

vsp VISION PRESENTS:

EYE ON THE METAVERSE

How the Metaverse Will Impact
the Vision Care Journey

VSP GLOBAL INNOVATION CENTER

 **CBINSIGHTS**

Eye on the metaverse

The VSP Global Innovation Center and CB Insights Futurist Report series highlights the ideas and technologies shaping our future.

In this installment, the report explores the metaverse and its potential impact on several key stages of the vision care journey.

When Facebook changed its corporate brand to Meta in November 2021, it ushered the metaverse into the public consciousness, forcing businesses and consumers to take notice.

But what exactly is the metaverse? Experts are divided on the scope of the term and its implications, with opinions ranging from the metaverse being an “embodied internet” to a “marketing gimmick.”

This ambiguity has made it hard for businesses to separate the noise from tech trends that can have significant business impact.

In this report, we cut through the hype and provide a framework for discussing metaverse-related technologies, especially as it relates to healthcare, and break it down into 6 key areas. We also identify unique opportunities where the metaverse may intersect with individuals along the vision care journey, including **discovery, engagement, care, and post-exam.**

While the concept of the metaverse is still in the early days, its longer-term implications could be significant. When the technology powering the metaverse matures, many parts of our lives, such as shopping, banking, seeing doctors, and even dating, might be done in immersive virtual worlds.

Given these possibilities, this report aims to survey the metaverse, leveraging VSP Vision's industry expertise to see how it will shape critical components of the healthcare, vision care, and eyewear experiences.

VSP Global Innovation Center and CB Insights

The state of the metaverse

The metaverse presents opportunities for a wide range of industries.

Facebook's rebranding led to a metaverse frenzy.

While the "metaverse" term has been around for decades, Facebook's rebranding to Meta signaled a new chapter for the concept. "Metaverse" searches spiked on the day of the announcement, according to Google Trends, and though interest, defined by daily searches, has returned to a new baseline, it's still considerably higher than "pre-Meta" times.

400+

The number of times executives mentioned metaverse in Q4'21 earnings calls.

While the metaverse currently lends itself well to entertainment and gaming, early applications are emerging across industries.

The entertainment sector is seeing some of the largest valuations of metaverse startups.

However, early applications are emerging across financial services, fitness, retail, and healthcare, as well. For example, Bank of America, the NFL, and Fidelity have all used VR training. In real estate, ONE Sotheby's is selling a mansion in the metaverse.

4M

VR exercise game Beat Saber has sold 4M copies

Metaverse startups in healthcare are still nascent. But promising research and applications are emerging.

Companies are testing the use of immersive therapy for severe mental health disorders, using augmented and virtual reality (AR/VR) for surgical training, fitness, and improving vision care, patient education, and more.

Researchers at John Hopkins University partnered with Osso VR to trial VR surgery training, which has shown promising results.

230%

Percent by which VR training startup Osso improves surgical skills compared to traditional methods.

The metaverse's vision care impact

The metaverse will intersect with several key stages of the vision care journey.

Discovery

An all-time high in gamers globally has led to an explosion of in-game advertising innovations, opening the door for healthcare brands to evolve how they reach patients and consumers.

Admix, for example, has developed in-game billboards for brands like Calvin Klein and McDonalds.

\$300M

Exit valuation of in-game advertising company Admix.

Engagement

The metaverse's applications in staff onboarding and training may trigger a massive downstream effect on the quality of care.

For example, Alder Hey Children's Hospital made gamified patient education content for children available both on VR and on the web.

Others like Accenture are buying VR headsets to virtually onboard employees, but the content is also accessible via computers.

\$42B

Expected size of AR/VR education market by 2027.

Care

With in-person immersive care companies getting a nod from the FDA, metaverse-adjacent technologies could come to the industry.

Luminopia develops VR-based therapies for children with amblyopia (lazy eye). In October 2021, the startup received FDA approval for its gamified vision treatment.

Another startup, Mojo Vision, received FDA breakthrough status to develop smart contact lenses that can assist people with low vision.

\$204M

Total funding raised by Mojo Vision.

Post-Exam

With computer vision improving remote fitting and virtual fashion, the metaverse is evolving the post-exam experience for eyewear consumers.

Walmart and Snap each acquired a computer vision-powered virtual try-on startup last year.

\$14.9B

Estimated virtual try-on market size by 2026.

Unbundling the metaverse

A framework for creating a common language to discuss the metaverse in healthcare, vision care, and beyond



The metaverse opportunity

Market estimates vary depending on how the analyst defines “metaverse.”

\$800B

Bloomberg Intelligence forecasts the Metaverse market to grow to \$800B by 2024.

\$2T

Citi says the Metaverse market could reach \$2T if narrowly defined, or \$13T globally by 2030 if broadly defined.

\$8T

Goldman Sachs predicted the metaverse could be “as much as an \$8T opportunity on the revenue and monetization side.”

Today the metaverse is defined as:

Shared worlds driven by virtual products and experiences that are highly immersive and interactive.

How that could change:

Massive shared worlds driven by virtual products and experiences that are highly immersive, interactive, and **interoperable.**

Breaking down the metaverse into 6 key areas

1. Infrastructure

The underlying technologies necessary to support a high-compute, low-latency experience

2. Access/interface

Hardware technologies that dictate how people will enter and experience the metaverse

3. Virtualization tools

Software for developers to build metaverse worlds and experiences

4. Virtual worlds

Where people will exist in the metaverse, characterized by their user-driven experiences

5. Economic infrastructure

How people will pay for and exchange goods and services in the metaverse

6. Experiences

The various goods, services, and experiences in the metaverse

The vendors building each layer of the metaverse

Infrastructure (network & computing)

Chips & processors



5G & low latency networks



Cloud infrastructure



Edge infrastructure



Access/interface (hardware)

Haptics



Headsets (VR)



Holographics



Smart glasses (AR)



Virtualization tools

3D design engines



3D modeling & capture



AR development kits



Avatar development



Volumetric video



Virtual worlds

Centralized worlds



Decentralized worlds



Economic infrastructure

Payments



Crypto exchanges



Crypto wallets



NFT marketplaces



Experiences

Gaming



Virtual concerts



Virtual fashion



Virtual real estate



Virtual work

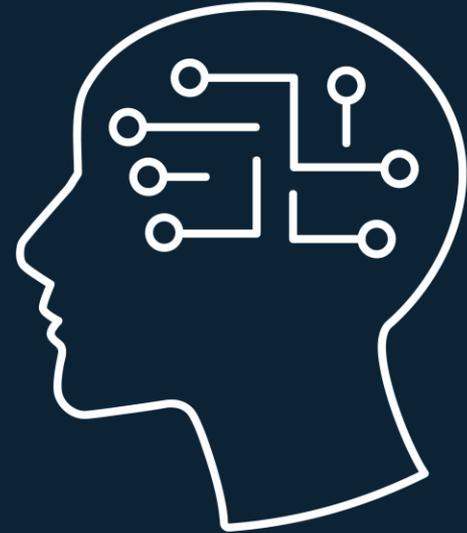


Other

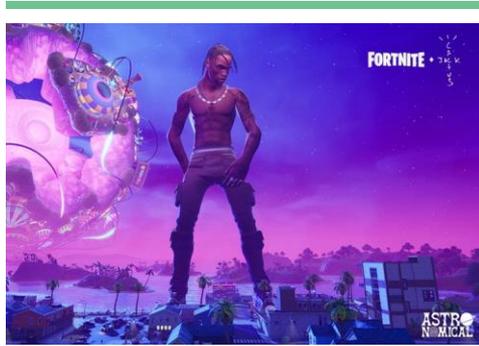


Understanding the metaverse through real-world applications

Early adoption across healthcare, finance, retail, and more



Virtual worlds & games set the stage for the metaverse



Fortnite, owned by Epic Games, hosted a virtual concert with Travis Scott that **drew over 12M attendees**. Most recently, Epic Games raised a \$2B round from Sony and private equity company KIRKBI at a \$31.5B valuation.



Gaming company Activision Blizzard claims that **more than 350M players worldwide engage with the company's games for over an hour a day**. In January 2022, Microsoft announced its intent to purchase Activision Blizzard for \$68.7B. Once the deal closes, it will be Microsoft's largest acquisition to date.



Virtual world Roblox reports that 202M users engage with its platform each month. It also claims that **more than 50% of U.S. children under the age of 16** have engaged with the game. Roblox is currently valued at \$29B.

Early applications emerge across industries



Retail

Burberry and Louis Vuitton have released custom games where players can dive into the brands' histories or collect fashion items such as bags, shoes, and more.

Virtual fashion could increase brand awareness while letting users express themselves in the metaverse. To that end, Nike recently acquired virtual sneaker company RTFKT to develop its own line of virtual shoes and clothing.



Finance & Insurance

Financial services companies are exploring new products based on virtual assets. JP Morgan, for instance, is exploring how virtual assets can be used as collateral for loans.

The high price of some virtual assets, coupled with a market rife with fraud and theft, could create an opportunity for insurers.

Companies like Fidelity and Bank of America are using VR to train new employees.



Entertainment

The metaverse is ushering in entirely new experiences like virtual concerts, immersive gaming, and e-sports.

Entertainment startups are some of the highest-valued metaverse companies, including \$9B Niantic (the company behind Pokémon GO).

The metaverse has diverse applications in healthcare



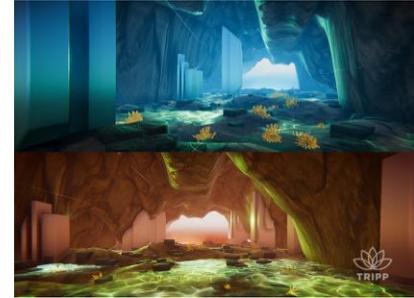
Surgery

Researchers at John Hopkins University partnered with Osso VR to trial VR surgery training. Osso reports the immersive training improves surgery skills 230% compared to traditional methods. AR/VR is also impacting live surgeries. Companies like Augmedics superimpose patients' CT scans in the surgeon's field of vision, keeping them from diverting attention to ancillary screens.



Fitness

VR fitness games are among the most popular VR apps. Beat Saber, a VR game where players slash at blocks to the rhythm of selected songs, has sold over 4M copies. Another fitness app, Supernatural, hones in on the social elements of working out. Friends can compete against each other for top spots on leaderboards or take workout classes led by fitness coaches.



Mental health

Startups like AppliedVR and Tripp develop soothing VR landscapes for meditation, relaxation, and pain relief. Another company, Oxford VR, simulates everyday activities – from visiting a store to riding public transportation – as exposure therapy for patients with agoraphobia. Agoraphobia patients saw a 47% reduction in symptoms, according to research published by the NHS.

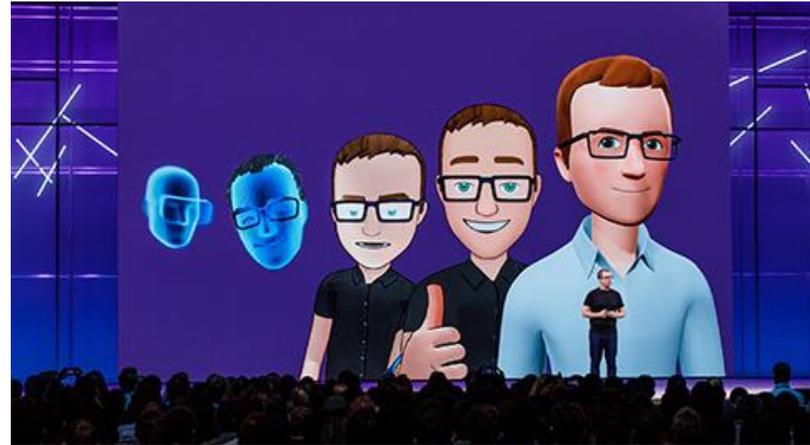
Big tech companies bet on AR glasses

Smart glasses with advanced interactive capabilities are still years away, but companies like Meta and Apple are betting on the tech's potential upside. Early research partnerships with smart glass startups or tech companies could lead to eyewear companies playing a pivotal role in developing the next generation of consumer hardware tech.

Meta is investing billions of dollars into smart glasses with the hope that they will replace smartphones as consumers' primary medium of engaging with the internet.

Startups like Magic Leap have attracted billions in funding, and corporations from Apple to Microsoft to Meta are investing resources in AR-focused R&D.

For AR to become mainstream, it will need to be unintrusive. This makes smart glasses a promising consumer hardware interface, and eyewear manufacturers are uniquely positioned to capitalize on this trend. In addition, eye care professionals will continue to play a critical role in monitoring AR/VR and smart glasses impacts on their patients' eye health.



Impact on the vision care journey

How the metaverse and metaverse-related technologies can change provider discovery, patient experience, care, shopping, and more



4 key areas of the vision care journey

We looked at the stages that are most likely to be impacted by the growth of virtual worlds and experiences and the trends that could drive change within each.



Discovery

Reaching new patients and consumers in the metaverse



Engagement

Improving knowledge retention and participation



Care

Exploring in-person immersive care and experiences



Post-Exam

Enabling remote fitting and virtual fashion



Discovery

How the metaverse can improve brand awareness for healthcare companies

1. In-game advertisements

With over 3B video gamers globally¹, gaming is building and validating a playbook for in-world advertising that can be replicated by other industries. Currently, in-game ads include virtual billboards, audio-based ads, and video ads, channels that can be leveraged by healthcare and vision care brands.

2. Branding in virtual worlds

Virtual worlds are where people will congregate and exist in the metaverse. Their potential reach presents unique advertising opportunities. For example, the market size for virtual worlds is expected to reach [\\$390B](#) by 2025.

3. Benefits fairs held in the metaverse

With the rise of remote and hybrid work, HR professionals and benefits providers have had to re-think the traditional benefits fair, exploring virtual environments and experience to revolutionize enrollment.

Vendors helping brands maximize virtual worlds

Audio advertising

These companies overlay audio ads during virtual experiences as to not interrupt play. They mostly focus on mobile games.

For discovery, these technologies would help healthcare brands target the estimated 1.7B¹ people that play mobile games as unobtrusively as possible.



Immersive advertising

These ads appear in virtual environments, often in the form of virtual billboards or more subtle product placement (e.g., a Pepsi bottle in a video game). Companies typically create ads across multiple platforms, from mobile devices to computers to gaming consoles to VR.

Some immersive ad companies target specific worlds or environments. For example, Super Biz designs ads exclusively in Roblox.



Branded experiences

Vendors here have expertise in using the custom world-building tools of popular virtual games. Gamefam, for instance, builds immersive Roblox and Minecraft experiences for brands attempting to reach and engage new audiences.

In healthcare, brands could create custom virtual worlds to help onboard new patients. In fact, one of Gamefam's popular Roblox games is Maple Hospital, a hospital role-play game designed with the help of a licensed nurse.



Ad platforms use immersive content to target consumers

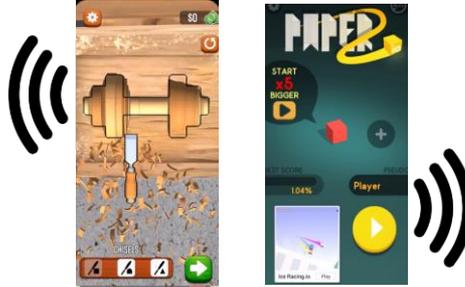


Last funding date: 12/08/2021

Funding amount: \$8M

Funding stage: Series A

Frameplay develops interactive 3D content and billboards to deliver in-game ads across consoles without interrupting the gameplay experience.



Last funding date: 11/19/2021

Funding amount: \$14M

Funding stage: Series A

AudioMob integrates mobile games with audio-based advertisements that don't interrupt gameplay. The startup's most recent round included Google Ventures, Lightspeed, and Sequoia.



Exit date: 6/20/2022

Exit valuation: \$300M

Exit type: Merger

In-game advertising company Admix merged with Landvault, a startup building branded environments in virtual worlds. Admix has developed in-game billboards for brands like Calvin Klein and McDonalds.

Nike, VSP gain visibility with virtual worlds and games



Nike partnered with Roblox to build its own virtual environment, Nikeland. Nike uses Nikeland to host small mini-games or events and release digital fashion goods, such as vintage jerseys, the newest Nike sneakers, and even sports sunglasses and athletic eyewear from Nike Vision.



VSP Vision teamed up with Kings Guard, the official NBA 2K League affiliate of the Sacramento Kings, to pilot new technology solutions with the goal of helping gamers play at their best.

VSP's branding also appears inside NBA 2K via strategic digital ads.

Virtual event platforms offer new avenue for discovery

Virtual events



Last funding: 8/5/2021
Amount: \$450M



Last funding: 10/12/2021
Amount: \$125M



Last funding: 2/1/2022
Amount: \$35M



Undisclosed



Last funding: 8/16/2019
Amount: \$770K



Last funding: 11/18/2020
Amount: \$12M



Last funding: 7/12/2019
Amount: \$4.5M



Undisclosed



Last funding: 6/28/2022
Amount: \$4.2M

Recent exits

On24 (previously backed by Goldman Sachs) IPOed at a \$2.1B valuation.

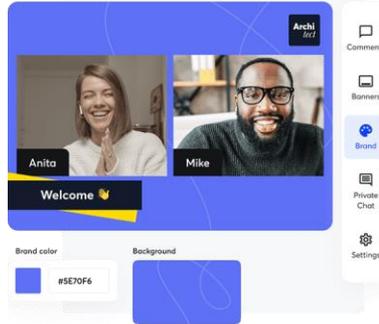
NextVR was acquired by Apple in April 2020 for \$100M.

Virtual events can also digitize the benefit fair



Funding info: Undisclosed

VFAIRS, a virtual event platform, offers intuitive virtual experiences to exhibitors and visitors alike, along with interactive features (audio/video chat) and several customization options.



Last funding date: 08/05/2021

Funding amount: \$450M

Funding stage: Series D

Hopin, an online events platform, is equipped with tools to create immersive attendee experiences, including virtual breakout rooms and keynote stages.



Last funding date: 06/07/2018

Funding amount: \$4.73M

Funding stage: Series A

Swapcard, a smart event engagement platform, uses AI to power virtual, live, and hybrid events, all from one platform.

Discovery in the metaverse

Trend	Takeaways
 In-experience advertising	Prioritize immersive ad formats that limit disruption of the virtual experience. <p>Immersive ads will help brands reach target audiences without disturbing them. For example, gaming giant Electronic Arts was forced to pull its ads from a UFC game due to backlash from players who were forced to stop playing and watch ads in the middle of round matches, despite having paid \$60 for the game. As healthcare's target audiences enter the metaverse, immersive ads will help brands facilitate discovery.</p>
 Branding in virtual worlds	Adopt a demographic-specific virtual world strategy. <p>Not all virtual worlds are the same. Estimates find nearly 75% of VRChat users are 18 – 34. Similarly, Naver's virtual world Zepeto claims most of its users are Gen Z women, while VRChat is 80% male. Healthcare brands can choose the right virtual worlds for outreach based on their target demographics.</p>
 Virtual benefits fairs	Use virtual events to make enrollment accessible and interactive. <p>Brands are already leveraging the metaverse to streamline and enhance live events. These could be applied to the enrollment process, bringing the traditional benefits fair into the virtual world.</p>



Engagement

How the metaverse can improve knowledge retention and participation for healthcare workers and patients

1. Virtual onboarding

In April 2022, Stanford economic professor Nick Bloom found that up to 35% of workers are remote. Virtual onboarding gives employers the opportunity to create engaging, scalable ways for teams to familiarize themselves with new cultures, benefits, and more from the comfort of their home. The employee onboarding software market is expected to reach [\\$2.2B](#) by 2027 at a 12% CAGR.

2. VR for training

The National Training Laboratory found that learners using VR had a knowledge retention rate of 75%, compared to 10% for retention through reading and 5% for retention from listening to lectures. The VR enterprise training market size is expected to reach [\\$6.3B](#) by the end of 2022.

3. Immersive patient education

The broader AR/VR education market is expected to reach [\\$42B](#) by 2027 at a 77% CAGR, but the patient education market is currently nascent. Immersive patient education can use gamification to create engaging experiences, and its potential to improve knowledge retention will help patients feel more informed and prepared for procedures.

Companies explore validity of VR as onboarding tool

accenture

In 2021, Accenture partnered with Microsoft-owned AltspaceVR to build a virtual environment to on-board remote hires.

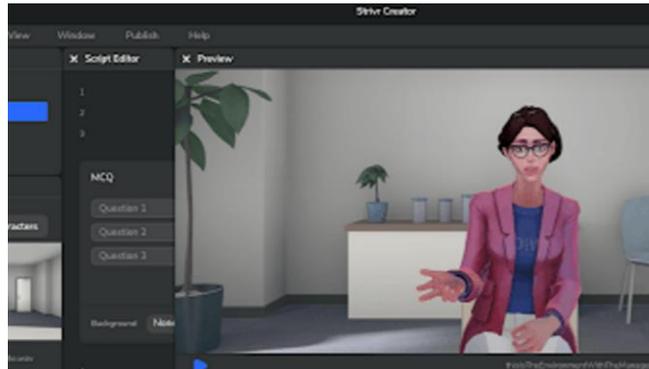
This virtual environment, known as the Nth Floor, is accessible by both VR and computer. However, Accenture has purchased 60,000 Meta Quest headsets that it supplies to employees free of charge if they're interested in the most immersive experience.

In the Nth Floor, new hires create avatars and team up to play learning games or experience unique parts of the consultancy's culture.

Accenture expects 150,000 employees to access and train in their custom metaverse by the end of 2022. They also expect the world to expand beyond an onboarding experience and into a permanent workstation for employees.



Enterprises leverage VR training platforms



In April 2022, Strivr raised a \$35M Series B for its VR training platform. Bank of America uses Strivr to train BoA employees on various skills – from fraud detection to navigating sensitive conversations with clients. Of the 50,000 BoA employees who used Strivr, 97% reported increased confidence, effectiveness, and retention of training materials.

Strivr also works with the NFL, Fidelity, and others.



In July 2022, Pixo raised a \$6.5M seed round for its training platform. Currently, Pixo focuses on heavy industries like oil & gas or construction, but it is also developing VR simulations for soft skills development.

Pixo clients include Ford, Intel, and General Dynamics.

Hospitals tap into AR/VR for educating children



In March 2022, Children's Health of Orange County partnered with AR/VR vendor EON reality to develop an immersive patient education experience called "An MRI with Choco." Children can use an iPad camera to walk through a hospital and MRI equipment as they are guided by an AR teddy bear avatar named Choco.



In June 2022, Alder Hey Children's Hospital partnered with metaverse workplace startup PixelMax to develop a digital twin of the health center's radiology department. Young patients can use VR or web to travel through the hospital and interact with equipment like X-Ray machines or MRI scanners to learn how they work and earn badges.

Engagement in the metaverse

Trend	Takeaways
 Virtual onboarding	Make immersive onboarding available across platforms. <p>Despite the previously mentioned benefits of VR training and education, use of VR headsets is far from mainstream. Any immersive experience for healthcare brands, be it onboarding new members or onboarding new employees, needs to be available on popular devices like smartphones or computers. Otherwise, the audience will be severely limited.</p>
 VR training	VR training could be used internally by healthcare brands, but the technology is not nearly ubiquitous enough for patients or clients externally. <p>The advantages of VR training are undeniable, but its potential as a tool to help patients is severely limited by the number of people who own a VR device. However, VR training could be used as an internal tool. Healthcare brands can take advantage of pre-developed vendor solutions for training internal sales and support teams, improving soft skills, or ramping up their network of care providers.</p>
 Immersive patient education	Consider offering immersive patient education for surgeries. <p>Cancer patients who underwent VR education saw significant improvements in how well they understood their disease, and 97% preferred it to all other educational tools, according to research conducted by UC Health. Immersive education does not need to be VR; however, healthcare brands should consider using gamified experiences to educate patients while preparing for a future shift to AR/VR.</p>



Care

How the metaverse can improve remote and in-person eye care

Immersive vision care

Vision care vendors using AR/VR are developing engaging tests to screen for disease, fun games that help train eyes, and assistive technology to help people with impaired vision navigate the real world.

The immersive vision care market is mostly nascent, but immersive technologies across healthcare are gaining traction. The broader AR/VR healthcare market is expected to reach \$7.8B by 2027 at a 26.1% CAGR.

VR startups tackle eye care opportunities



Dark Adaptation

CPT 92284

Measure dark adaptation to evaluate retinal function.

Last funding date: 05/20/2021

Funding amount: \$30M

Funding stage: Series A

Heru, a spinout of the Bascom Palmer Eye Institute, develops VR-based diagnostic software for optometrists. Heru partners with Magic Leap for its headsets.



Last funding date: 12/13/2019

Funding amount: \$11.11M

Funding stage: Seed

Luminopia develops VR-based pediatric (4 – 7 years old) therapies for amblyopia. **In October 2021, the startup received FDA approval** for its gamified vision treatment.



Last funding date: 03/08/2022

Funding amount: \$5.27M

Funding stage: Series A

Korea-based VROR combines VR with computer vision to identify and treat vision problems. By capturing biomarkers from pupils, gaze, muscular movements, and more, the startup claims it can use AI to provide personalized treatments.

MagicLeap shares latest AR headset with startups



Funding amount: \$15.73M

Funding stage: Angel

SentiAR is developing a 3D visualization platform with real-time cardiac holograms for real-time intraprocedural use, resulting in a safer, faster procedure.



Funding amount: \$11.11M

Funding stage: Private Equity

Brainlab offers software and hardware solutions for radiotherapy, radiosurgery, and surgical navigation. Its Mixed Reality Viewer provides methods for reviewing surgical plans and collaborating with colleagues, which could offer access to new insights into patient procedures.



Funding amount: \$5.25M

Funding stage: Series A

SyncThink is a neuro-technology company behind the EYE-SYNC device, a fully-integrated, head-mounted eye-tracking device for rapid, reliable screening of attention focus.

FDA grants breakthrough status for smart contacts



In November 2018, Mojo Vision emerged from stealth with a \$50M Series A funding round and announced that it was developing the first-ever augmented reality contact lenses.

While Mojo Vision claims its technologies will impact consumers across industries, it has strategically prioritized using AR for vision care.

In 2020, the company received FDA breakthrough status to develop smart contact lenses that can assist people with low vision. This builds on research conducted by Mojo Vision's Chief Scientist, Michael Deering, who focused on using AI-powered prosthetics for people with impaired vision.

Mojo Vision has built a dedicated clinical research and science team composed of doctors of optometry and AI researchers.



Care in the metaverse

Trend

Takeaways



Immersive vision care

Consider early research partnerships with immersive vision care startups.

Partnerships with immersive vision care companies can keep healthcare brands on the cutting edge. They can also provide key information on how patients and care professionals respond to immersive therapies before making decisions to build, invest, or acquire. While startups have experimented with AR/VR in vision care long before the metaverse hype, there have been major advancements to AR/VR over the last 7 years, such as improved computer vision – a field of AI that uses algorithms to process and interpret visual data from videos and images – and more powerful processors.

Leverage AR/VR to capture eye-related data.

AR/VR headsets, goggles, and eyewear will bring cameras and the eye closer than they've ever been. With AI applications on the rise, data is more valuable than ever. Images and videos of the eye could be key in developing algorithms for diagnostics, emotion detection, and intent recognition, among other uses.



Post-exam

How the metaverse can transform remote fitting and shopping for eyewear after an in-practice exam

1. AI-powered fitting

Computer vision is powering the next generation of fitting and try-on. Computer vision not only helps companies accurately superimpose eyewear with augmented reality, it can also measure pupillary distance and other facial features to find the best-fitting products. The virtual try-on market size (including applications beyond eyewear) is expected to grow to \$14.9B by 2026 at a 23% CAGR, with the metaverse introducing evolutionary possibilities to an already hot technology.

2. Virtual fashion

Virtual fashion includes outfits designed for avatars or outfits users can only wear using augmented reality filters. Roblox and Fortnite are examples of companies adopting the former tactic, allowing users to dress virtual avatars in looks from co-branded NFL jerseys to custom devil wings. Meanwhile, startups are taking the latter approach, selling NFTs (non-fungible tokens) that act as proof of ownership for metaverse styles that users can only access in augmented reality.

Virtual try-on tech spikes during Covid

Amid the pandemic, virtual try-on emerged as a new way for brands to engage consumers, increasing conversions in eyewear.

456%

Bollé Brands claimed its virtual try-on partnership with Qreal and M7 led to a 456% increase in sales. The AR campaign included services for:

- **Try-on:** People “try on” products via smartphone.
- **Try-out:** People use the smartphone camera to see how the world looks through the lens of colored ski goggles, sunglasses, etc.

600%

Bailey Nelson partnered with AR startup Plattar to develop a virtual try-on solution. Bailey Nelson saw:

- **Online sales increase 400%** in Australia
- **Online sales increase 600%** in Canada

Since then, Plattar has added virtual try-on as a core service and added US-based eyeglasses company Ollie Quinn as a client.

85%

Eyewear online retailer Eyeconic has recently increased its virtual try-on coverage by roughly 30%, with 85% of its total assortment now having this capability.

AI, 3D imaging power developments in remote fitting

FUEL3D
SHAPING FUTURES



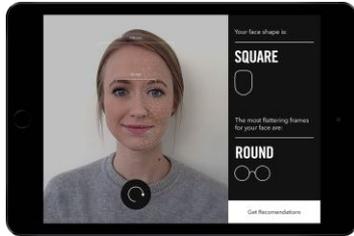
Various startups are developing solutions combining machine learning, computer vision, and 3D imaging technologies that could provide the foundation for the next generation of remote fitting.

For example, U.K. startup Fuel3D is using a proprietary 3D processing model to deliver sub-millimeter optical and face-fitting measurements through its app FitsYou.

In addition, the startup is deploying this technology through a partnership with medical equipment company ResMed – creating better fitting CPAP masks to treat sleep apnea – and through its product BioVolume, which does 3D scanning of tumors. While facial scanning for remote fitting is not uncommon, Fuel3D's various applications hint at the technology's growing potential.

Virtual try-on space sees major exits

ditto



Acquired by 1-800 Contacts

Exit date: 10/07/2021

1-800 Contacts acquired Ditto, a startup developing virtual try-on for eyewear. Ditto's customers included National Vision, Specsavers, and VSP Vision. Ditto's PD measurement tools are now a part of 1-800 Contacts subsidiary Luna's offerings.



memomi



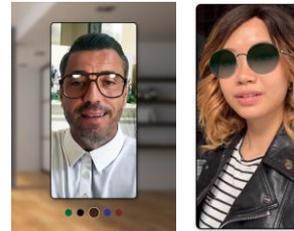
Acquired by Walmart

Exit date: 6/29/2022

Memomi's eyewear try-on mirrors could be found across 2,800 Walmart Vision Centers and 550 Sam's Clubs. The startup also powered the Optical eCommerce experience on SamsClub.com. Its AI and AR tools for eyewear include PD measurement.

Sources: Ditto, memomi, vertebrae, Perfect Corp

vertebrae



Acquired by Snap

Exit date: 7/19/2021

Snap acquired Vertebrae, a startup using AR to create 3D visualizations of products. Vertebrae has worked with brands like Tenth Street, Herschel, and eyewear company Goodr.

PERFECT



Exit via SPAC

Exit date: 3/3/2022

Perfect Corp announced it would exit via SPAC in Q3 at a \$1B valuation. The startup offers virtual try-on solutions in eyewear, beauty, and other accessories. The company's computer vision tech includes pupillary distance detection software.

Metaverse gives rise to virtual fashion

Most virtual fashion startups include two key components:

- **Ownership:** When you purchase a physical fashion item, proof of ownership exists within a receipt. In the virtual fashion world, this proof of ownership exists as an NFT, which is a blockchain-based receipt verifying that the virtual item belongs to you.
- **AR filters:** Digital fashion items often allow owners to use augmented reality filters to “wear” their outfits.

While this is the trend among startups, virtual fashion does not have to be AR or NFT-based. Roblox and Fortnite generate revenue by selling virtual fashion items that players can use to dress up their avatars. These companies have also partnered with brands like Gucci, Louis Vuitton, and Balenciaga.

Virtual fashion startups



Disclosed funding: \$145M
Stage: Series A



Disclosed funding: \$14M
Stage: Series A



Disclosed funding: \$3.3M
Stage: Seed



Disclosed funding: \$3.5M
Stage: Pre-seed



Disclosed funding: \$4.5M
Stage: Seed



Disclosed funding: \$6M
Stage: Seed



Disclosed funding: \$4M
Stage: Series A

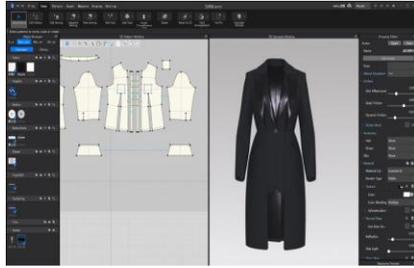


No disclosed funding



No disclosed funding

Startups powering digital-first fashion



Last funding amount: \$100M

Total funding: \$145.08.11M

Funding stage: Series A - IV

Style3D develops 3D design tools for fashion brands to simulate new outfits. These designs are used as blueprints for both physical and virtual fashion.

DRESSX



Last funding amount: \$1.3M

Total funding: \$3.3M

Funding stage: Seed VC - II

DressX, a digital fashion and multi-brand retailer, carries digital fashion collections from well-known contemporary brands born in the physical world and in the digital space.

AUROBOROS



Last funding amount: Undisclosed

Total funding: Undisclosed

Funding stage: Undisclosed

Auroboros, a digital couture company, became first brand to show a digital-only, ready-to-wear collection at a major fashion week event in 2021

Post-exam in the metaverse

Trend

Takeaways



AI-powered fitting

Monitor the evolutions in remote fitting capabilities.

Virtual try-on technologies have made considerable strides in recent years and the metaverse offers a potential springboard into its next chapter. In fact, Meta and Snap have released AR developer tools so brands can use computer vision to easily improve virtual try-on experiences for patients and consumers. In addition to expanding these existing capabilities, the metaverse may also power advancements in remote fitting, allowing for measurements to be captured virtually that can then be used to build glasses.



Virtual fashion

Explore additional branding opportunities.

Fashion is the go-to form of self-expression in the metaverse. Marchon partners like Nike and Lacoste are already capitalizing on this by entering virtual worlds and developing custom skins, looks, and experiences. Eyewear brands could partner with virtual worlds or metaverse fashion startups to improve visibility of their products or to develop eyewear that mimics popular virtual skins (see slide 20).

A white silhouette of a person climbing a white mountain peak against a blue background. The person is holding a flag on a pole. The mountain has a cloud at its base.

Our call to innovators

This report highlights numerous companies and startups leveraging the metaverse to drive value for brands in healthcare, vision care, and various other industries. And the technologies highlighted are just the beginning: continued innovation will raise expectations for how virtual worlds will evolve and enhance the patient's experience and journey.

At VSP Vision, we are constantly reimagining the way eye care and eyewear are delivered to the world. To fulfill this promise, the VSP Global Innovation Center (GIC) is actively seeking new startups and technologies to collaborate with on forward-looking innovations. Interested in connecting? Let's talk.

Get in touch with us at globalinnovationcenter@vsp.com

About the producers



VSP Global Innovation Center

At VSP Vision, our purpose is to empower human potential through sight. As the first and only national not-for-profit vision benefits company, VSP has been the leader in health-focused vision care, providing affordable access to eye care and eyewear for more than 80 million members through a network of more than 39,000 doctors.

The VSP **Global Innovation Center (GIC)** is VSP's lens into the future.

Through emerging technologies, new business exploration, and strategic connections within the innovation ecosystem, the GIC is a hub for reimagining the way eye care and eyewear are delivered to the world.

To learn more, please visit www.vspglobal.com/innovation



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