Introduction

Defining the term 'metaverse'

The metaverse is one such environment that offers an immersive experience that can be realized through one or more of the above interfaces. The metaverse can be defined as a "network of virtual worlds," where people can play, shop, socialize, or work via their avatars. Using an open network of decentralized 3D virtual and hybrid spaces, the metaverse exists in parallel to the physical world and is designed to combine online digital and real-life experiences, independent of place, time, or device. The metaverse enables more and stronger emotional connections with consumers, boosts creativity (giving ownership of intellectual property to individuals and communities, reinvents the employee experience and supports collaboration, and drives transparency and efficiency of supply-chain, manufacturing, and engineering processes.

It doesn't require these spaces to be accessed via VR or AR wearables; rather, PCs, smartphones, and web browsers can be used as entry points.

The metaverse can be experienced right now via Web 2.0 (the current internet) through games such as Roblox or Fortnite, and platforms such as Meta's Horizon Worlds, Spatial, Decentraland, The Sandbox, and other real-time 3D-featured environments.

Web 3.0 will transition this experience layer to the mainstream, with improvements that mimic real-life sensations and co-presence. The virtual worlds will be interoperable, and infrastructure and governance models decentralized.

Source: Capgemini.

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Artificial reality (AR) and virtual reality (VR) technologies have been in use for more than a decade. The increased pace of digitalization and the advancements in headset design have made these technologies more accessible. An increasing number of organizations are using immersive tech on web and mobile to allow consumers to try cosmetics, furniture, or clothes virtually. At the same time, organizations find these technologies useful for internal operations such as remote support and training.

Consumers believe immersive technologies will be valuable to them during their buying cycle

Our research indicates that consumers are interested in immersive experiences, made available through mobiles, web browsers, voice assistants, sensors, and extended reality (ER) headsets. Half of the consumers we surveyed felt that immersive experiences could be both impactful and valuable in their buying journeys. This sentiment is particularly true for retail shopping and high-engagement products. Consumers also find these immersive experiences impactful in a training and education context. While organizations do realize the potential benefits of immersive experiences for consumers, scaling remains a challenge. We also found that three in five consumers that own AR/VR headsets, are willing to use these for applications beyond gaming, such as browsing products or experiencing services, for instance via a virtual showroom, prior to purchasing.

Furthermore, our research also shows that nine out of ten consumers are curious about the metaverse, with more than half saying that they would adopt the metaverse when it becomes (more) accessible to them. Interest in the metaverse lies predominantly in its potential as a platform on which to interact with family, friends, and, in a work context, colleagues. There is also significant interest in 'gamification' (employing gaming mechanics in non-gaming environments to promote engagement and interest), metaverse commerce,

Executive Summary

and virtual try-ons. Various sectors have the opportunity to build a new form of customer experience that's both more immersive and more personal. Both retail and manufacturing organizations (particularly of high-engagement products such as cars, furniture, and household electronics) have seen the highest degree of consumer interest.

Organizations realize the immense opportunity, however, find scaling a challenge

From our industry survey of executives working in various sectors, we found that organizations also realize the

opportunity that immersive experiences and metaverse present, for their internal operations. The benefits gained from these use cases range from improved performance to more effective collaboration. Organizations have been investing in a number of pilots – from virtual try-ons to product demos, remote operations to employee training. The scaling of these applications, however, remains a challenge. When it comes to the metaverse, organizations are taking a

58%

of the consumers surveyed mentioned immersive experiences could be impactful and valuable during product/service selection and purchase

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cautious approach. While they recognize the metaverse, as potentially, an important channel for them - with marketing and advertising being the most-cited use case, followed by recruitment and onboarding - nearly three in five are taking a watch-and-wait approach.

What are the prerequisites for successful deployment of immersive technologies?

Our research found that immersive initiatives are largely decentralized; while this is workable, and possibly even preferable, at pilot and proof-of-concept (POC) stages, a center of excellence within each organization would function as an accelerator for such initiatives once they are ready to scale. Such a body could focus on developing a roadmap, prioritizing the highest-potential use cases, and building the necessary technical competencies. Secondly, use cases that have a clear benefit to either employees or consumers should be prioritized for scaling rather than rushing into the space, as seen in the case of a few NFT drops. So, prioritizing the right use cases is particularly important. Thirdly, our research highlighted consumer concerns around safety and security, particularly in the metaverse. While the metaverse is a promising channel for consumer experience, it also amplifies the issues that social media has engendered, with potentially even more serious consequences. A focus

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on building the digital assets and integrating omni-channel integration for a smooth consumer experience is also an essential step. Further, building a community aspect to the immersive experiences will strengthen customer retention. Finally, organizations could benefit immeasurably from partnering with their peers and even consumers, to co-create their immersive experiences.

01

IMMERSIVE EXPERIENCES HAVE IMMENSE POTENTIAL TO ENHANCE CONSUMER EXPERIENCES

Whether you're looking to explore the Great Pyramid of Giza or take a tour of the International Space Station, the possibilities are endless with immersive technologies – and all from the comfort of your sofa or workstation. AR and VR headsets, along with smartphone applications such as AR filters on Snap or QR code scanners, are gradually gaining traction with consumers. A director of engineering at a global retail firm explains:

"Immersive technologies are going to touch every aspect of our lives. Bandwidth is increasing; content quality is improving. Computing power is getting cheaper and more ubiquitous. Barriers to entry are getting lower, and people everywhere will be able to create and experience these immersive experiences. As we bring these innovative technologies closer to the public, we have an opportunity to create bigger, better experiences."

In this context, we wanted to understand consumers' affinity with these technologies, how they can influence consumer decisions, and which sectors can gain a competitive advantage.

Fig.2

An average consumer has positive feelings about immersive technologies
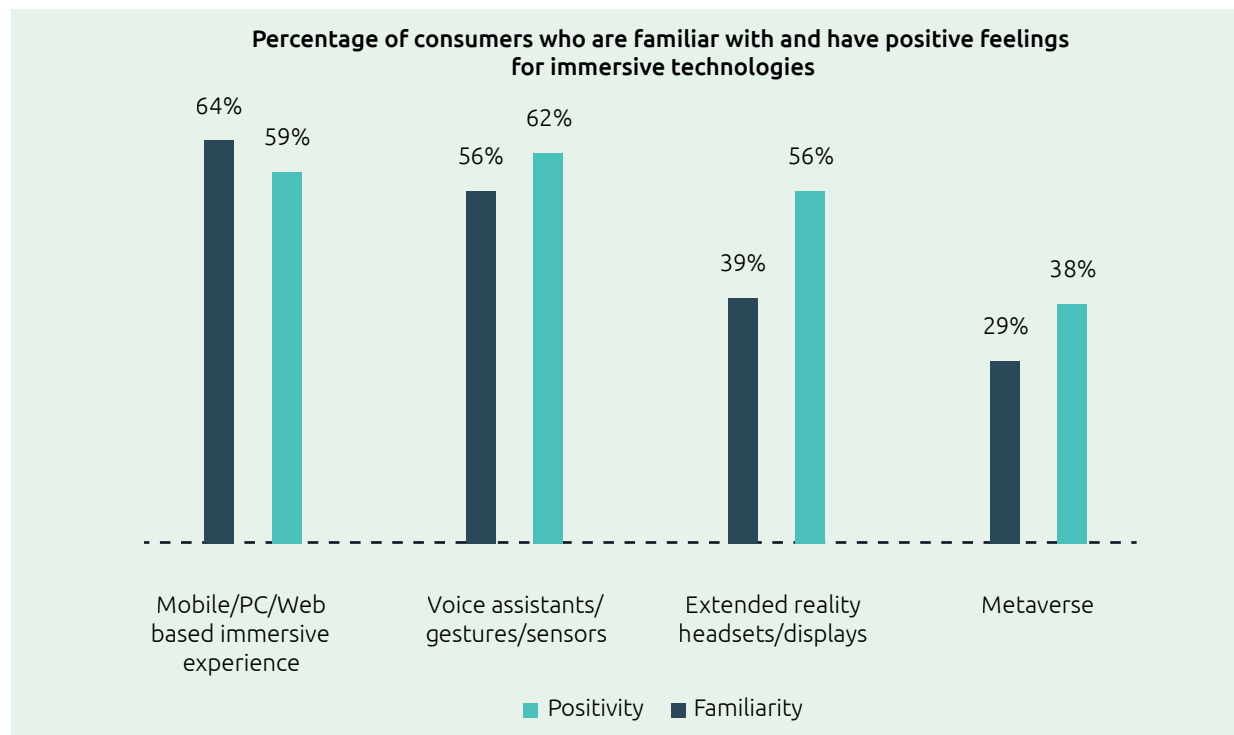
Percentage of consumers who are familiar with and have positive feelings for immersive technologies

Source: Capgemini Research Institute, immersive technology – consumer survey, July–August 2022, n=8,000 consumers.

Consumers have an affinity with immersive technologies

Our survey indicates that many consumers experience a sense of familiarity with immersive technologies. More than six in ten (64%) are familiar with mobile/web/PC-based immersive experiences, while the familiarity with ER headsets/displays is lower, at 39% (see Figure 2).

Although the degree of familiarity varies with the kind of immersive technology, our research has shown that consumers' positive affinity for mobile/web/PC-based immersive experiences, voice assistants, gesture- or sensor-based applications, and ER headsets is not hugely different. More than half of consumers have expressed a positive affinity with these technologies, despite a lower degree of familiarity in some cases. The familiarity and positivity with the metaverse is slightly lower than with the other immersive technologies.

Further, we found that this positive affinity could translate into positive outcomes for brands and organizations: Our consumer analysis suggests that there is a 52-point improvement in net promotor score (NPS) for organizations providing immersive experiences over those that do not.

Tweets highlighting the impact of immersive technologies on consumer experience

"Amazing time at the Green Planet AR experience this morning. Make sure you go and visit if you're in London! So interactive and engaging: the future of science communication."

"I hate buying a thing only to get it back to the house and see that it doesn't fit or doesn't look good. Augmented reality takes most of that guesswork away. "

"One never knows with the arrival of AR/VR how an entirely unthought of dimension can be added to education."
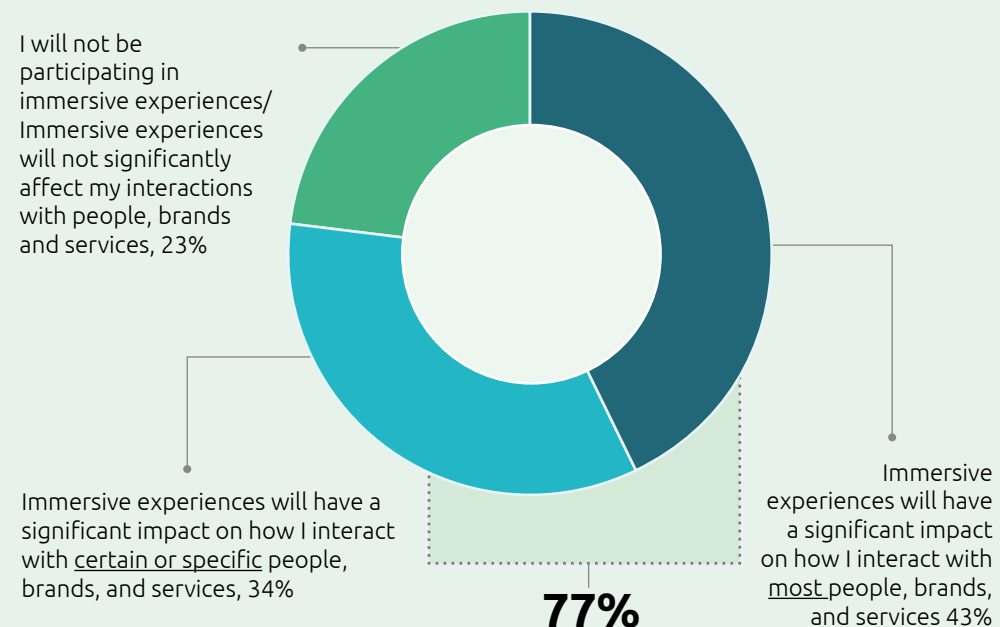
"In Sacramento, went to the #VanGogh The Immersive Experience [exhibition] – and, of course, had to pick up a couple of coffee mugs I'll rarely if ever actually use... Definitely worth the experience. @VanGoghExp – see it if you can. I especially enjoyed the virtual reality part."

Source: Twitter, August 2021–November 2022. Tweets edited for clarity.

Fig.3

More than three in four (77%) consumers believe that immersive experience will significantly change their interactions with people/brands and services

Organizations providing immersive experiences could realize a 52-point improvement in net promotor score (NPS) over those that do not.

Percentage distribution of consumers' opinions of immersive experiences

I will not be participating in immersive experiences/ Immersive experiences will not significantly affect my interactions with people, brands and services, 23%

Immersive experiences will have a significant impact on how I interact with <u>certain or specific</u> people, brands, and services, 34%

Immersive experiences will have a significant impact on how I interact with <u>most</u> people, brands, and services 43%

77%

Source: Capgemini Research Institute, immersive technology – consumer survey, July–August 2022, n=8,000 consumers.

Fig.4

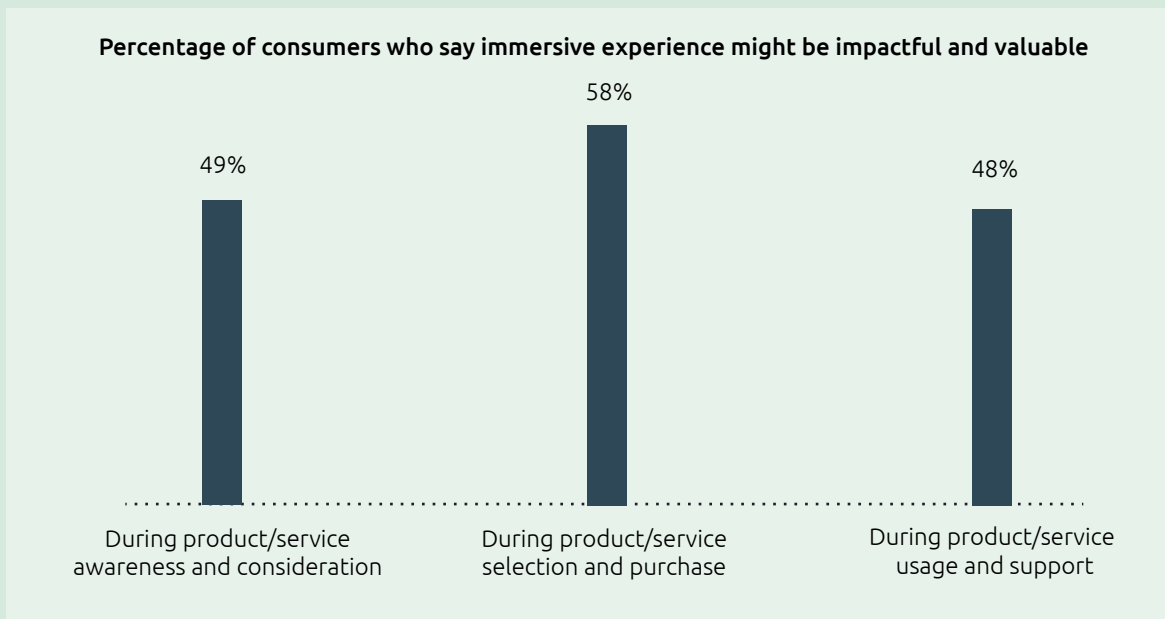Immersive technologies have a high impact on the consumer journey

We also tried to understand where in the consumer journey this impact will be most evident.

Around half of consumers believe immersive technology will be valuable to them

Irrespective of the stage of their consumer journeys, nearly half of consumers believe that immersive experiences will play an impactful and valuable role in their consumer journeys. The majority (58%) expect these experiences to be impactful during product/service selection and purchase. This is followed by product/service awareness and consideration and product/service usage and support, for each of which nearly half of consumers believe they will make an impact (Figure 4).

Percentage of consumers who say immersive experience might be impactful and valuable

	49%	58%	48%
	During product/service awareness and consideration	During product/service selection and purchase	During product/service usage and support

Source: Capgemini Research Institute, immersive technology – consumer survey, July–August 2022, n=8,000 consumers. The above numbers are the average of consumer responses for eight different categories of products and services including banking and insurance, consumer products and household packaged goods, healthcare & medical devices, high engagement products, media and content, retail shopping, telecommunication services, and training & education.

To showcase current adoption, we highlighted specific case studies below:

During product/service awareness and consideration:

Canadian cosmetic brand MAC Cosmetics uses AR to enable the consumer to select cosmetics based on their skin tone, then to try out products virtually, getting a comprehensive understanding of the product in relation to their own preferences. *"Our founding mantra at MAC is: All Ages, All Races, All Genders,"* says Sonia Anand, Executive Director, Global Digital Retail Innovation. *"We needed AI and AR that could seamlessly adapt to different skin tones and face shapes. We require the same sense of inclusivity with our technology that we embrace in our products."* This has enabled MAC cosmetics to gain 200% more engagement and a strong conversion pipeline.[4]

During product/service selection and purchase:

Adidas partnered with Vyking to build a virtual try-on iOS app. By pointing their phone at their feet, the consumer can see instantly how a particular design would look on them, encouraging in-app purchases. The company hopes this will boost conversion rates and speed up consumer decision-making, and also reduce returns.[5]

During product/service usage and support:

Nest Thermostat is a good example of the implementation of immersive technology during product usage. Using a voice assistant such as Alexa, customers can ask Nest Thermostat to adjust the temperature using voice commands and touch.[6] This is an example of spatial or natural interaction.

With immersive offerings including virtual showrooms, virtual product testing, and demos, customers can access products and services from any internet-enabled device, at a time of their choosing. We wanted to try to understand which sectors stand to benefit most from this opportunity.
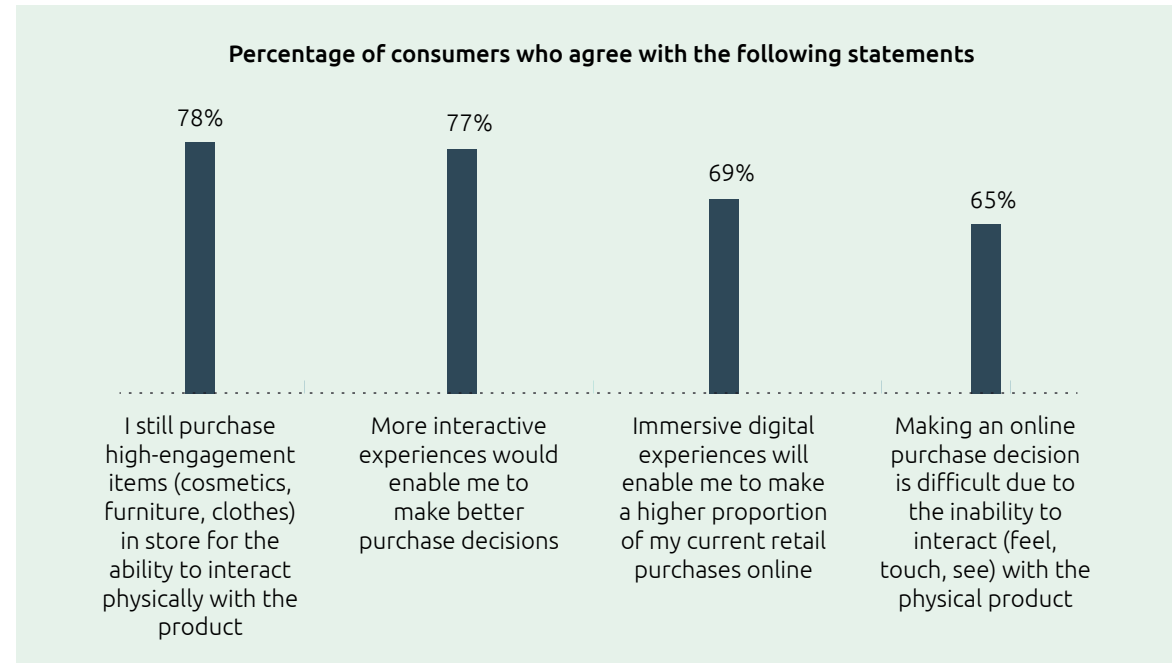
Immersive technologies can avoid the shortcomings of e-commerce

Our research shows that consumers face many pain-points in their online-buying experiences; immersive technologies can help address these issues. This is particularly true for retail and high-engagement products. We define high-engagement items and services as those that require considerable thought and, potentially, trials/demos before a purchase decision is made (e.g., cars, household electronics, furniture, beauty products). Luxury brands tend to fall in the intersection of these two categories, and our research indicates that immersive technologies could be very impactful here. Gucci, Louis Vuitton, and Burberry are some of the brands that have successfully connected with their customer bases via AR.

The current online formats (web, mobile, app etc. without the immersive experience) fail for high-engagement products and services. These categories of products and services, often involve higher expenditure and customization. Nearly two in three consumers state that shopping online is difficult due to the inability to interact physically with a product (see Figure 5). Thus, an immersive shopping experience could be valuable

Fig.5

Immersive technologies can enable high-engagement online product purchases

Percentage of consumers who agree with the following statements

78% — I still purchase high-engagement items (cosmetics, furniture, clothes) in store for the ability to interact physically with the product

77% — More interactive experiences would enable me to make better purchase decisions

69% — Immersive digital experiences will enable me to make a higher proportion of my current retail purchases online

65% — Making an online purchase decision is difficult due to the inability to interact (feel, touch, see) with the physical product

Source: Capgemini Research Institute, immersive technology – consumer survey, July–August 2022, n=8,000 consumers.

for consumers who require more testing and persuasion before deciding on the purchase of a high-engagement product or service. AR, in particular, is starting to overcome the barriers to selling high-ticket items online: a number of furniture retailers, for instance, have launched AR or MR apps that allow consumers to place digitalized, to-scale images of furniture in their living rooms virtually. Some include extensive room-design features.

The high-engagement segment is the only area where consumers rated physical experiences as more important than digital experiences. More than two in three consumers (69%) believe the immersive digital experience will lead to them making more purchases online. Alongside this, 77% of consumers agree that interactive experiences will enable them to make better purchase decisions. This has the potential to reduce return rates considerably in e-commerce. A significant benefit of this is improved sustainability; lower returns mean lower transportation miles and landfill use.

Among the sectors in consideration, the majority of consumers believe that retail, training and education, and life sciences are the sectors where immersive experiences would be impactful and valuable to them (see Figure 6). Several leading organizations recognize the opportunity that an immersive space presents and have been investing in this. Ikea, Wayfair, Home Depot, Amazon, and Warby Parker are some of the household brands already using AR to allow consumers to experience products virtually in their homes.[7] Luxury retail is another segment where immersive experiences can be very impactful.

Immersive technologies are gaining traction in training and education. Immersive training improves comprehension and retention compared to existing online or classroom formats. AR, VR, and MR, for example, can play a more significant role, allowing learners to develop their skills and knowledge in a non-judgmental, low-consequence environment, without expending significant resources.[8] This would be particularly useful for professionals such as surgeons, nurses, and firefighters, for example. MR medical training using Microsoft's HoloLens Tool has reportedly increased training efficiency by 60% in medical students, while saving $1,440 per trainee.[9]

The Cincinnati Children's Hospital Medical Center uses VR to find long-term solutions for patients by "virtualizing" a surgery prior to the actual operation[10] or converting MRI scans into 3D representations for surgeons to manipulate in a virtual space to optimize the selection, size, and placement of ventricular assist devices in the surgical planning stage.[11]

Fig.6

A majority of consumers find immersive experiences in retail shopping, training, and education valuable and impactful
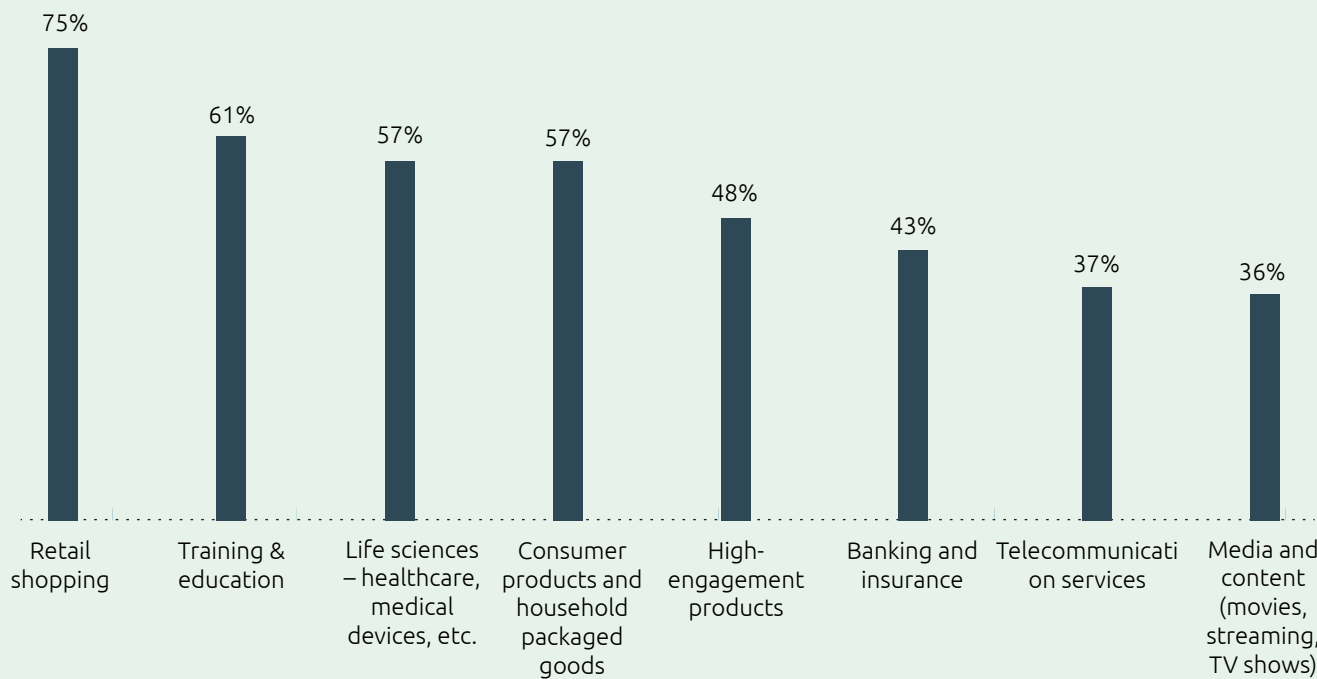
60%

improvement reported in training efficiency in medical students using Microsoft's HoloLens[9]

Organizations see the potential of immersive experiences for consumers, yet scaling remains a challenge

Organizations we surveyed recognize the opportunity immersive experiences present, as Figure 7 shows. Seven out of ten organizations believe that immersive experiences will be a key differentiator in the market.

Percentage of consumers who state immersive experiences might be impactful and valuable in the sector stated

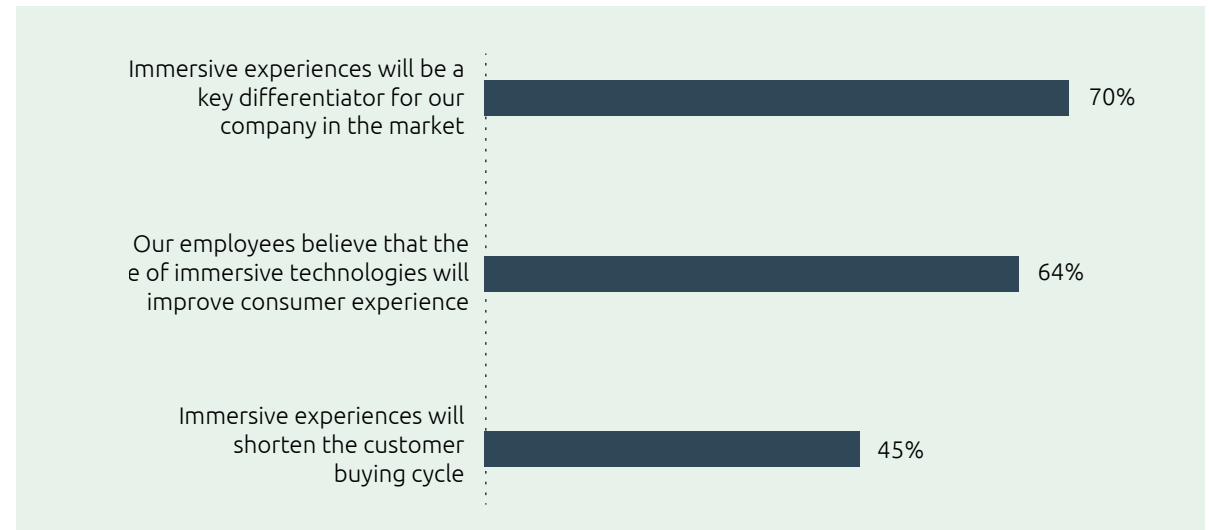| Sector	Percentage
Retail shopping	75%
Training & education	61%
Life sciences – healthcare, medical devices, etc.	57%
Consumer products and household packaged goods	57%
High-engagement products	48%
Banking and insurance	43%
Telecommunication services	37%
Media and content (movies, streaming, TV shows)	36%

Source: Capgemini Research Institute, immersive technology – consumer survey, July–August 2022, n=8,000 consumers. The above numbers represent the average of consumer responses from the various stages of buying cycle – awareness and consideration, selection and purchase, usage, and support.

Fig.7

Seven out of ten organizations believe immersive experiences would be a key differentiator in the market

Room Planner by West Elm, the American consumer retail company, for instance, allows the user to map out a room, drag and drop items from its catalog.[12]
Ben Houston, co-founder of Threekit, a 3D-product-configurator firm explains the impact of this use case: *"The furniture market has been a massive adopter of AR. Organizations like IKEA have made their whole catalog virtual. They have lots of options; there might be 500 fabrics or 12 styles. And they've learned that, if consumers can see the exact model they're considering, they're much more likely to buy."* Similarly, Nike's Nike Fit scans a customer's feet through their smartphone's camera to check their shoe size by collecting 13 data points that map the foot's shape with high accuracy. Cosmetics brands such as L'Oréal, MAC Cosmetics, and Chanel allow users to try on their lipstick or eyeshadow virtually.[13]

Immersive experiences will be a key differentiator for our company in the market	70%
Our employees believe that the use of immersive technologies will improve consumer experience	64%
Immersive experiences will shorten the customer buying cycle	45%

Source: Capgemini Research Institute, immersive technology – executive survey, July–August 2022, n=1,000 organizations.
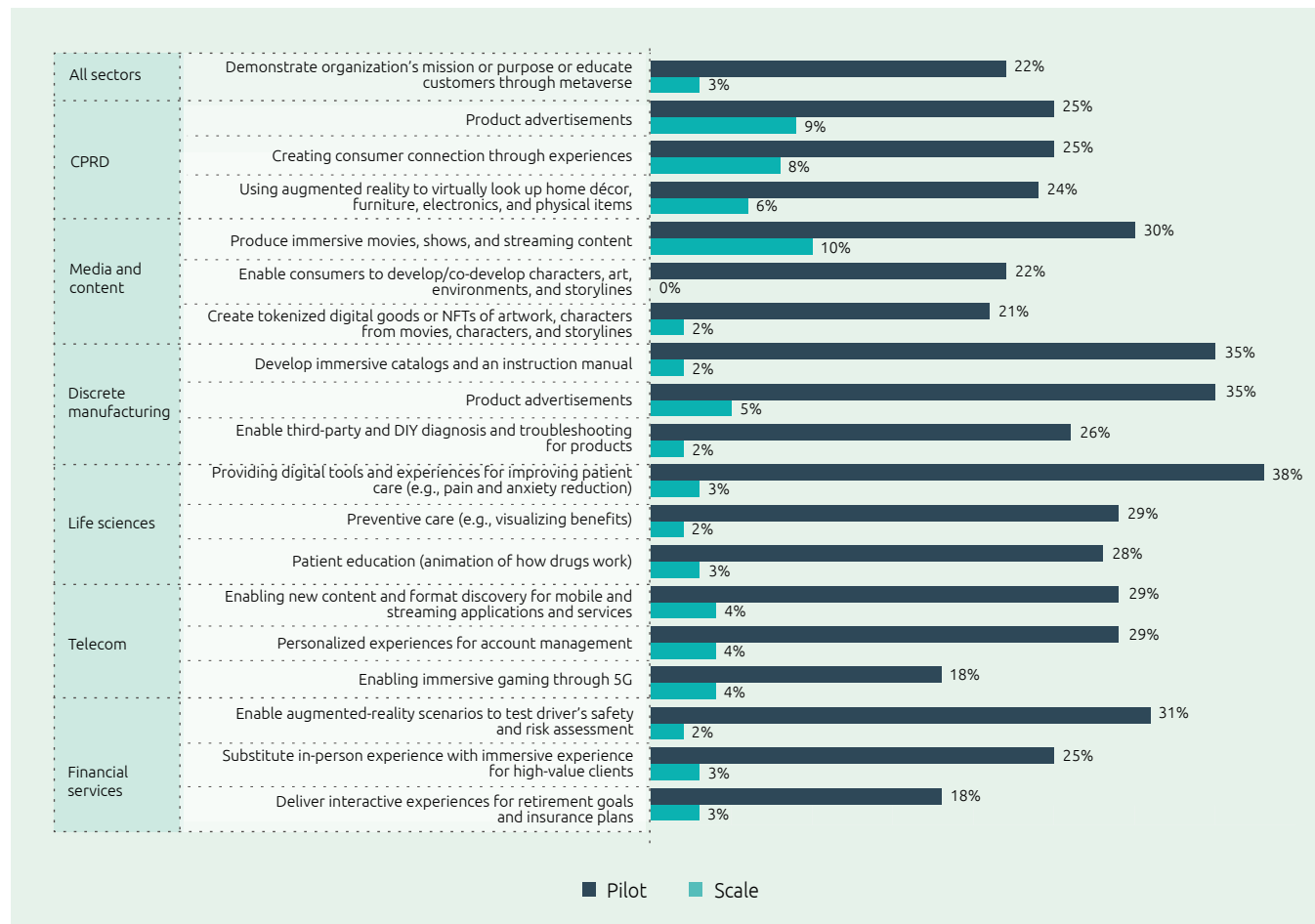
"The furniture market has been a massive adopter of AR. Organizations like IKEA have made their whole catalog virtual. They have lots of options; there might be 500 fabrics or 12 styles. And they've learned that, if consumers can see the exact model they're considering, they're much more likely to buy."

Ben Houston

Co-founder of Threekit

Fig.8

Very few organizations are scaling consumer-focused immersive initiatives

Sector	Initiative	Pilot	Scale
All sectors	Demonstrate organization's mission or purpose or educate customers through metaverse	22%	3%
CPRD	Product advertisements	25%	9%
	Creating consumer connection through experiences	25%	8%
	Using augmented reality to virtually look up home décor, furniture, electronics, and physical items	24%	6%
Media and content	Produce immersive movies, shows, and streaming content	30%	10%
	Enable consumers to develop/co-develop characters, art, environments, and storylines	22%	0%
	Create tokenized digital goods or NFTs of artwork, characters from movies, characters, and storylines	21%	2%
Discrete manufacturing	Develop immersive catalogs and an instruction manual	35%	2%
	Product advertisements	35%	5%
	Enable third-party and DIY diagnosis and troubleshooting for products	26%	2%
Life sciences	Providing digital tools and experiences for improving patient care (e.g., pain and anxiety reduction)	38%	3%
	Preventive care (e.g., visualizing benefits)	29%	2%
	Patient education (animation of how drugs work)	28%	3%
Telecom	Enabling new content and format discovery for mobile and streaming applications and services	29%	4%
	Personalized experiences for account management	29%	4%
	Enabling immersive gaming through 5G	18%	4%
Financial services	Enable augmented-reality scenarios to test driver's safety and risk assessment	31%	2%
	Substitute in-person experience with immersive experience for high-value clients	25%	3%
	Deliver interactive experiences for retirement goals and insurance plans	18%	3%

■ Pilot ■ Scale

Despite the optimism and a number of pilots, we found that only a handful of organizations are scaling these initiatives (see Figure 8). We will look at a few reasons for this low scaling in the next section.
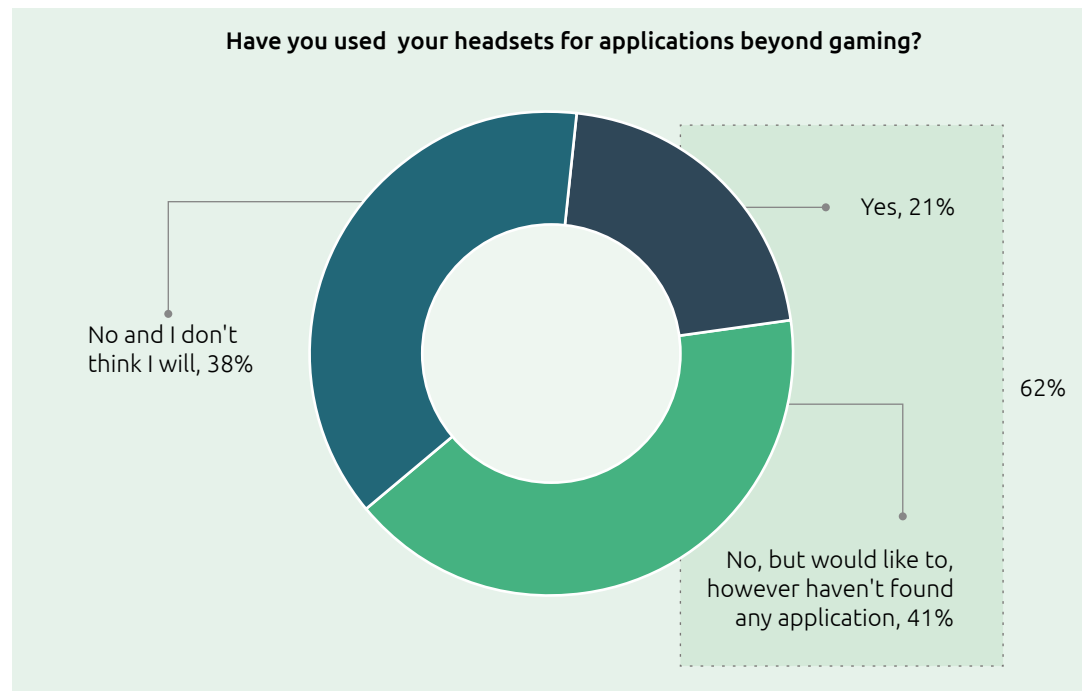
Fig.9

Organizations have an opportunity to tap current AR/VR headset-owning consumers, but should prioritize web and mobile-based experiences more

Three in five (62%) of consumers that own AR/VR headsets would like to try applications beyond gaming

We found that there is an opportunity for brands to engage with consumers who own AR/VR headsets. In our survey, out of the consumers that own a headset already:

- Three in five (**62**%) have used or would like to use their headsets for applications beyond gaming
- Three in five (**60**%) are willing to use their headsets for interacting with brands, companies, or their applications
- **59**% would like to experience more products and services through these headsets (e.g., browsing products or experiencing services before purchase)

Have you used your headsets for applications beyond gaming?

No and I don't think I will, 38%

Yes, 21%

62%

No, but would like to, however haven't found any application, 41%

Source: Capgemini Research Institute, immersive technology – consumer survey, July–August 2022, n=710 consumers in our survey with AR/VR headsets.

Capgemini Research Institute 2022

Fig.10

Immersive experiences for web and mobile, having high importance, are less prioritized
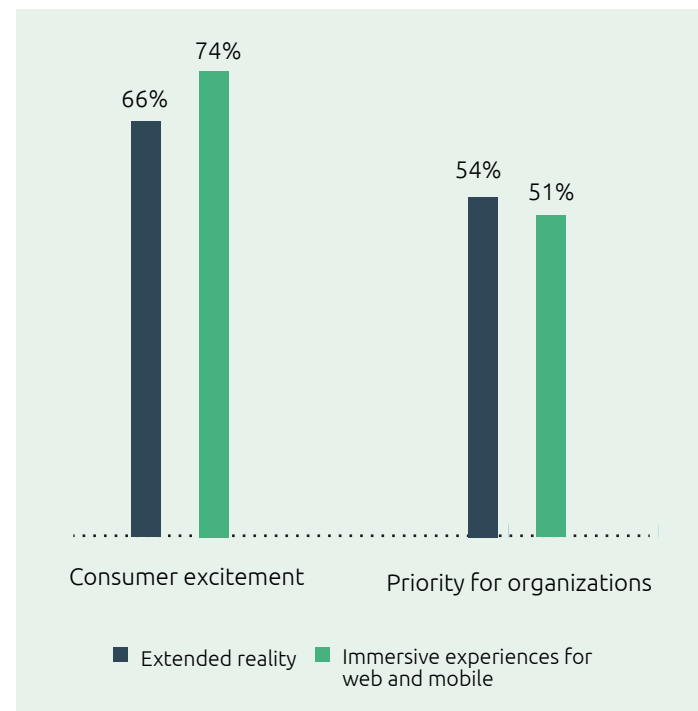
This is a consumer segment that is familiar with the headsets and has already invested in the hardware, meaning a lower barrier to entry and, therefore, an opportunity for organizations. They have the option of introducing product demos or immersive showroom experiences, or even gamification to engage with this segment.

Our survey sample also includes consumers who do not own a headset or see any reason to. Yet three in five among this sample (61%) are willing to use an immersive application on mobile or the web. Furthermore, from our consumer study, we found that consumers are more excited about immersive

experiences on the web or mobile (74%), compared to using AR/VR headsets (66%) (see Figure 10). However, when we probed industry respondents on the priority of these technologies for organizations, it was slightly higher for AR/VR at 54% compared to that of web and mobile experiences (51%). Consumer-product and retail organizations have aligned their implementation efforts with consumer expectations, with many brands launching mobile-based apps or experiences. However, there needs to be a broad recognition of consumer hesitation and concerns about the use of headsets.

Consumer excitement — Extended reality 66%, Immersive experiences for web and mobile 74%

Priority for organizations — Extended reality 54%, Immersive experiences for web and mobile 51%

■ Extended reality ■ Immersive experiences for web and mobile

Source: Capgemini Research Institute, immersive technology – consumer survey, July–August 2022, n=8,000 consumers; immersive technology – executive survey, July–August 2022, n=1,000 organizations.

02

IMMERSIVE EXPERIENCES ALSO BENEFIT ORGANIZATIONS' INTERNAL OPERATIONS

A few organizations are betting on immersive tech to deliver operational excellence

Immersive tech has been in operational use for more than a decade. Industries such as automotive, aerospace, and defense rely on MR for a variety of applications, including training, remote operations, and design collaboration. Our previous research found that AR is more widely implemented compared to VR, while the benefits from both these technologies range from higher productivity and efficiency to increased safety.[14] Immersive experiences facilitate access to expert assistance (remote support, training, or calibration/rollout) with less traveling. This allows organizations to bring specialized expertise to the shop floor.
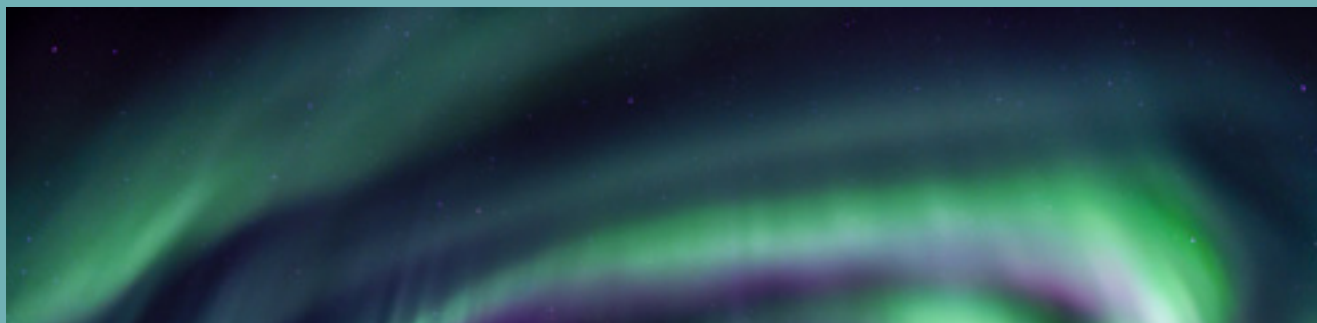
How immersive experiences benefit operations

Aerospace and Defense:

Airbus uses AR, VR, and MR across its operations. It has designed and deployed VR tools for the aircraft-design process and Airbus engineers use VR to visualize, interact with, and adjust 3D digital models of aircraft before developing the physical parts. This allows them to simulate specific situations in a safe environment. Similarly, using AR glasses, electrical teams can look at the various parts of virtual harness cables superimposed onto the physical aircraft. This kind of hands-free guidance allows 25% faster installation.[15]

As explained by an executive from an aerospace company, "Immersive technologies have been in [our firm] for a while, in maintenance solutions and training. With the advancements in technology and what is happening around us, it's been accelerated more than ever."

Automotive:

Ford and Bosch have developed a VR tool that allows Ford to train its technicians to service and maintain the all-electric Mustang Mach-E. Technicians are trained using VR headsets on diagnosis and tasks such as installation, removal, and servicing of the main battery. Dave Johnson, Director of Ford Service Engineering Operations, says: "This new VR training tool allows technicians to understand the components and steps required to service these high-voltage systems, then confidently perform diagnostics and maintenance."[16]

Healthcare:

A US-based startup, SentiAR, is working on an AR tool that can guide surgeons during cardiac and other invasive interventions. Through a wearable headset, the system presents a 3D image of the patient's heart and the position of catheters and has demonstrated up to 50% improvement in point-navigation accuracy.[17]
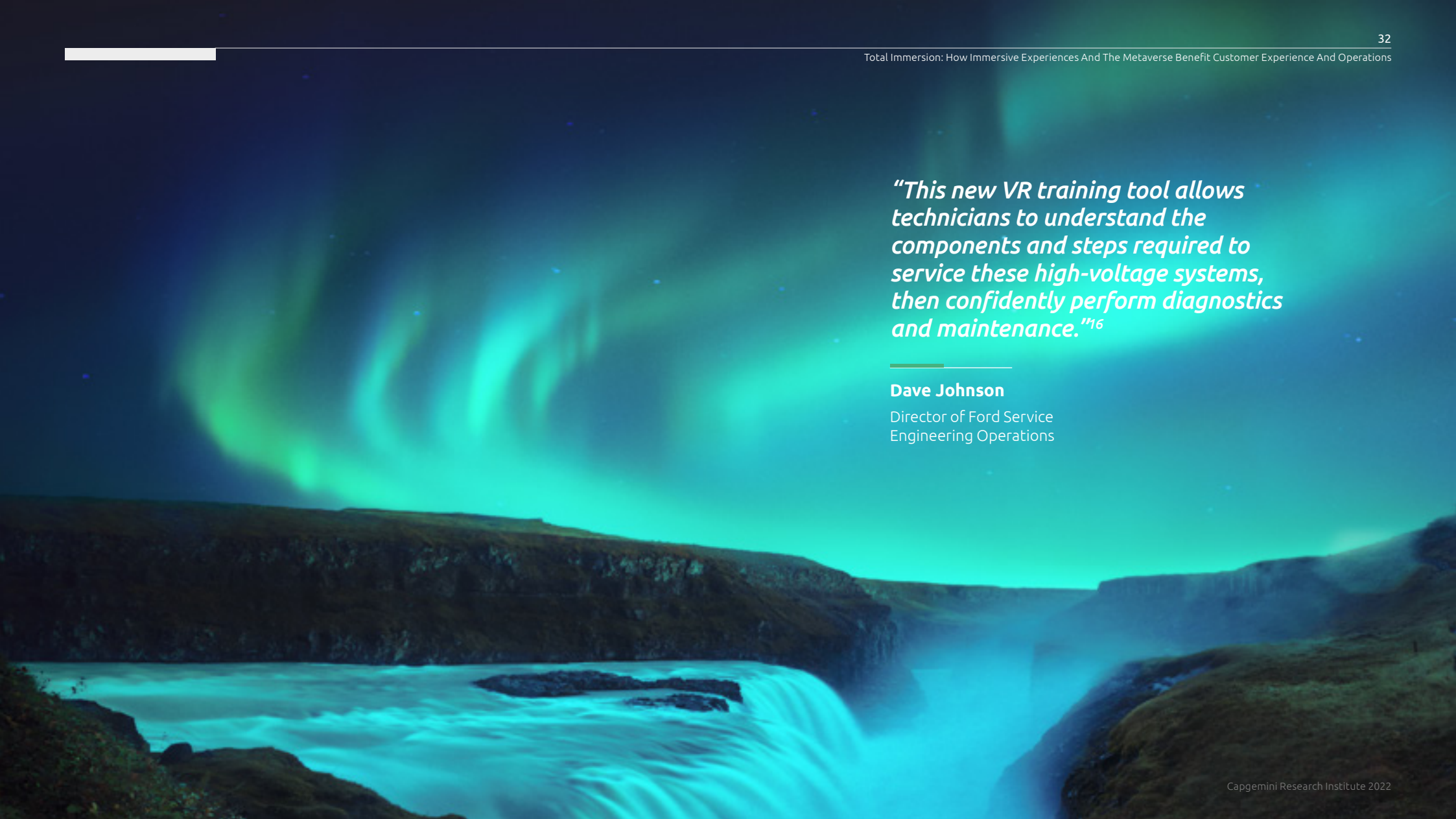
Insurance:

Allianz, the German multinational financial services firm, uses AR to improve its claims process. Its adjusters conduct live-video assessments of claims damage from remote locations using AR and AI, and collect the required data, such as photos, signatures, and geolocation. In less than a year of using this process, the company has processed over 100,000 remote claims; has cut down travel by more than 6 million km, and improved claim-resolution times,[18] enabling considerable economic saving and improved sustainability.

Allianz used AR to improve its claims process and cut down travel by more than

6 million km

"This new VR training tool allows technicians to understand the components and steps required to service these high-voltage systems, then confidently perform diagnostics and maintenance."[16]

Dave Johnson

Director of Ford Service Engineering Operations

Organizations recognize the opportunity immersive technologies present

In our research, we found that organizations recognize the benefits provided by immersive technologies and want to take advantage of them. Two in three organizations (65%) have mentioned that their employees believe that immersive technologies will help them do their jobs better. The benefits cited by organizations range from improved collaboration and increased operational efficiency to reduced turnaround times and greater cost savings. Elaborating on the valuable use cases of immersive applications, Dr Hendrik Witt, chief product officer, TeamViewer comments: *"Immersive technology is about speeding up your processes, lowering your error rates and improving quality in the process. Oftentimes, this is achieved through wearable computing solutions. Moreover, you can make processes for frontline workers in different industries more intuitive and flexible if you let them wear the equipment they need."*

"Immersive technology is about speeding up your processes, lowering your error rates and improving quality in the process. Oftentimes, this is achieved through wearable computing solutions. Moreover, you can make processes for frontline workers in different industries more intuitive and flexible if you let them wear the equipment they need."

Dr Hendrik Witt

Chief product officer, TeamViewer

Based on our survey of 1,000 organizations, we highlight below the two most implemented immersive use cases for internal operations, in selected sectors:

Sector	Use case	Description
Consumer products, retail and distribution	Retail floor planning	By viewing the retail floor virtually, organizations can design store layout without teams having to travel to physical stores.
	Logistics and operations visualization	Visualizing the final product/network/route before deployment/embarkation. For example, drivers can check their routes using heads-up displays, reducing the risk of accidents while allowing more efficient route-planning. Within warehouses, AR can help employees locate the product/part they want. Similarly, AR markers can help logistics teams track packages.
Discrete manufacturing	Remote operations	AR-based remote assistance allows operators to collaborate in real time, solve problems, and thereby improve operational efficiency. Toyota has been able to improve safety and communication across its plants and increase security compliance through augmented remote assistance.[19]
	Testing and digital prototyping	The automotive industry, in particular, has relied on VR for design and engineering reviews. By reducing the number of prototypes built, organizations can save millions of dollars while enabling considerable environmental savings.[20]
Financial services	Financial advising and support	Insurance companies are using AR-based solutions to collect images of insured property (cars, houses, etc.) that has claims against it with better accuracy, and for faster claims processing, thereby improving customer satisfaction scores. Lercari Group, an Italian claims-management organization, saw an increase in its NPS scores from the mid-80s to over 90% through the use of interactive AR solutions.[21]
	Financial-data visualization	VR can make the data visualization process more immersive. Financial information can be presented in a 3D visual space, enabling analysts to draw more intuitive, faster insights.[22]
Life sciences	Process-flow visualization	Similar to data visualization, VR can make process-flow visualization easier and faster to access and understand. This can, for example, help to train surgeons in the use of new medical devices. A clinical validation study found that VR training improved overall surgical performance by 230% when compared to traditional training methods.[23]
	Training and education of medical professionals	A US startup enables surgeons to plan and rehearse surgical procedures using Oculus headsets and 3D scans of patients.[24]

Based on our survey of 1,000 organizations, we highlight below the two most implemented immersive use cases for internal operations, in selected sectors:

Sector	Use case	Description
Media, Entertainment, and Content	Using immersive technologies to develop facial and movement tracking for characters	Hardware advances are allowing richer tracking of digital avatars. For instance, Apple's ARKit allows motion capture of a person in real time with a single camera and even tracking of multiple faces on some devices.[25]
	Using AR/VR to develop set designs, avatars, and costume production	AR/VR can make designing studio sets, avatars, or even costumes much simpler by allowing designers to collaborate virtually and remotely without being on site.
Telecom	On-field support	Telecom employees working on complex networks or machinery can access support from experts through XR. Similarly, technicians can scan components of machines they are working on through their AR headsets or AR-enabled smartphones and read detailed information about these components.
	Remote assistance	With the help of XR, telecom companies can enable field service engineers to handle a range of issues and ensure support is available as and when required.
All sectors	Training employees on safety, product features, and processes	Industrial training is a useful application of digital-twin-enabled XR. These tools can replicate workplace scenarios with the help of the data from digital twins, facilitating training in a safe environment. Immersive Field Simulator, a VR- and MR-based training tool, provides targeted, on-demand, skills-based training for workers by creating a digital twin of the physical plant. [26]
	Recruitment	Metaverse-based hiring has gained attention in recent months. Samsung Electronics uses the metaverse platform, Gather Town, to connect with jobseekers.[27]
	Employee onboarding	Organizations can make the onboarding process more engaging through the metaverse. Wunderman Thompson, a global advertising agency, had a metaverse onboarding event for employees hired during the pandemic.*"Everyone remembers who they started with on their first day at work and, through the metaverse, these connections don't have to be limited to one geographic location during orientation,"* explains Bas Korsten, Global Chief Creative Officer at Wunderman Thompson.[28]

Two in three organizations have developed a short-term roadmap for immersive initiatives

Brands are increasingly incorporating immersive initiatives into their product roadmaps. Two in three organizations have developed a short-term roadmap (i.e., for the next 1–2 years) for immersive initiatives. Wayfair's Co-Founder and Co-Chairman, Steven Conine, is keen to focus on the technology:

"Ideally, I think, in the future, every home in the US will have a 3D model associated with it. We could have a design-services team in our store who could give you a very personalized experience and help you visualize products in your space, help guarantee that it will fit, it will flow well, and it's the look and style you want." [29]

Steven Conine

Wayfair's Co-Founder and Co-Chairman

Industrial metaverse is further strengthening operations

Manufacturers can take advantage of the benefits offered by the industrial metaverse, such as improved time to market and cost savings. The industrial metaverse harnesses various technologies, including XR, IoT, and connectivity.

Digital twins in an industrial metaverse, for example, allows organizations to conduct simulation-based scenario planning, reducing design time and time to operate. The Renault Group, for instance, is strengthening its digitalization with industrial metaverse. One hundred percent of the company's production lines (8,500 pieces of equipment) and 100 percent of supply chain data are hosted in the Renault Group

Metaverse, and the company is able to monitor 90 percent of its supply flows. Through this and its digitalization efforts, the company is hoping to achieve a 60 percent reduction in vehicle delivery time, reduce the carbon footprint of its vehicle manufacturing by half, and also achieve a significant reduction in innovation cycle.[30] Similarly, BMW created a digital twin of one of its factories and was able to optimize production time and cost. The company was able to simulate 300 chassis running on a conveyor belt and optimize employee safety. [31] Ericsson is using Nvidia's Omniverse platform to build virtual versions of real cities to determine the optimal placement of its antennas.[32]

100%

of Renault Group's production lines (8,500 pieces of equipment) and 100 percent of supply chain data is hosted in the Renault Group Metaverse

300

BMW was able to simulate 300 chassis running on a conveyor belt and optimize employee safety.

"OUR CONVERSATION WITH PAULO MATOS, DIRECTOR GENERAL OF TOMMY HILFIGER, BRAZIL

What is the potential of the metaverse and immersive technologies?

When we launch a new collection, we are looking to establish a strong brand presence. So, we try to bring our Tommy Hilfiger ambience to the location. We successfully created this brand experience in the metaverse. It saved us on cost of travel and building physical branding. Moreover, I was pleasantly surprised to see our commercial reps and sales team showcasing this metaverse experience on their personal Instagram.

What are the benefits or outcomes that you saw in developing the metaverse for internal operations?

You can create whatever you think, whatever you dream. Then, it is cost: you can avoid several trips to get everybody together, for sales training, for brand summit, for commercial launch. I see a lot of opportunities to make our companies hybrid with the metaverse. So, combining physical and digital worlds to spread your brand, to spread your communication, your thoughts, and your strategy. Internally, I also see a very big opportunity for training. It is a continuous process.

Apart from internal operations, Tommy Hilfiger has also taken steps to develop the metaverse for consumers:

As part of their presence at New York Fashion Week, it will livestream on Roblox its "See now, Buy now" collection. It includes avatars dressed from the collection walking through a virtual version of New York City. It is all part of its "phygital" fashion presentation.[33]

Tommy Hilfiger also joined the Metaverse Fashion Week, where it established a pop-up in the virtual retail space in the Decentraland platform. Here, visiting consumers were able to see 3D incarnations of actual physical merchandise. As stated by Martijn Hagman, CEO of Tommy Hilfiger Global: *"So far, consumers are showing an appetite for these interactions, and we are committed to being relevant on their journey."*[34]

"So far, consumers are showing an appetite for these interactions, and we are committed to being relevant on their journey."

Martijn Hagman
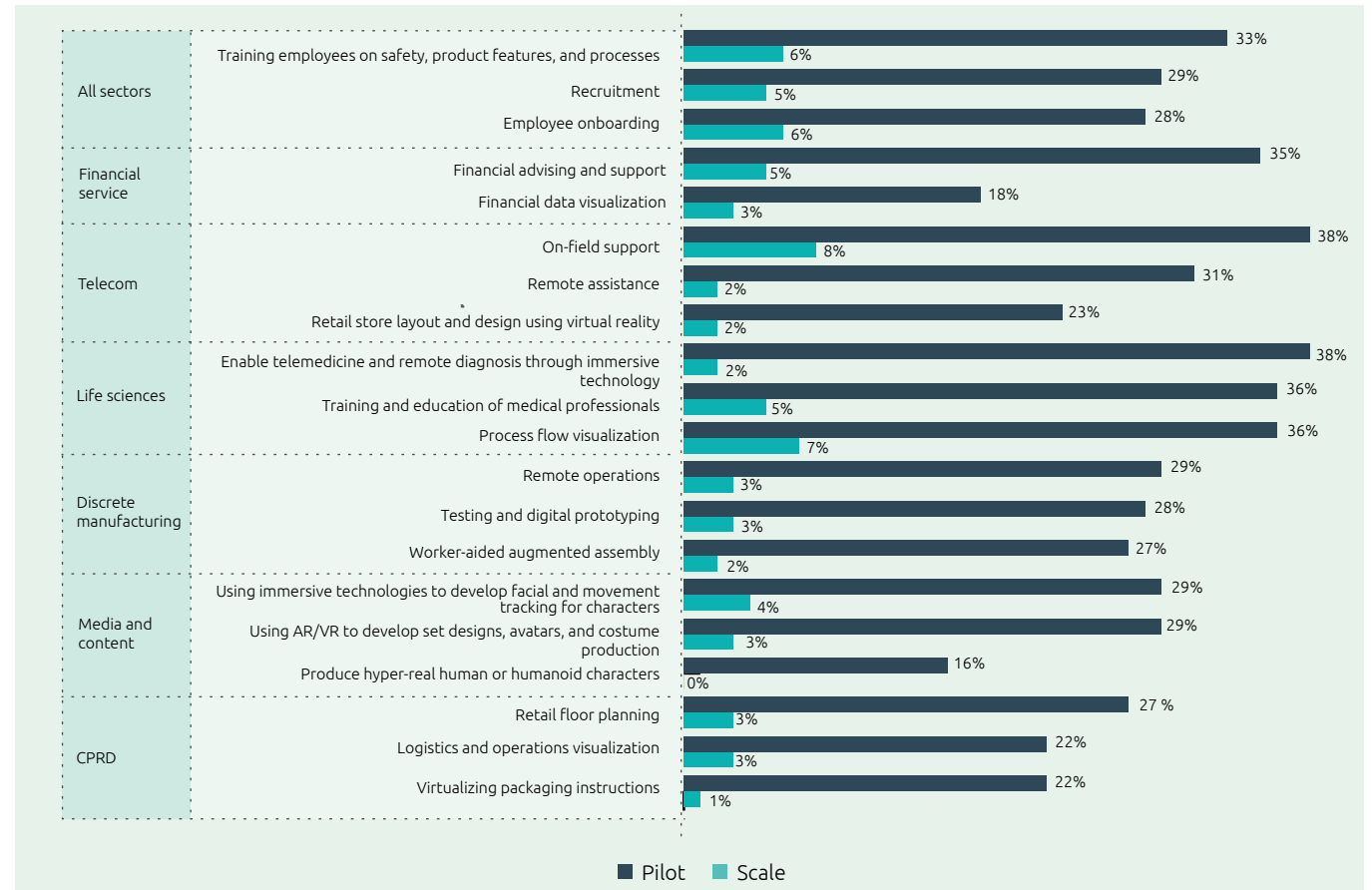
CEO of Tommy Hilfiger Global

Despite the benefits, only a few organizations are piloting initiatives

While there is a clear interest across sectors, with more than one in three discrete manufacturing organizations and around 30% of other industries piloting the immersive technology initiatives shown in Figure 11, only a handful of organizations are scaling these initiatives.

Some of the challenges that organizations have cited in relation to lack of scaling are shown in Figure 12. Lack of consumer adoption is a concern for more than 60% of organizations, followed by low technology maturity and affordability. These factors are probably driving the lack of management support for these initiatives, as cited by 62% of organizations.

Fig.11

Very few organizations are scaling the immersive initiatives for internal operations

		Pilot	Scale
All sectors	Training employees on safety, product features, and processes	33%	6%
	Recruitment	29%	5%
	Employee onboarding	28%	6%
Financial service	Financial advising and support	35%	5%
	Financial data visualization	18%	3%
Telecom	On-field support	38%	8%
	Remote assistance	31%	2%
	Retail store layout and design using virtual reality *	23%	2%
Life sciences	Enable telemedicine and remote diagnosis through immersive technology	38%	2%
	Training and education of medical professionals	36%	5%
	Process flow visualization	36%	7%
Discrete manufacturing	Remote operations	29%	3%
	Testing and digital prototyping	28%	3%
	Worker-aided augmented assembly	27%	2%
Media and content	Using immersive technologies to develop facial and movement tracking for characters	29%	4%
	Using AR/VR to develop set designs, avatars, and costume production	29%	3%
	Produce hyper-real human or humanoid characters	16%	0%
CPRD	Retail floor planning	27%	3%
	Logistics and operations visualization	22%	3%
	Virtualizing packaging instructions	22%	1%

Source: Capgemini Research Institute, immersive technology – executive survey, July–August 2022, n=640 organizations globally, n=158 CPRD, n=73 media and content, n=213 discrete manufacturing, n=58 life sciences, n=64 telecom, n=74 financial services organizations.
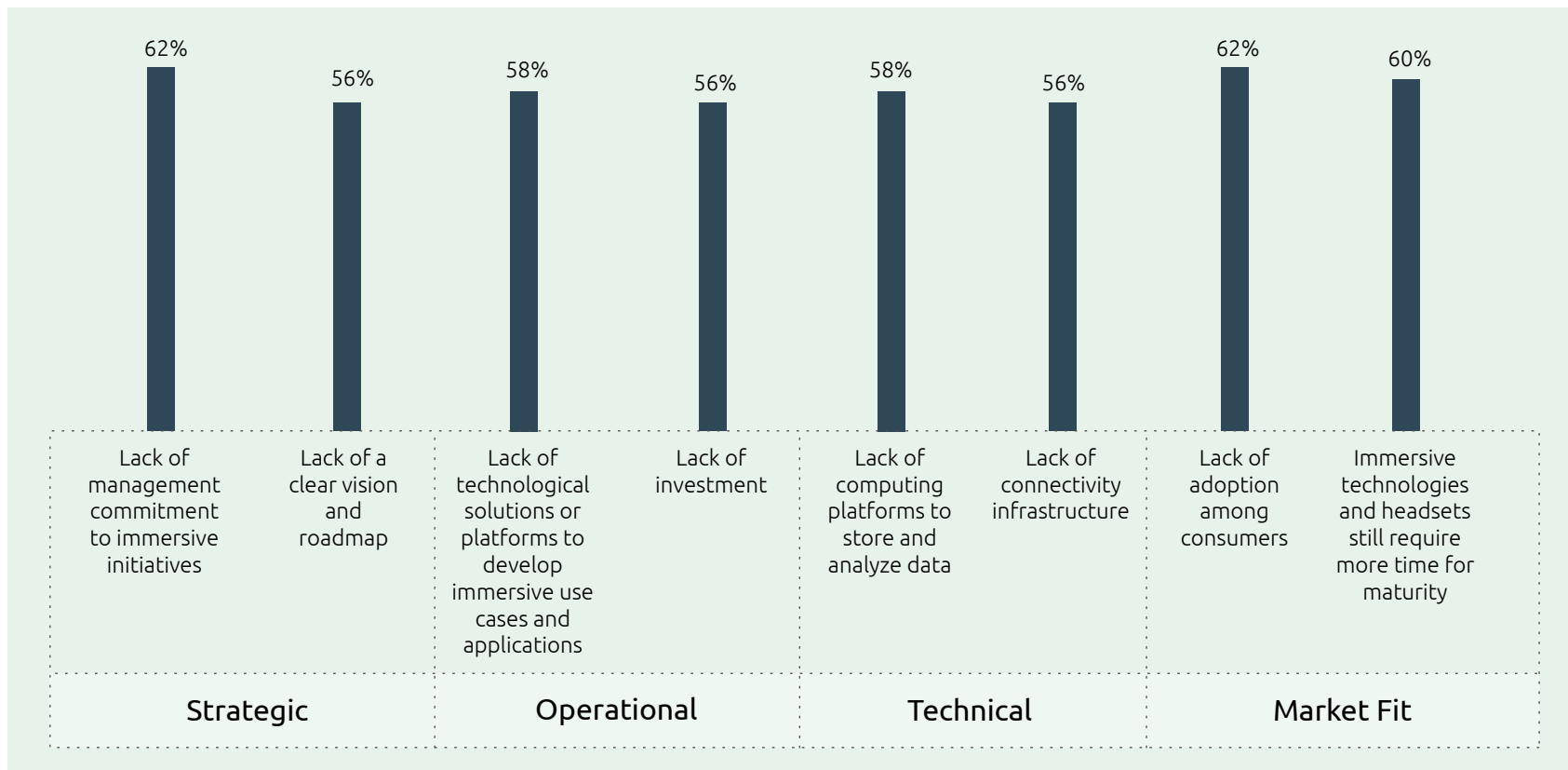
"We needed AI and AR that could seamlessly adapt to different skin tones and face shapes. We require the same sense of inclusivity with our technology that we embrace in our products."[4]

Sonia Anand

Executive Director, Global Digital Retail Innovation, MAC Cosmetics

Fig.12

Low consumer adoption and lack of management commitment results in a lack of scaling

62%	56%	58%	56%	58%	56%	62%	60%
Lack of management commitment to immersive initiatives	Lack of a clear vision and roadmap	Lack of technological solutions or platforms to develop immersive use cases and applications	Lack of investment	Lack of computing platforms to store and analyze data	Lack of connectivity infrastructure	Lack of adoption among consumers	Immersive technologies and headsets still require more time for maturity
Strategic		Operational		Technical		Market Fit	

Source: Capgemini Research Institute, immersive technology – executive survey, July–August 2022, n=1,000 organizations.

Low adoption of mixed reality glasses is a challenge that organizations are dabbling with. On being asked, whether it's worrisome to think about "how quickly we're going to have the hardware to enable some of these metaverse experiences", John Riccitiello, the CEO of Unity Technologies, responds, *"The companies that are making platforms need to talk to us, because when they ship hardware, they need to be Unity-compliant long before [launch]. I am a massive believer that, by the end of this decade, AR/VR will be a normal part of our lives. Will it be as big as mobile phones? I don't think so. Will it be as big or bigger than consoles? Probably. So, [AR/VR] in that time frame will be a very big niche in my opinion."*[35]

In nearly 40% of organizations, immersive initiatives are still considered one-off projects, rather than one link in a chain of continuous improvement. Another probable reason for the lack of scaling is the absence of strong central governance. We found that two in three organizations have decentralized governance, with each business unit framing and governing its own initiatives. So, even if pilot projects are found to be successful, scaling them across the enterprise or in other locations could run into a number of function-specific challenges.

03

CONSUMER INTEREST PROPELS THE METAVERSE TO THE FORE

The metaverse is the intersection of various immersive technologies. It holds the promise of strikingly new consumer interactions and experiences, in the same way that social media, HTML, and graphical user interfaces did before it.

The core concept of the metaverse is not unfamiliar, however. Hollywood blockbuster TRON brought it to mainstream attention as early as 1982. While virtual interactive worlds have long been thought of as confined to science fiction and films, today, with ever-improving displays and computing capabilities, the metaverse is close to bringing these possibilities to our reality. To quote Satya Nadella, Chairman and CEO of Microsoft: *"The metaverse is here, and it's not only transforming how we see the world but how we participate in it – from the factory floor to the meeting room."*[36]

Industries such as media and entertainment have tapped into the metaverse to bring new experiences to consumers. The number of people attending virtual events soared after the pandemic. Epic Games, for example, hosted multiple rock concerts within its online game Fortnite, which were viewed by millions of viewers and boosted sales by the artists by millions of dollars.[37] While meaningful interaction is currently only possible in relatively small groups, the potential for mass interaction is there.

The metaverse is also gaining interest from sports organizations. The North American National Basketball Association (NBA), in collaboration with Niantic, the maker of Pokémon GO, has announced the launch of NBA All-World, which will overlay a video-game environment on a real-world map, using real-world basketball courts for virtual games, allowing players to choose any location.[38]

The metaverse has the potential to open new markets and create new ways of interacting and working. In this chapter, we seek to understand consumer preferences and challenges to adoption.

Nine in ten consumers are curious about the metaverse

Currently, the strongest wave of interest for the metaverse comes from tech enthusiasts, who account for only 4% of our survey population (see insert – *"Who are the metaverse's early adopters?"*). We call this 4% of our sample population "metaverse-experienced consumers."

This lack of widespread adoption, however, does not imply a lack of consumer attention or interest. Today, 93% of adult consumers surveyed are metaverse-curious (see Figure 13). They comprise the following categories:

- Consumers who would use the metaverse when it becomes accessible to them – 51% of the survey population
- Consumers who would use it once their friends and family use it – 31% of the survey population
- Consumers who would use it, but not in its current form – 11% of the survey population

51%
Consumers who would use the metaverse when it becomes accessible to them
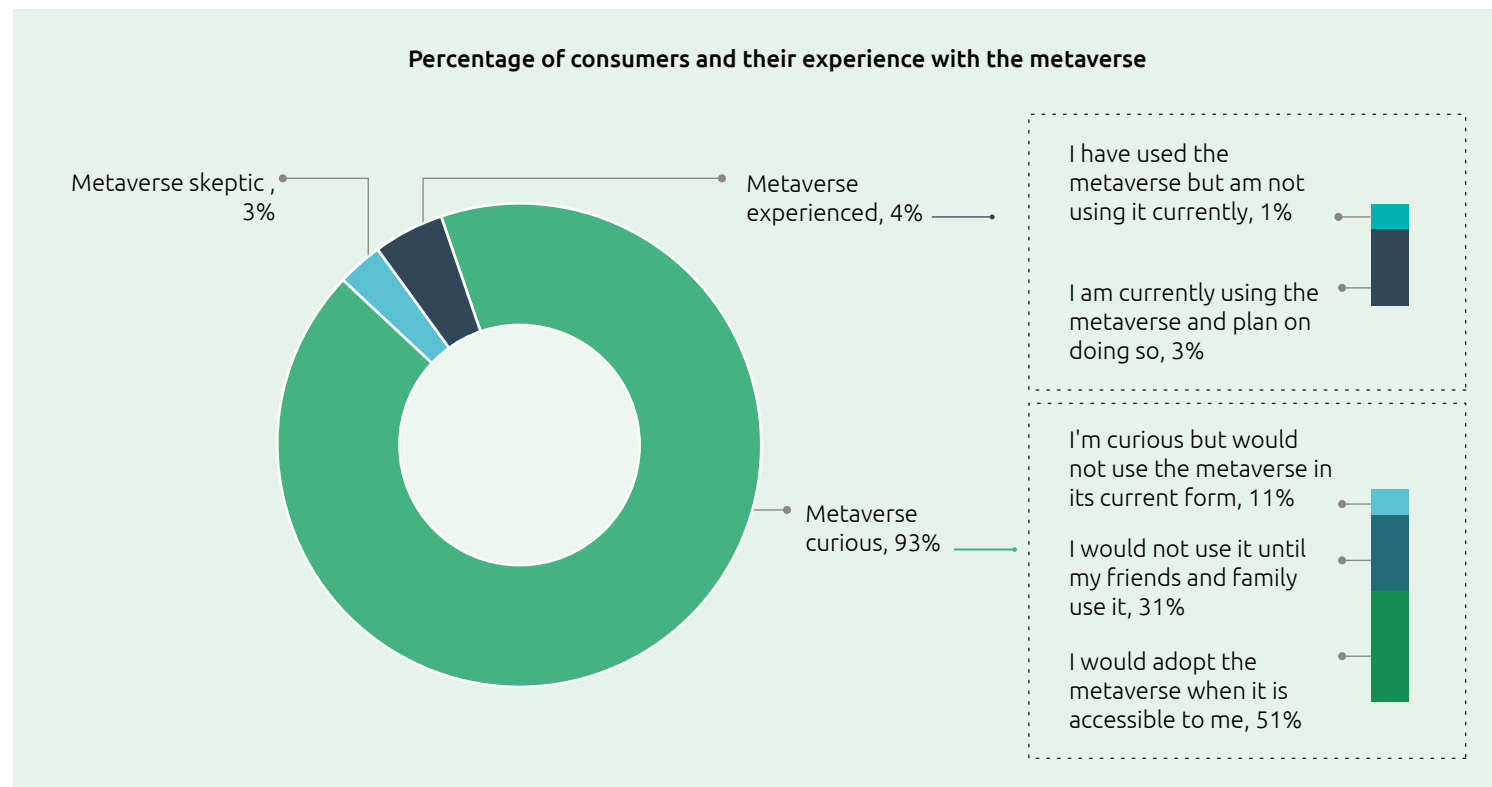
11%
Consumers who would use it, but not in its current form

31%
Consumers who would use it when their friends and family use it

Fig.13

More than nine in ten consumers are curious about the metaverse

Percentage of consumers and their experience with the metaverse

Metaverse skeptic , 3%

Metaverse experienced, 4%

Metaverse curious, 93%

I have used the metaverse but am not using it currently, 1%

I am currently using the metaverse and plan on doing so, 3%

I'm curious but would not use the metaverse in its current form, 11%

I would not use it until my friends and family use it, 31%

I would adopt the metaverse when it is accessible to me, 51%

Source: Capgemini Research Institute, Immersive technology – consumer survey, July–August 2022, n=8,000 consumers.

Our survey also shows that more than half (55%) of consumers are excited about the metaverse. This concurs with findings from our analysis of 180,000 social media mentions of the metaverse: 37% of tweets featuring the metaverse are positive with a mere 7% being negative, even though most consumers are currently not able to engage extensively with the metaverse, indicating a high level of anticipation.

This presents a unique opportunity to organizations and brands to create a strong metaverse presence – getting in on the ground floor and securing a distinct competitive advantage. As Hélène LABAUME, director of innovation at Carrefour, states: *"If the metaverse succeeds – and the numbers lead us to believe it will – we can have a head start as first movers."*

A NOTE ON CONSUMER DEMOGRAPHICS

As our sample consumers are 18 and over, the proportion of metaverse-experienced consumers in our survey is only 4%. However, when we additionally consider the audience of gaming platforms (Fortnite, Roblox, etc.) who are under 18, this proportion could increase. For instance, a majority of consumers who use the Roblox platform today are below 18,[39] and they are not included in our survey population. Sixty-seven percent of Roblox users are under 16. The active users of these platforms indicate the potential scale of the metaverse as at the end of Q2 2022, Roblox had registered 52.2 million daily active users (DAU) and 11.3 billion cumulative hours engaged at the end of Q2 2022.[40] There are estimated to be around 400 million monthly active users (MAU) of Roblox.

TWEETS HIGHLIGHTING THE EXCITEMENT ABOUT THE POSSIBILITIES OF THE METAVERSE

"So nice of @ adidasoriginals to provide all new retail minters a truthfully ruggy experience of what it's like to enter this space. Welcome to the metaverse indeed."

"Gucci made a physical collection and a special experience in Roblox. I'm not a gamer but the aesthetic is🤩. Does the game of life count?"

"It took the internet at least 15 years to dramatically reshape #banking – and mobile phones less than half that time! Thus, it is reasonable to believe that VR- and AR-enabled #metaverse banking will develop even faster."

"Seeing this avatar speak makes me want to be one in the Metaverse one day."

Source: Twitter, August 2021–November 2022. Tweets edited for clarity.

WHO ARE THE METAVERSE'S EARLY ADOPTERS?

We analyzed our consumer demographics to better understand the early adopters/metaverse-experienced, where they are located, and their key characteristics.

Our survey shows that a higher proportion of consumers from Canada, South Korea, and Japan are metaverse-experienced, while consumers from Spain, the UK, and the Netherlands show a lower adoption rate.
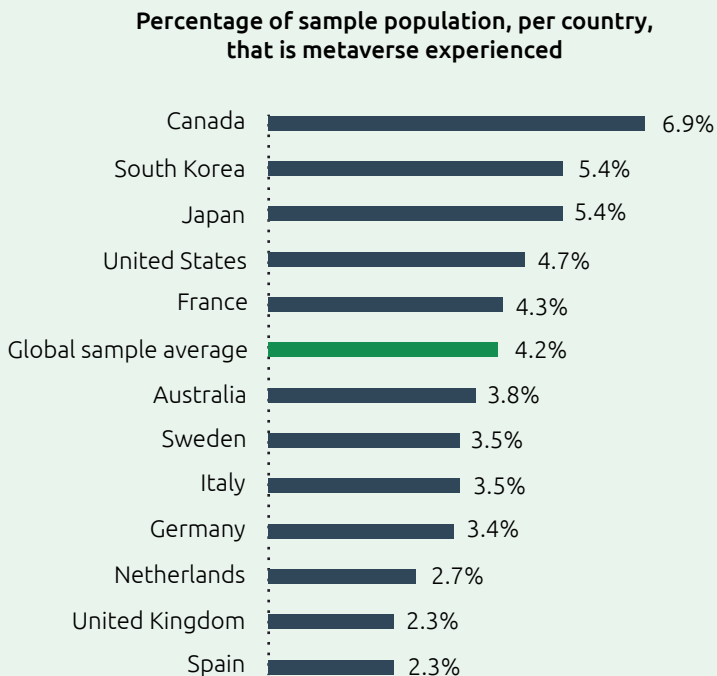
Fig.14

Canada, South Korea, and Japan have the highest number of metaverse-experienced consumers

Percentage of sample population, per country, that is metaverse experienced

Country	%
Canada	6.9%
South Korea	5.4%
Japan	5.4%
United States	4.7%
France	4.3%
Global sample average	4.2%
Australia	3.8%
Sweden	3.5%
Italy	3.5%
Germany	3.4%
Netherlands	2.7%
United Kingdom	2.3%
Spain	2.3%

Source: Capgemini Research Institute, Immersive technology – consumer survey, July–August 2022, n=335 metaverse-experienced consumers.

Fig.15

Gen Z and Millennials are early adopters compared to older generations

Percentage of sample population, grouped by generation, that is metaverse experienced
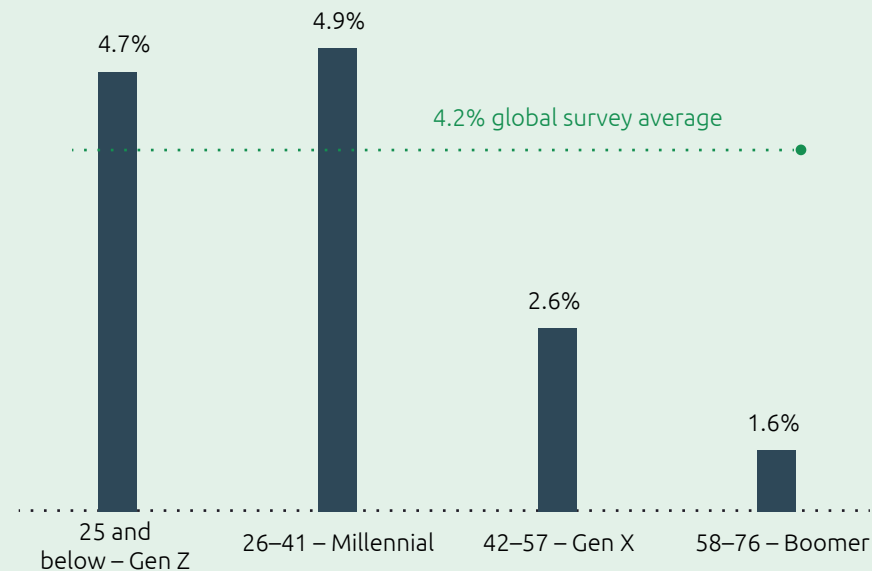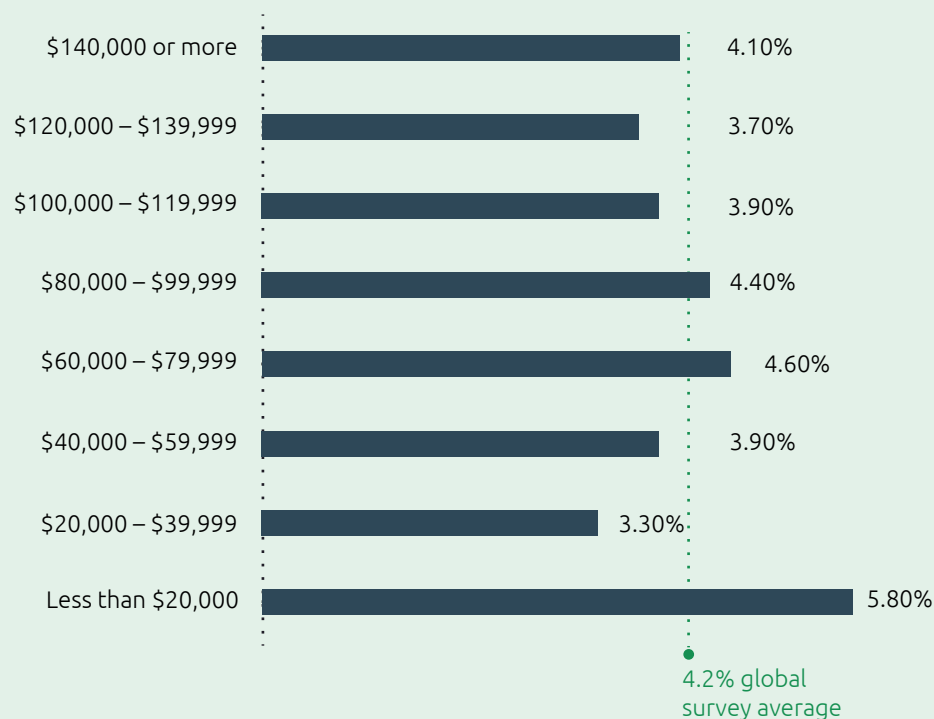

4.7%

4.9%

4.2% global survey average

2.6%

1.6%

25 and below – Gen Z

26–41 – Millennial

42–57 – Gen X

58–76 – Boomer

Source: Capgemini Research Institute, Immersive technology – consumer survey, July–August 2022, n=335 metaverse-experienced consumers.

Our survey shows us that, on average, the lowest annual income bracket (< $20,000) has the highest adoption rate. This metaverse-experienced group also comprises students and Gen Z. This shows that ownership of expensive AR/VR headsets need not be a stumbling block to experiencing the metaverse – although it might considerably enhance the experience. Mobile/PC applications, along with AR/VR gaming parlors, have enabled younger generations to experience the metaverse without actually requiring upfront investment in hardware.

Full-time students and self-employed professionals are most eager to experience the metaverse, while all other categories hover around the average, with the exception of retired consumers. One inference we could draw is that the early adopters of the metaverse are gamers who are more familiar with virtual environments and have time on their hands.

Percentage of sample population, grouped by income (PPP corrected), that is metaverse experienced

Income bracket	Percentage
$140,000 or more	4.10%
$120,000 – $139,999	3.70%
$100,000 – $119,999	3.90%
$80,000 – $99,999	4.40%
$60,000 – $79,999	4.60%
$40,000 – $59,999	3.90%
$20,000 – $39,999	3.30%
Less than $20,000	5.80%

4.2% global survey average

Source:Capgemini Research Institute, Immersive technology – consumer survey, July–August 2022, n=335 metaverse-experienced consumers.

Fig.16

The metaverse has significant early adopters among the middle-income brackets

Consumer interest in the metaverse focuses on social interaction and commerce

Metaverse-curious consumers see it primarily as a platform for virtual social interaction. Consumers are most interested in interacting with friends and family (43%), followed by work colleagues (39%). However, even this notionally social interaction could have a strong commercial aspect, as it could make the metaverse a hotbed of influencing and word-of-mouth recommendations. Another interesting use case is

gamification. A good example is Wendy's, the US fast-food restaurant chain, which is targeting gamers. In partnership with gaming platform Fortnite, which has a game mode called "Food Fight," Wendy's entered the game as a mascot character that smashed freezers to highlight Wendy's positioning as a user of "fresh, never frozen" meat. Tens of thousands of gamers joined the same mission, destroying burger freezers. This snippet of Wendy's destroying in-game

Fig.17

freezers amassed more than 1.5 million minutes watched. It was live-streamed and was viewed more than 250,000 times on Twitch. Subsequently, mentions of Wendy's on social platforms increased by 119%.[41]

Beyond social and entertainment features, consumers are also interested in commerce and brand interaction (see Figure 17). More than a quarter of consumers have expressed interest in experiencing/trying and possibly purchasing products and services via the metaverse. Interestingly, only 18% expressed interest in purchasing NFTs.

The metaverse has potential to influence the spending habits of the Gen Z and under-21 age groups. As per Roblox Corporation, their under-13 demographic has grown by 13%, while the over-13 demographic grew by 30%, year on year, for Q2 2022.[42] Metaverse could become the platform of choice for social and brand interaction for these demographics.

1.5 million

minutes watched of Wendy's "Food Fight" in Fortnite promoting their message of "fresh, never frozen" meat

Commerce and brand experiences rank next to the social aspects that consumers are interested in

Percentage of metaverse-curious consumers (93% of sample) and the features they are interested in

Feature	Percentage
Interacting with friends and family	43%
Interacting with work colleagues	39%
Gamification	33%
Metaverse commerce and purchasing	28%
Trying and experiencing products and services	27%
Exploring new ideas, concepts, people, and art	25%
Purchasing virtual real estate	22%
Visiting/exploring virtual concerts and shows	20%
Purchasing NFTs	18%

Source: Capgemini Research Institute, Immersive technology – consumer survey, July–August 2022, n=7,426 metaverse-curious consumers.

Retail and manufacturing can use the metaverse to align their offerings with consumers' interests

Our survey shows that consumers have a strong preference for particular metaverse sectors, in particular retail and product organizations. This closely follows the overall trend for immersive technologies (see Figure 6).
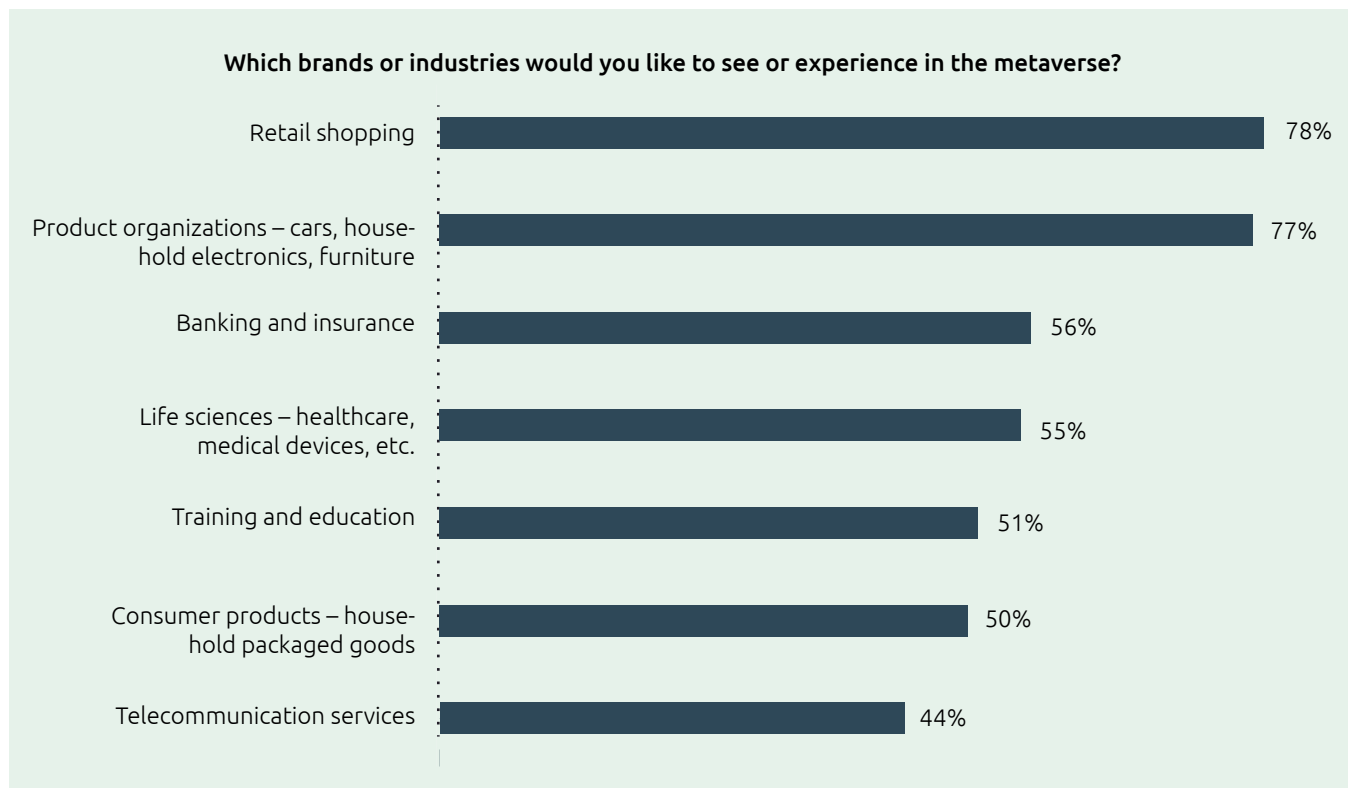
Consumers would like to experience products and services that enable them to make better purchase decisions. The metaverse also enables consumers to express their identities and opinions to their peers. Nike is tapping into the metaverse through its Roblox virtual world, Nikeland, which is modelled on its physical headquarters in Oregon, US and allows users to dress their avatars in Nike products. It also has a gamification angle: users with accelerometers in their mobiles can use their real-world movements to power their virtual movements.[43] As John Donahoe, CEO of Nike, explains in the organization's earnings call in March 2022:

"Since its launch, a total of 6.7 million players from 224 countries have visited Nikeland on Roblox and we plan to continue driving energy there with virtual products, such as LeBron 19 styles, which are exclusive to Roblox."[44]

Fig.18

Retail shopping and product organizations attract the highest interest from consumers

More than three quarters of consumers showed interest in seeing or experiencing brands from retail shopping and product organizations (78% and 77%, respectively – see Figure 18). So, these industries must act faster to capture consumer interest. Enthusiasm is still significant for most other sectors, with half of consumers showing interest in financial services and life sciences. In the former, organizations can use immersive experiences to explain financial products or handle claims. Similarly, beyond training surgeons and nurses in various medical procedures, life insurance companies can educate consumers on the efficacy and side-effects of different drugs.

Which brands or industries would you like to see or experience in the metaverse?

Industry	Percentage
Retail shopping	78%
Product organizations – cars, household electronics, furniture	77%
Banking and insurance	56%
Life sciences – healthcare, medical devices, etc.	55%
Training and education	51%
Consumer products – household packaged goods	50%
Telecommunication services	44%

Source: Capgemini Research Institute, Immersive technology – consumer survey, July–August 2022, n=8,000 consumers.

"If the metaverse succeeds – and the numbers lead us to believe it will – we can have a head start as first movers."

Hélène LABAUME

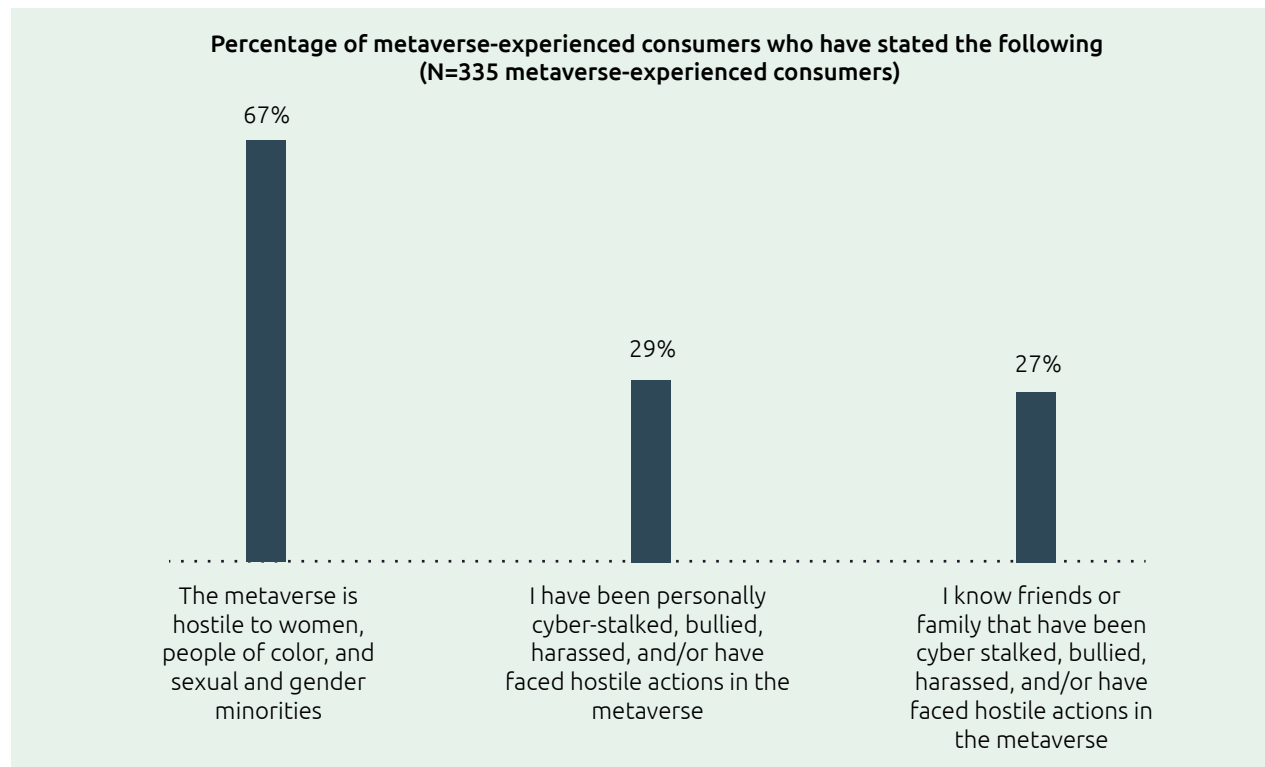Director of innovation, Carrefour

The metaverse amplifies consumer concerns around social media

While most consumers are curious about the metaverse, many also harbor considerable concerns, similar to those that have arisen around "traditional" social media. As immersive experiences become more realistic, and the physical environment more intimate, any negative impact on a user can be more greatly amplified more than in traditional text- and web-based environments. A hostile environment on social media, for example, could result in abusive messages, posts, or tweets. However, in the metaverse, this threat can be more personal and physical – a groping problem has already been reported, for example.[45] All this could lead to a harmful experience for users and negative associations with brands as a consequence.

Our limited sample of metaverse-experienced consumers suggests that consumers perceive the metaverse to be a hostile environment. Among these consumers, two in three stated that it was hostile to women, people of color, and sexual and gender minorities. Further, three in ten (29%) users mentioned that they had personally been cyber-stalked, bullied, harassed, and/or faced hostile actions in the metaverse, while one in four mentioned they knew friends and family who had undergone such experiences. According to Pew Research, one in four US consumers experience online harassment (physical threats, sexual harassment, stalking, and sustained harassment).[46]

29%

three in ten (29%) users mentioned that they had personally been cyber-stalked, bullied, harassed, and/or faced hostile actions in the metaverse

Fig.19

Metaverse-experienced consumers have faced hostile environments and experiences

We also analyzed over 180,000 conversations on social media about the metaverse; Figure 20 presents a word cloud from this analysis illustrating the primacy of consumer concerns about sexual harassment, safety, and privacy issues. The key outcomes from our social scan of the metaverse were the following:

• Among women users, there is a concern that they might be sexually harassed in the metaverse
• Mental-health concerns, especially the fear of metaverse addiction and isolation from the real world, are common talking points
• Individuals are also talking about interoperability between different metaverse platforms, as well as integration between the virtual and real worlds

Percentage of metaverse-experienced consumers who have stated the following (N=335 metaverse-experienced consumers)

| | 67% | 29% | 27% |

The metaverse is hostile to women, people of color, and sexual and gender minorities

I have been personally cyber-stalked, bullied, harassed, and/or have faced hostile actions in the metaverse

I know friends or family that have been cyber stalked, bullied, harassed, and/or have faced hostile actions in the metaverse

Source: Capgemini Research Institute, Immersive technology – consumer survey, July–August 2022, n=335 metaverse-experienced consumers.

Fig.20

Social media conversation about the metaverse highlights consumers' concerns

Source: Capgemini, social listening study, conducted in August – September 2022 for the period August 2021 – July 2022.

Most of the technology and user-interface challenges with the metaverse are teething issues common to current and emerging platforms or services. However, the ethical and safety issues are noteworthy and call for action from all metaverse players to avoid the kind of negative brand association that could render the medium ineffective as a consumer interface. The top-most concerns among consumers are data collection (76%) and control of personal assets (72%), followed by traditional concerns about social media (60%).

Fig.21

Metaverse challenges include a lack of control over personal assets

Percentage of consumers who state the following challenges in their use of the metaverse

Challenge	Percentage
There is far too much personal information being collected	76%
There is a lack of control over personal assets (avatars, digital personas) and data	72%
There are considerable concerns about the use of social media, which would prevent me from using the metaverse	60%
Like social media, immersive experiences have the possibility of creating "echo chambers" and polarizing populations	56%
I do not want to invest in and get locked into a certain ecosystem	51%
I do not want to experience any more advertisements or promotions	41%
I would not be willing to allow children to use the metaverse	38%

Source: Capgemini Research Institute, immersive technology – consumer survey, July–August 2022, n=8,000 consumers.

Most of the technology and user-interface challenges of the metaverse will be addressed as the technology matures. However, the safety and ethical threats could impede the development of a safe community environment for the metaverse, which would be a prerequisite for the participation of the majority of brands. Moderating these spaces will need to balance interactivity with privacy and security issues, all of which needs to be addressed by brands at the design stage.
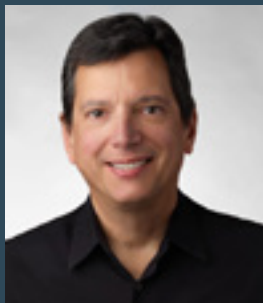
Thoughts on the metaverse

Our conversation with Richard Kerris, Vice President, Omniverse Development Platform at NVIDIA

What is your view of the metaverse?

At NVIDIA, we see the metaverse as the next generation of the internet, which will be 3D. In the way that people can go from website to website today, they'll be able to seamlessly transport between virtual worlds — exploring, interacting, and even teleporting between the physical and the digital.

Many companies are opting for their own virtual worlds in the metaverse. Is there still a need for interoperability among these virtual worlds?

Yes, interoperability is needed to preserve consumer convenience, just as it's needed between websites today. Setting specific requirements for each world would become a barrier to adoption.

What is the biggest challenge that organizations face with the metaverse applications?

A major challenge for organizations with customers moving to a 3D environment is understanding the power that's now at their disposal. There was a similar learning curve when companies were first being transformed by the internet. As organizations now have 3D virtual worlds within reach, the biggest hurdle they face is likely understanding all the new capabilities to which they have access.

Which part of the organization will drive this metaverse adoption?

We're seeing a large set of enterprise customers now designating a Chief Metaverse Officer. This is happening at major studios, design houses, and marketing firms. This role constitutes understanding how metaverse technologies can affect the different parts of the business, as well as the depth and breadth of various use cases.

What is the potential of the metaverse?

The internet is far more impactful than the world first dreamed it could be, and we believe the metaverse will be, too. It's anticipated to be a multi-trillion-dollar opportunity.

Will the metaverse be open or will it be a 'walled garden'?

Like the internet, the metaverse must be open. There will be major players, similar to Google and Salesforce, which have become almost synonymous with what the web stands for in their particular line of business. We expect to see similar patterns in the metaverse with major virtual worlds for industry and entertainment experiences.

Fig.22

Organizations expect the metaverse to be an important channel for consumer and for employee experience as well

Outside the consumer experience, organizations are taking a watch-and-wait approach to the metaverse

Many organizations (72%) we surveyed only started looking into the metaverse after Facebook's rebranding to Meta in October 2021. We found that two in three organizations believe the metaverse is going to change the way people interact with brands in the long term, as seen in Figure 22.

Brands need to define a purpose for their presence in the metaverse, design and develop their individual experiences, and bring in consumers to engage in this new world. They also need to develop the skills to animate and manage such a universe.
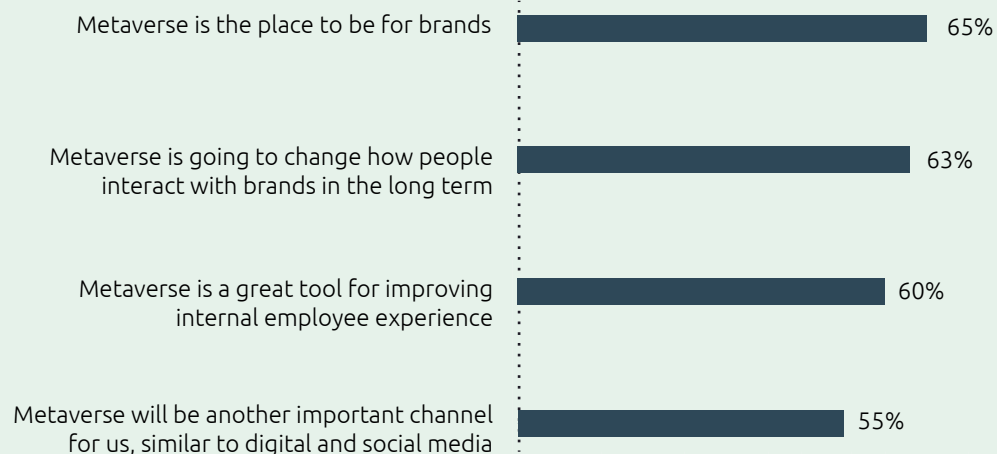
Metaverse is the place to be for brands — 65%

Metaverse is going to change how people interact with brands in the long term — 63%

Metaverse is a great tool for improving internal employee experience — 60%

Metaverse will be another important channel for us, similar to digital and social media — 55%

Source: Capgemini Research Institute, Immersive technology – executive survey, July–August 2022, n=1,000 organizations.

Fig.23

Marketing and advertising, followed by recruitment, are the top use cases

However, with consumers being curious but also wary about fully immersing themselves, organizations are taking a cautious approach to their entry into the metaverse. In our survey, 8% of organizations mentioned that they already had some sort of metaverse presence, while another 15% plan to have one within a year. Nearly half (45%) believe that the metaverse will become mainstream within three years.

Further, with the metaverse market expected to be worth more than $500 million by 2030,[47] organizations are planning to increase spending on the metaverse. In our research, organizations stated that, three years from now, the metaverse could account for nearly 10% of their marketing and advertising budget. This would mean tens of billions of dollars in metaverse spending in the US alone, where organizations have spent nearly $300 bn on media advertising in 2022 to date. [48] We probed organizations on their preferred applications for the metaverse. Virtual events for demonstrating new products/features are the most popular planned use case (73%), followed by recruitment, which is preferred by 60% of organizations (see Figure 23).
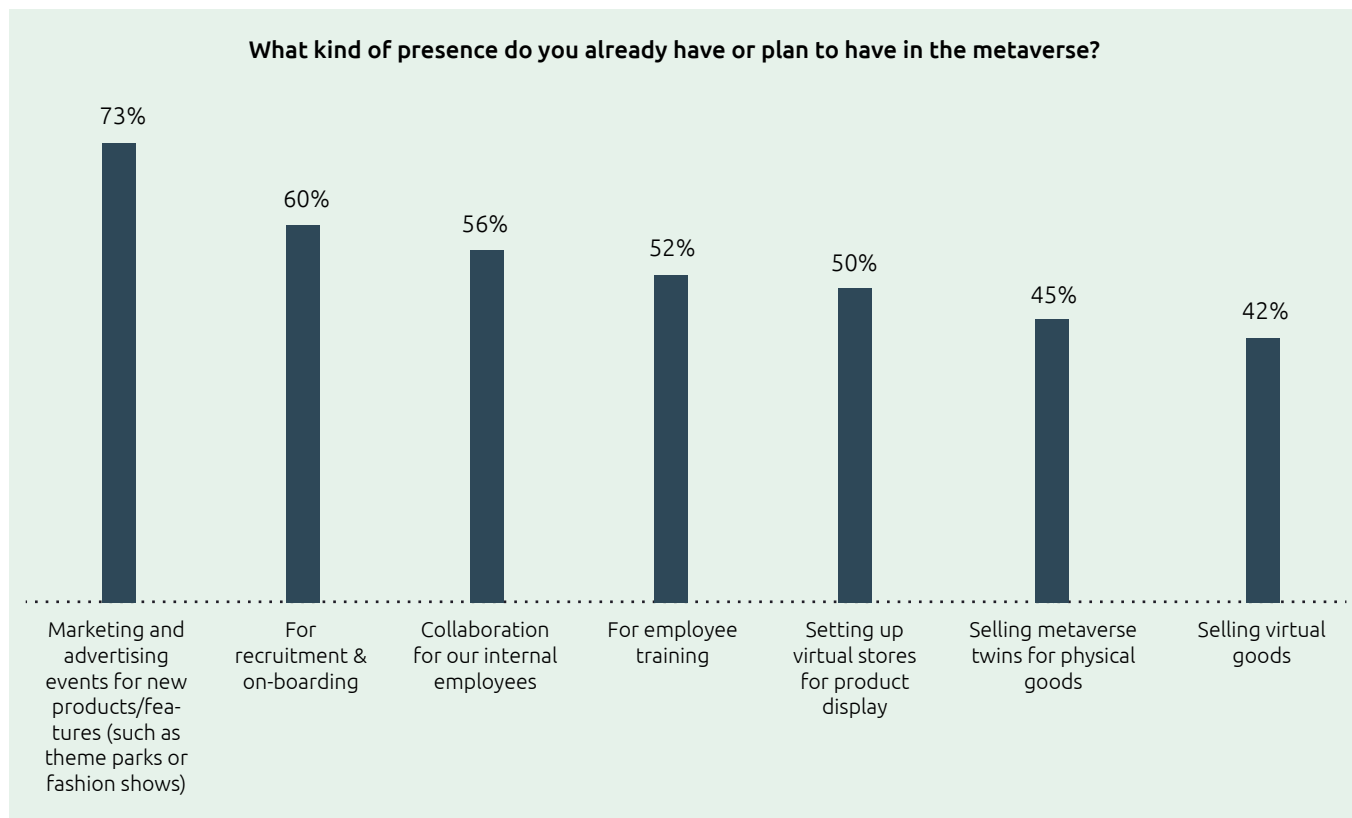
What kind of presence do you already have or plan to have in the metaverse?

Use case	Percentage
Marketing and advertising events for new products/features (such as theme parks or fashion shows)	73%
For recruitment & on-boarding	60%
Collaboration for our internal employees	56%
For employee training	52%
Setting up virtual stores for product display	50%
Selling metaverse twins for physical goods	45%
Selling virtual goods	42%

Source: Capgemini Research Institute, immersive technology – executive survey, July–August 2022, n=452 organizations.

Capgemini Research Institute 2022

The metaverse could take event marketing to a whole new level, wherein customers can interact virtually with hosts and peers, rather than just chatting or watching on screens. These virtual spaces could also be excellent venues for immersive and interactive advertising. The majority of organizations also see a metaverse presence as essential to competing effectively in the new jobs market.

Nevertheless, many organizations we surveyed also expressed concern about investing in the metaverse. A large percentage (59%) say they are taking a "watch-and-wait" approach. Of the organizations not planning to have a metaverse presence, 52% believe investing now could be a

waste of resources. This may be explained by low metaverse adoption among paying consumers (Roblox and Fortnite users excepted). Both Decentraland (a 3D browser-based virtual world, where users can buy virtual land, among other transactions) and The Sandbox (a metaverse platform that allows players to create and monetize gaming experiences) saw low DAU of 38 and 522, respectively, in October 2022.[49] Even if we see these as isolated dips, DAU for each is under 1,000.[50] Further, organizations are concerned about whether the metaverse will be an open ecosystem or a "walled garden." We found in our research that the domination of the metaverse by a handful of players (such as Meta) would be a huge concern for 68% of organizations.

68%

of organizations are concerned that the metaverse would be dominated by a handful of players (such as Meta)

However, our research notes that, while the potential of the metaverse is still in question, various organizations regard it as a way to innovate and to differentiate themselves. This approach is driven by senior management. A good example is Kering, the French group that owns luxury brands Gucci, Saint Laurent, Bottega Veneta, and Balenciaga, among others. Their chairman, François-Henri Pinault, speculates:

"Will it happen? It's too early to say. We are very active. We'll see if it's justified later. It is more a philosophy of innovation in the group that makes us work in this way." He noted that it's already playing a role in the art world. *"Will it become a universe in a wider economic environment? I think it will happen. It will become both an opportunity and a disruptive phenomenon."*[51]

04

HOW CAN IMMERSIVE TECHNOLOGY REIMAGINE THE CUSTOMER JOURNEY AND INTERNAL OPERATIONS?

Fig.24

Delivering immersive experiences

While there are a variety of applications, both at the consumer end and in internal operations, large-scale immersive technologies implementations are limited, and metaverse applications are only now emerging. To complicate matters further, headset specifications are continuously evolving as technology infrastructure improves. To ensure long-term value to their organizations and customers, organizations should make a carefully and comprehensively planned entry, analyzing the most efficient use cases from both operational and human perspectives in order to maximize the effectiveness of their positioning.

In this section, we suggest the following focus areas for organizations to develop and harness these technologies (see Figure 24).

Leverage external agencies, partners, and end users to co-create and establish a presence

Identify and select use cases based on value delivered while maintaining consistency in brand presence

Enrich the community aspect in order to build customer retention

Delivering immersive experiences

Build a center of excellence to drive the immersive initiatives at scale

Strengthen digital assets and omni-channel integration

Design measures to promote consumer privacy and safety from the beginning

Source: Capgemini Research Institute analysis.

Identify and select use cases based on value delivered to consumers and employees while maintaining consistency in brand presence

Our survey shows that most use cases are scaled only to a limited degree. Unsurprisingly, 38% of organizations in our survey mentioned that immersive technology initiatives were considered one-off projects, rather than continuous implementation initiatives. Selecting the right use case to be deployed at scale is critical. Valentin Heun, VP of Innovation Engineering at PTC – the American industrial software developer, innovation engineering firm comments: *"You research your use cases that you find interesting and it's probably a matter not of feasibility but applicability; it just needs some momentum to put them into the right context."* Steve Dertien, EVP & Chief Technology Officer of PTC, further adds: *"The use case matters in the sense that it really comes down to how much value it's providing to the user. If you have a high-value use case, like a critical safety-training application or operations application, the more likelihood there is to use it."*

While prioritizing the identification of the correct use cases, organizations need to focus on the areas of application and the benefits for front-line employees and consumers, rather than force-fitting the technology to a problem. It is critical to understand key pain points and challenges for end users, and how immersive technologies can mitigate these concerns as well as enhance their experiences. An over-emphasis on technology as a strategy, rather than viewing it as an enabler, could lead to issues with large-scale deployment in such a fast-evolving market.

Most organizations focus on using these technologies and use cases to generate additional revenue, without considering outcomes for employees and consumers. This can be seen, for example, in the vast majority of NFT drops (or launches) that organizations deploy and the fizzling out of these at the expense of loyal consumers.

One of the interviewees we spoke to highlighted this: *"I always think about this FMCG brand, and another beverage brand, both of which did 10,000 item drops that made a little bit of money up front and then just died and went away without utility, without alignment, without anything."*

Immersive technologies and metaverse use cases should start by ensuring proper alignment with a business objective,

and benefits for employees and consumers. Only when there is consistency of brand messaging will it become easier for consumers to maintain their ongoing connection with the brands.

Immersive technologies require change management. For instance, use cases like remote support and augmented working require a significant change in work methods and shop-floor culture. Change management must highlight the benefits of the initiative and work towards overcoming employee resistance. At the same time, the use cases selected should be backed with sufficient investment and support.
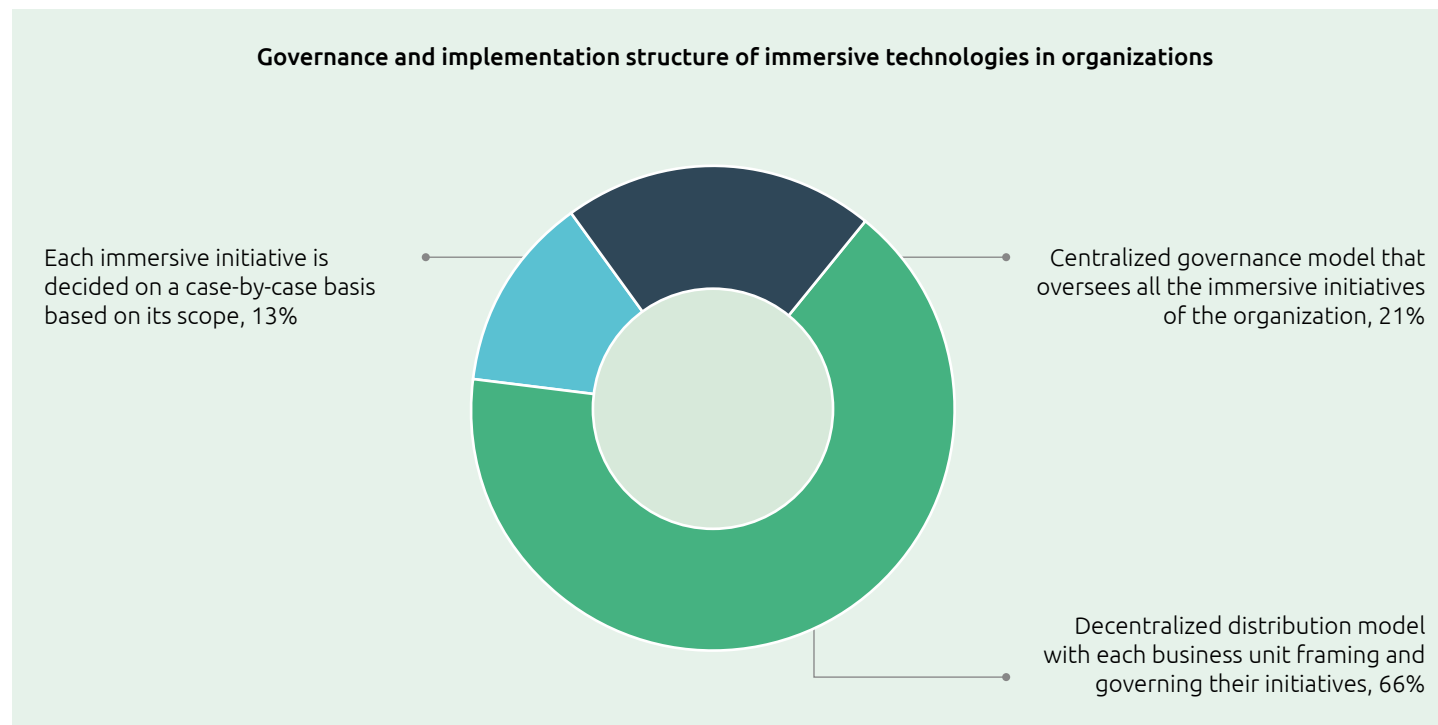
Build a center of excellence to drive the immersive initiatives at scale

A central team (an innovation hub or a center of excellence) could drive the scaling of initiatives. An aerospace executive describes the approach their firm has taken to the metaverse:

"A few months ago, we did not know what the metaverse was. So, our approach is very different than, say, technologies

Fig.25

Governance for immersive initiatives is largely decentralized

Governance and implementation structure of immersive technologies in organizations

Each immersive initiative is decided on a case-by-case basis based on its scope, 13%

Centralized governance model that oversees all the immersive initiatives of the organization, 21%

Decentralized distribution model with each business unit framing and governing their initiatives, 66%

Source: Capgemini Research Institute, Immersive technology – executive survey, July–August 2022, n=900 organizations with immersive initiatives.

where we have loads of use cases already implemented. We tried to understand legally what others are doing, and what patents they're claiming for. And then we've scouted globally on the metaverse, and we have tried to collect inputs and reports from all immersive technology teams internally. So, we are trying to understand today what metaverse in aerospace is, and what it will bring to us once we implement it. After this, we are going to choose a strategy."

Our survey shows that only one in five (21%) organizations have taken this centralized approach. The vast majority (two-thirds) have a decentralized, distributed model. Further amplifying these challenges, our survey showed that 62% of organizations show a lack of management commitment to immersive initiatives, and 56% state their organization lacks a clear roadmap to adoption. More than half (55%) also state there is a lack of cross-functional collaboration.

A central team not only helps in scaling but also in educating the rest of the organization (for example, marketing, HR, and operations) about the potential of new technologies. For example, with the metaverse, this central body will also need to cover allied trends and

technologies – social commerce, NFTs, gamification, digital twins, etc. This requires an understanding of these complex technologies and the opportunities they present, along with their likely impact on existing functions. NFTs, for example, require new forms of accounting, an understanding of legal complications, and close attention to product design pre-launch. Similarly, AR/VR applications require collaboration with product/service design teams, along with efforts towards monetization.

Organizations have recruited talent from the gaming industry to bridge gaps in internal competencies. However, what is lacking is a cross-functional culture and internal marketing expertise that can position services for specific targets. A similar challenge lies in building the required data competencies.

The central body should be the backbone of immersive-technology implementation. However, these initiatives should be designed around product- and demand-led decisions, rather than over-centralized strategy. Key roles include:

- Identifying and prioritizing use cases, together with a roadmap

- Selecting the technology and vendor platforms for specific use cases
- Defining the KPIs for success and establishing the baseline for these metrics
- Establishing a budget and accounting for immersive technologies and the metaverse
- Enabling the scaling and adoption of use cases and specific technology
- Establishing a center of excellence, ethical framework, and technical competencies within the organization
- Supporting individual business units

Design measures to promote consumer privacy and safety from the beginning

Our research confirms that ethical and privacy concerns are significant among consumers. Brands that become associated with less-than-acceptable content in other channels (including news and social media) have felt a

backlash, including calls for boycotting. Organizations should take the following steps, right from the design phase, to ensure a positive experience for consumers:

- Select platforms and technologies with strong content and equally strong moderation
- Create a strong ethical framework for your organization and use it to create guidelines for selecting platforms and technologies
- Ensure associated platforms adhere to brand values and standards
- Build portals and channels to address consumer grievances
- Establish dedicated teams for quick action, response, and resolution

Ultimately, any platform that organizations choose to use/ partner with should support the values of the brand. This is best described by a consumer product executive working in the space: *"I think the most important thing is a clear understanding of your brand strategy, which says: this is who we are; this is who we want to connect with; this is what we want them to do; and this is how we go about telling them why they should do it with us."*

Strengthen digital assets and omni-channel integration

To deliver immersive experiences at scale, organizations should start investing in the necessary digital assets: the hardware infrastructure required for the creation and delivery of these experiences. This could mean building and storing 3D models, adapting them for different platforms, and building integrations around these experiences. For instance, if the organization wants to showcase a particular product in 3D, it will first need a digital representation of the product with all possible configurations. Once it has a library of such products, these can be easily ported onto a web-based AR or a platform such as Unity or Unreal Engine.

Omni-channel integration ensures that the experience is smooth across different channels. Say a consumer goes to the website and finds a product they are interested in. They can then proceed to the organizations' virtual world in the metaverse and interact with the product. The consumer can choose to purchase the product online and have it delivered to their home address. This involves integration across the various consumer touchpoints, order management, and inventory-management systems. Without seamless integration across these various channels, the experience will be disjointed for the customer.

Enrich the community aspect in order to build customer retention

While the novelty of the immersive experience will attract consumers, the greater challenge is retention. The answer, partly, lies in building a strong community aspect to your experiences and content. The virtual Nikeland world on Roblox had received more than 21 million visitors as of September 2022. Nike is able to maintain interest through the introduction of new items. Further, during NBA All-Star Week, the company commissioned US basketball star LeBron James to visit Nikeland, around which they built competitions and events.[52] Vans, the California sportswear brand known for its skateboarding shoes, replicated a real-world Californian skate park in the metaverse, allowing its consumers to virtually practice skateboarding skills with friends.[53] These kinds of experiences and social interaction boost retention.

Leverage external agencies, partners, and end users to co-create and establish a presence

Immersive technologies are a dynamic market with immense opportunities; however, organizations and brands may not have the internal capabilities to take advantage of these opportunities. Building competencies while committing to a certain platform and use case requires time, which, in an evolving market, could result in opportunity loss.

Brands and organizations should, therefore, harness external capabilities and partners to deploy and test potential quickly. External technology firms are best positioned to fill the expertise gap, allowing the organization to focus on use-case selection and designing a roadmap. These external agencies will have considerably more experience in the design and deployment of immersive use cases.

The metaverse also allows consumers to co-create and build upon the brands and platforms of organizations.

This is currently untapped potential; consumers and end users could be given access to an organization's assets to co-create without legal jeopardy. This would foster a sense of community around the brand, building consumer loyalty. This co-creation would also ensure that brand values are supported and adhered to; hence, content moderation is an essential part of this. Organizations can also choose to partner with peers to create engaging experiences for the audience. Hélène LABAUME from Carrefour shares an example: *"We co-created with P&G a metaverse experience with their product, Mr. Clean. The goal was to create a first bridge between metaverse and e-commerce. P&G had a metaverse house dedicated to this product, that people can enter [to] as an avatar and see how the product works. Next to the product, visitors could click on a Carrefour bubble in order to purchase the product on Carrefour e-commerce . We also had a solo gaming experience where people had to clean as fast as they can in order to win points and vouchers from Carrefour to spend on our e-commerce."*

CONCLUSION

Our research has shown that consumers are excited about immersive experiences. Around half of consumers see immersive experiences as a positive influence on their product-buying cycle. Immersive experiences will help organizations to differentiate their customer experience and strengthen connections with consumers. Further, organizations are benefiting from these technologies in terms of improved internal operations and better employee experiences. While AR/VR technologies have been in use for several years in certain industries, immersive applications on web/ mobile have also gained adoption in recent years.

Further, with the heightened interest and developments in the metaverse space, organizations have a plethora of opportunities open to them. A large proportion of consumers are curious about the metaverse and want to engage with it, once it becomes accessible to them. A few organizations have already

built or begun building virtual worlds. While virtual worlds and the industrial metaverse are already accessible today, it will take years for the metaverse concept to be fully realized.

On the consumer front, concerns around metaverse adoption remain; organizations must respond. On the industrial front, while organizations are able to deploy these technologies across operations, scaling challenges do remain. Organizations need to drive these initiatives through a central team and provide the requisite support to business units. At the same time, consumer concerns about privacy and the safety of the metaverse are sufficiently significant to require organizations to pay particular attention to resolving these issues. This is critical to assuaging legitimate concerns and to ensuring the metaverse is the safe, welcoming virtual environment it is being positioned to be.
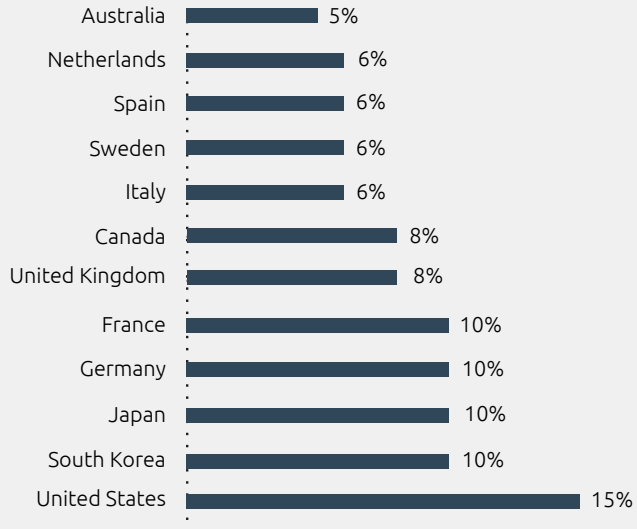
RESEARCH METHODOLOGY

To understand consumer interest in immersive experiences and the metaverse alongside the organizational perspective, we conducted extensive consumer and industry research.

The study findings reflect the views of the people who responded to our online questionnaire for this research and are aimed at providing directional guidance.
Please refer to the methodology for details about the respondents or contact a Capgemini expert to understand specific implications.
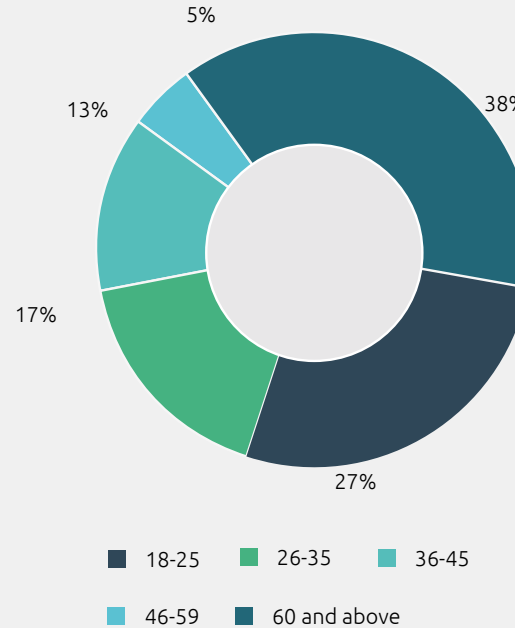
1. Consumer survey

We surveyed 8,000 consumers over the age of 18 in 12 countries across Asia Pacific, Europe, and North America. The survey took place in July and August 2022. The demographic details of consumers are given below:

Consumers by country of primary residence

Country	%
Australia	5%
Netherlands	6%
Spain	6%
Sweden	6%
Italy	6%
Canada	8%
United Kingdom	8%
France	10%
Germany	10%
Japan	10%
South Korea	10%
United States	15%

Consumers by age

- 18-25
- 26-35
- 36-45
- 46-59
- 60 and above

38% / 27% / 17% / 13% / 5%

Consumers by self-identified gender
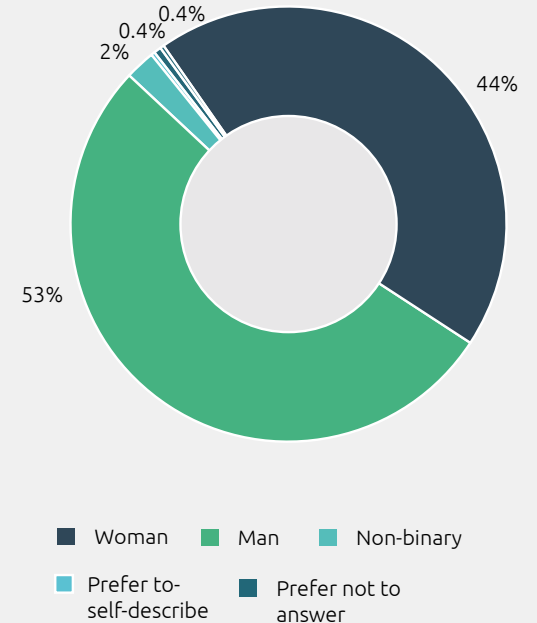
- Woman — 44%
- Man — 53%
- Non-binary — 2%
- Prefer to-self-describe — 0.4%
- Prefer not to answer — 0.4%

Source: Capgemini Research Institute, immersive technology – consumer survey, July–August 2022, n=8,000 consumers.

Source: Capgemini Research Institute, immersive technology – consumer survey, July–August 2022, n=8,000 consumers.

Source: Capgemini Research Institute, immersive technology – consumer survey, July–August 2022, n=8,000 consumers.

Consumers by work status
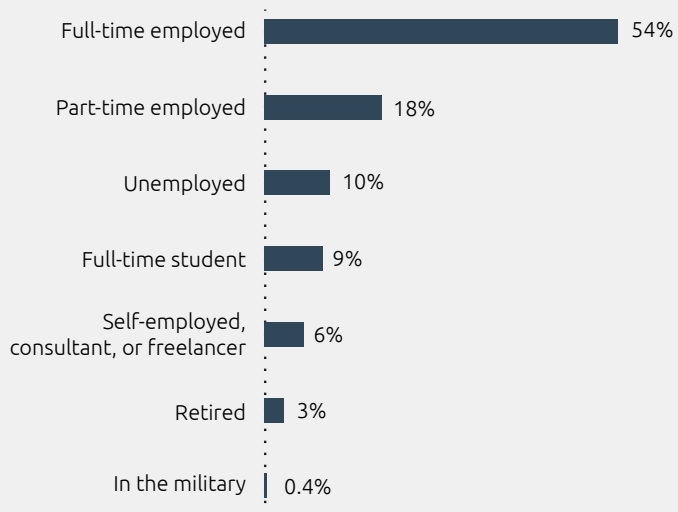
Full-time employed	54%
Part-time employed	18%
Unemployed	10%
Full-time student	9%
Self-employed, consultant, or freelancer	6%
Retired	3%
In the military	0.4%

Consumers by annual household income
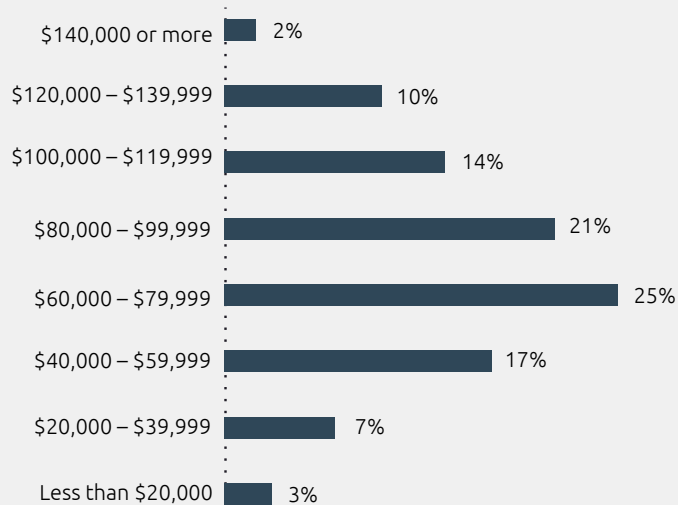
$140,000 or more	2%
$120,000 – $139,999	10%
$100,000 – $119,999	14%
$80,000 – $99,999	21%
$60,000 – $79,999	25%
$40,000 – $59,999	17%
$20,000 – $39,999	7%
Less than $20,000	3%

Source: Capgemini Research Institute, immersive technology – consumer survey, July–August 2022, n=8,000 consumers.

Source: Capgemini Research Institute, immersive technology – consumer survey, July–August 2022, n=8,000 consumers.

2. Executive survey

We surveyed executives from 1,000 organizations across eight sectors. All these organizations generate more than $1 billion in annual revenue; 80% of these organizations have an ongoing immersive experience initiative. The global survey took place in August and September 2022. The distribution of these organizations is given below:

Organizations by headquarters

Country	%
Australia	5%
Italy	6%
Spain	6%
Sweden	6%
Netherlands	6%
Canada	8%
United Kingdom	8%
France	10%
Germany	10%
Japan	10%
South Korea	10%
United States	15%

Organizations by revenue

- 35% — Between 1 and 5 billion USD
- 29% — More than 5 bn to 10 billion USD
- 18% — More than 10 bn to 20 billion USD
- 11% — More than 20 bn to 50 billion USD
- 8% — More than 50 billion USD

Source: Capgemini Research Institute, immersive technology – executive survey, July–August 2022, n=1,000 organizations.
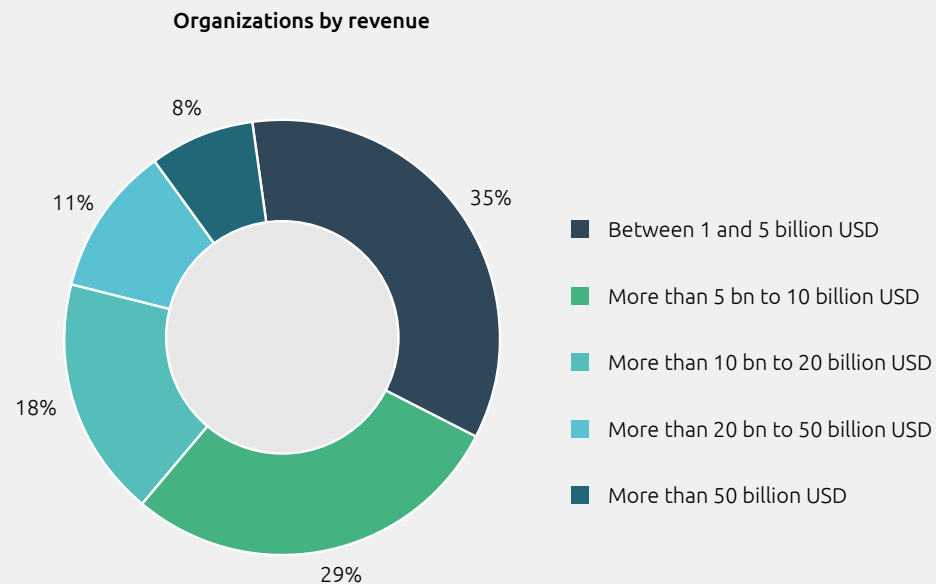
Source: Capgemini Research Institute, immersive technology – executive survey, July–August 2022, n=1,000 organizations.

Organizations by sector

Discrete manufacturing	30%
Consumer products	15%
Banking	10%
Telecom	10%
Life sciences	10%
Media and content	10%
Retail	10%
Insurance	5%
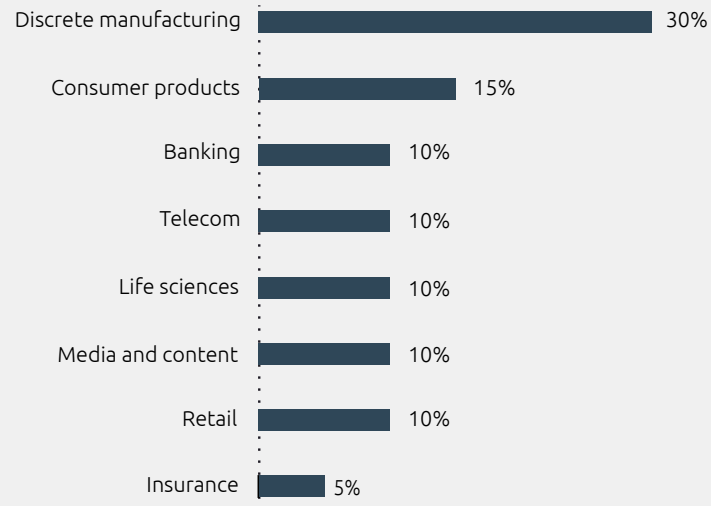
Discrete manufacturing organizations by sub-sector
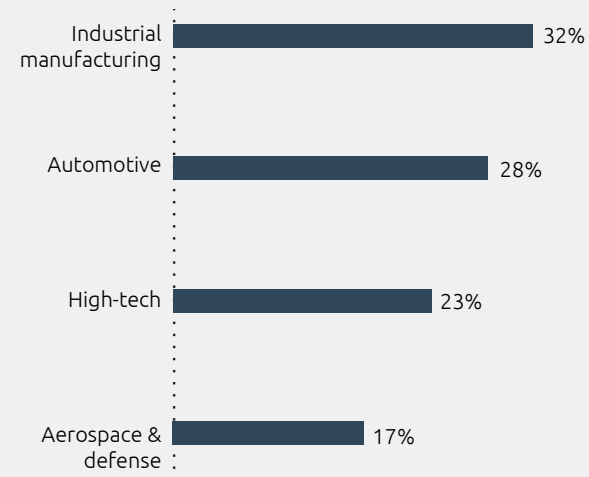
Industrial manufacturing	32%
Automotive	28%
High-tech	23%
Aerospace & defense	17%

Source: Capgemini Research Institute, immersive technology – executive survey, July–August 2022, n=1,000 organizations.

Source: Capgemini Research Institute, immersive technology – executive survey, July–August 2022, n=1,000 organizations.

Status of immersive experience initiatives (targeted sample)

10% 10%

80%

We have plans to implement an initiative for an immersive experience within the next 12 months

We have an ongoing immersive experience initiative

We have an ongoing immersive experience initiative
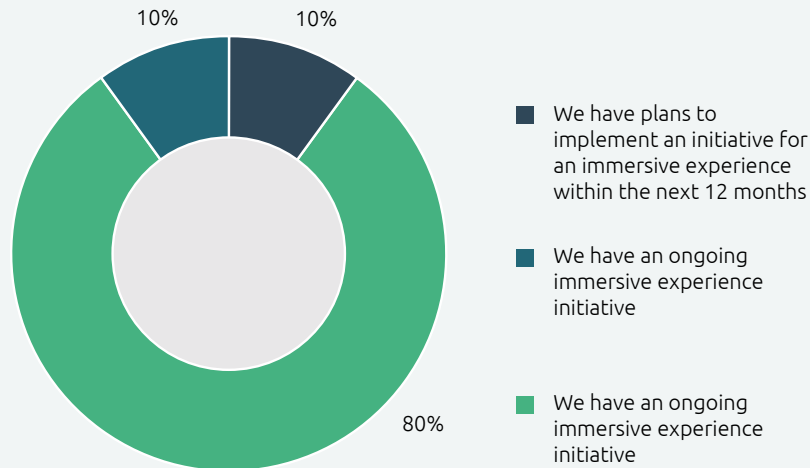
3. Social listening

Social listening analysis on metaverse was conducted in August–September 2022 in three parts: Google Search analytics, social media analytics, sentiment analysis and emotion detection.

– Google Search analytics using Google Keyword Planner data
A total search volume of 135 million was analyzed for the time period June 2021 to July 2022

– Social-media analytics
Talkwalker, a consumer intelligence platform, was used to conduct social-media analytics on Twitter, Reddit, and YouTube: 180k conversations during timeline: August 2021–July 2022 were analyzed

– Sentiment analysis and emotion detection:
Sentiment analysis was conducted based on results from Talkwalker, which uses machine learning to classify sentiments into positive, negative, or neutral (90% claimed accuracy) in 92 languages (timeline: August 2021–July 2022)

4. In-depth interviews

We conducted ten interviews with experts from large organizations that are already implementing immersive experience and metaverse initiatives. We also spoke to several technology firms delivering these solutions.

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Reimagining the customer journey and employee experience

IMMERSIVE EXPERIENCES

Immersive technologies have the potential to radically transform how customers and employees interact with brands, products, and systems. Ordinary digital engagement is not enough. Recent technological advances are pushing the user experience to new heights.

So, when brands creatively design experiences that use a combination of modalities (flat UI, natural interfaces, and XR), they can create multi-sensory customer experiences at various touchpoints that are not only personalized but also go above and beyond in terms of convenience and sensory appeal. They drive loyalty and advocacy.

But these experiences need to continually adapt and evolve. Capgemini's CX team supports clients to help them meet customer and employee expectations and outperform competitors. We strategize, design, build and execute immersive experiences that are contextually relevant, multi-sensory, and emotionally engaging. We help drive business growth for our clients by disrupting the ordinary – helping create extraordinary experiences that build memorable and emotional connections.

CAPGEMINI'S METAVERSE-LAB

Capgemini believes that the metaverse will offer opportunities for a more connected and emotional experience for consumers (CX), for reinventing the employee experience (EX) and for optimizing R&D, engineering, manufacturing, operations and supply chains (Industrial Metaverse)

Capgemini set up its Metaverse-Lab, a coordinating hub for research and solutions, designed to help our clients explore the possibilities of the emerging technologies, and shape and execute their metaverse strategies. Our team comprises senior technology experts from across the Group with a strong track record in the key underlying technologies of the Web3 / metaverse and the development of disruptive actionable solutions.

Our R&D programs cover the future of immersive human-machine interfaces and controllers, work in the metaverse, digital twins, blockchain, Web3 and decentralized approaches.

OUR IMMERSIVE EXPERIENCE AND METAVERSE SERVICES

- **Immersive Customer Experience (CX):** We create extraordinary experiences that build memorable and emotional connections at each stage in the customer journey across devices and channels
- **Immersive Employee Experience (EX):** We enable your hybrid workforce by simulating physical world training and collaboration in the virtual world. This increases employee engagement while decreasing costs.
- **Industrial Metaverse:** We help business realize the value of digital twins faster, driving profitable growth and sustainability through data-driven performance
- **Metaverse Experiences:** We help our clients imagine the opportunities, plan for, and create metaverse experience across CX, EX, and enterprise use cases, including technology infrastructure strategy and implementation.

We bring together our CX, EX, technology, domain and consulting talents to develop bespoke Metaverse and Immersive Experiences solutions from research through to implementation and at-scale delivery, using next generation technologies.

For more information, please visit:
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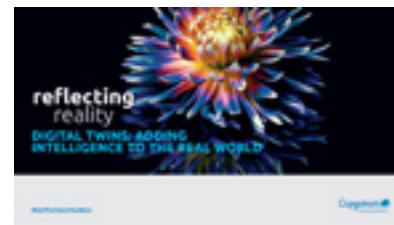# DISCOVER MORE ABOUT OUR RESEARCH
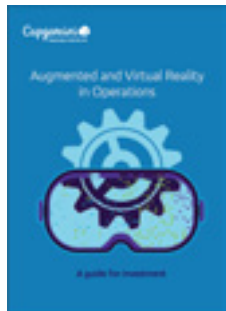
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