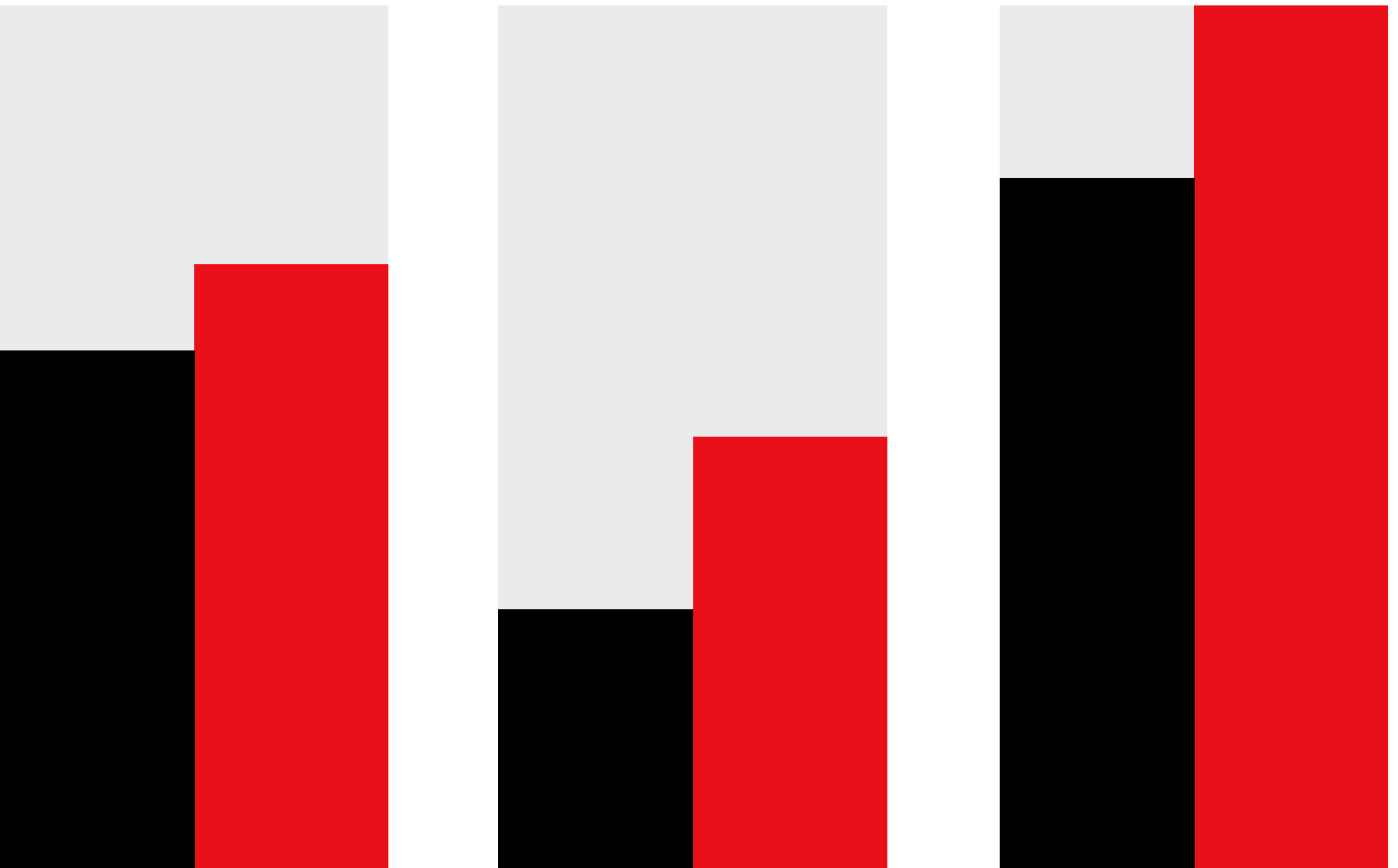




AR and VR Are Reshaping the Future of Consumer Engagement

Mobile Adoption Skyrockets as Headsets Find New Niches

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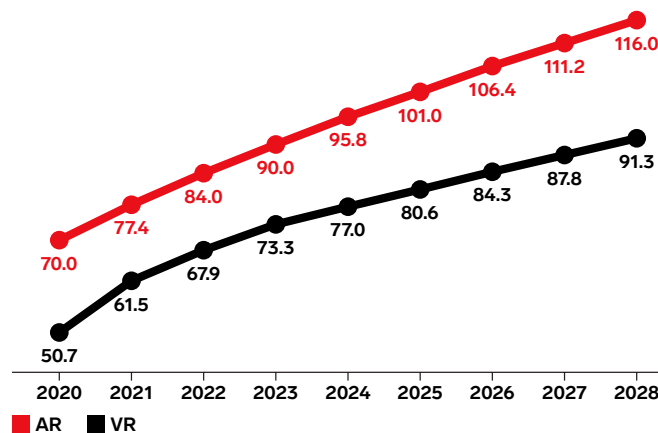
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AR and VR Are Reshaping the Future of Consumer Engagement

- **This could be a landmark year for immersive technologies.** VR user penetration will hit critical levels across key demographics, and AR is gaining ground through mobile and social media. The tipping point will present new opportunities and challenges for advertisers.
- **AR's expansion is transforming the consumer landscape, with mobile devices leading the charge.** Immersive experiences are becoming more accessible thanks to the ubiquity of smartphones and the integration of AR features into popular apps. As major tech players like Apple invest heavily in AR technology, a new era of spatial computing is emerging that will affect how consumers interact with digital content.
- **VR's popularity is growing, but there's a tradeoff in immersive experiences.** Device wearability is often at the expense of the depth of the visual experience.
- **AR and VR are an increasingly important part of the media mix—but patience is key.** Advertisers should incorporate the technology into their strategies. ROI won't be immediate, however, as the immersive technology landscape continues to change and mature.

US AR and VR Users, 2020-2028

millions



Note: individuals of any age who experience augmented/virtual reality content via any device at least once per month

Source: EMARKETER Forecast, May 2024

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Definitions: Immersive Media

Augmented reality (AR) allows users to engage with digital content, such as virtual objects and information, that is superimposed on the real world. This technology is used in various applications, including filters for photos and videos (e.g., Snapchat Lenses); gaming experiences (e.g., Pokémon Go); retail and ecommerce (e.g., Ikea Place app and Sephora Virtual Artist); navigation through head-up displays; and educational or professional training using specialized headsets (e.g., HoloAnatomy).

Virtual reality (VR) places users in a dynamic, 360-degree digital environment through devices such as connected TVs (CTVs), computers, smartphones, and specialized VR headsets. Applications include immersive photos and videos (e.g., Google Earth VR); gaming experiences (e.g., Horizon Worlds); and virtual simulations for product demonstrations or virtual showrooms.

Mixed reality (MR) combines elements of both AR and VR, enabling users to interact with digital objects that are integrated into the real-world environment in an immersive way that prioritizes longevity of wear (e.g., Microsoft HoloLens 2 and Magic Leap 2).

Extended reality (XR) is an umbrella term that encompasses AR, VR, and MR, and is frequently used to describe devices that integrate all three technologies. XR headsets can display fully immersive virtual environments as well as a “passthrough” view of the real world enhanced with digital overlays. Most VR headsets also support XR functionality.

Smart glasses are technologically advanced eyewear that can overlay digital information onto a user’s real-world view, providing an AR experience.

Immersive media, juiced by AI, represents the future of consumer engagement

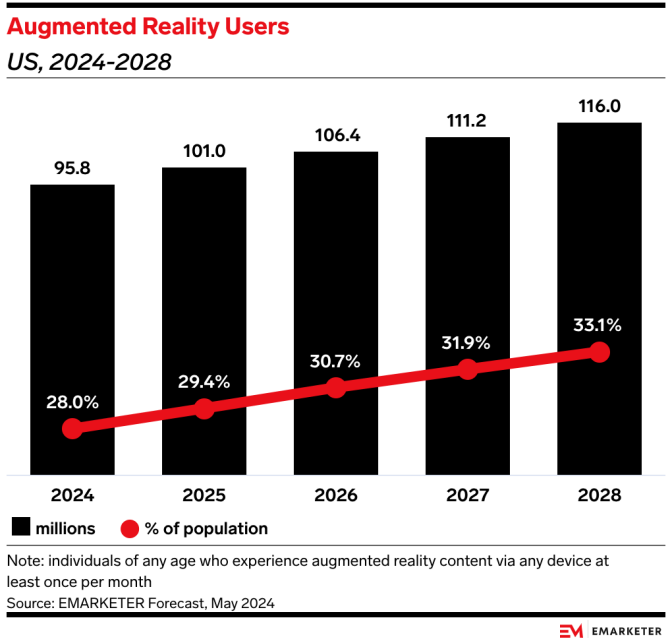
AR is expected to pass 100 million users in the US in 2025. Adoption is already widespread, but user growth is still limited to certain use cases in gaming, social media, and shopping. As AI evolves and Apple dives into the market, we expect immersive experiences to become more sophisticated and varied. Additionally, increased competition could spur innovation and tip the scales with increased adoption this year.

Better AR tools will likely lead to new ways for marketers to engage with consumers. Existing options, including social media filters and virtual try-ons, will get better. But new experiences are emerging in game worlds, such as Roblox and Fortnite, and the budding competition between Apple and Meta should accelerate innovation.

Notable uptakes in AR user penetration are surpassing expectations

For AR, in particular, growth is driven by advancing technologies and their integration into daily activities like shopping, vehicle navigation, and social media, indicating a shift toward more interactive and augmented digital interactions.

VR adoption is expected to grow steadily, but mobile AR is poised for more rapid expansion. By 2028, the number of VR headset users in the US will reach 54.4 million, while mobile AR users will reach 99.2 million. Nearly 86% of all AR users will be mobile AR users by 2028.



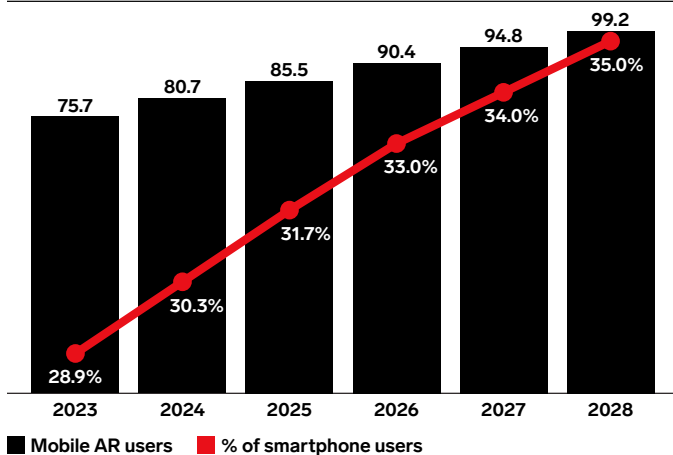
What’s driving the rapid adoption of AR?

Several factors are propelling AR growth. Those include the nearly universal adoption of smartphones; the immense popularity of mobile gaming; social media integration; and the increasing use of AR in retail shopping experiences.

Smartphones

- **Widespread smartphone adoption enables AR experiences.** The ubiquity of smartphones has made AR accessible to a broad range of consumers, enabling them to experience AR through their device's camera and screen. In the US, we expect there will be 80.7 million mobile AR users in 2024, growing to 99.2 million by 2028 and representing 35.0% of all smartphone users.

US Mobile AR Smartphone Users, 2023-2028
millions and % of smartphone users



Note: individuals of any age who experience augmented reality content via mobile device at least once per month
Source: EMARKETER Forecast, May 2024

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- **The rise of AR smart glasses may slightly diminish mobile's dominance in the long term.** But the integration of on-device generative AI (genAI) is transforming the smartphone landscape, paving the way for a new era of personalized and dynamic mobile AR experiences.

Gaming

- **Mobile gaming introduced AR to a vast audience.** Games like Pokémon Go, which uses AR to overlay virtual features on the real-world gaming environment, showcase the technology's potential for engaging, interactive experiences. Launched in 2016, the game has been downloaded over 1 billion times and has generated more than \$6 billion in revenues.

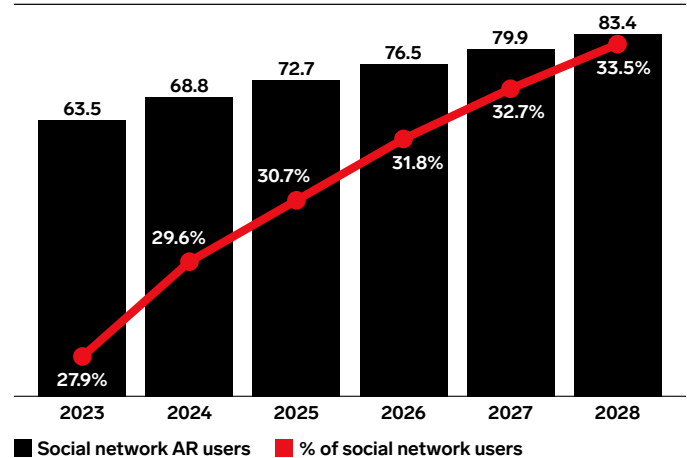
Social media

- **AR redefines social media interaction and content creation.** Social media platforms like Snapchat, Meta's Spark AR, and TikTok's Lens Studio have integrated

AR tools that allow users, advertisers, and content creators to develop and share augmented content, driving increased interaction, social connectivity, and engagement—and, for advertisers, boosting conversion rates.

- **Integration with social platforms makes AR accessible to more consumers.** Snapchat, for instance, has more than 250 million active users worldwide engaging with AR daily. And Meta's Spark AR platform, used by Instagram and Facebook, has over 600,000 creators from 190 countries, further expanding AR's reach.

US Social Network AR Users, 2023-2028
millions and % of social network users



Note: individuals of any age who experience augmented reality content within a social network via any device at least once per month
Source: EMARKETER Forecast, May 2024

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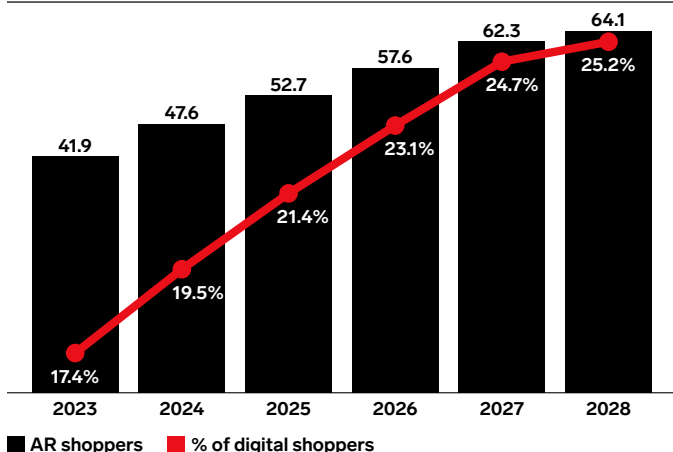
- **Social media platforms drive AR adoption, but diversifying use cases may shift the balance.** Approximately 85% of all mobile AR users in the US are accessing AR via social platforms. However, as more mobile AR use cases emerge across app categories, from educational tools to navigational aids, the share of social network AR users will decline slightly, suggesting a broadening of AR applications in the mobile ecosystem.

Retail

- **AR transforms the shopping experience.** AR enables customers to visualize products in their own space and virtually try on items, like clothing and cosmetics. These immersive experiences enhance convenience, boost engagement, and potentially increase sales, making AR an increasingly essential tool for retailers in the digital age.

US AR Shoppers, 2023-2028

millions and % of digital shoppers



Note: internet users of any age who browse, research, or compare products using augmented reality, in-store or remotely, via any device at least once per month but do not necessarily make a purchase

Source: EMARKETER Forecast, May 2024

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- **AR usage is experiencing notable growth in ecommerce.** AR usage in the US has grown to 40% in 2024, up from 26% five years ago, according to our April 2024 survey conducted by Bizrate. And 38.2% of respondents hadn't used AR or VR for shopping but were somewhat or very interested in doing so.
- **AR advertising drives purchase intent.** After a single exposure, Snapchat AR Lenses increase consumers' short-term and long-term likelihood to buy by 53% and 31%, respectively, according to a June 2024 report from Advanced Television. The lenses capture five times more active attention than other social media platforms, with ads actively watched 81% of the time.

AI could be a driving force behind AR's contextual evolution

AI helps AR devices provide content that is relevant to the user's location and activity. This is particularly important considering AR devices like smart glasses, which are designed to be worn continuously and integrate digital content into the user's environment.

- **The rise of interest in AI-enabled wearable devices could trigger a wave of new AR smart glasses in the coming years.** Meta and Apple are likely candidates—and possibly Google, as it considers reviving its Glass AR product, this time with a genAI twist.
- **AI will be a key factor in boosting immersive media adoption rates.** One notable example is Meta's Ray-Ban smart glasses, which are relatively affordable at \$299. They feature an AI virtual assistant that can answer questions about what a person is looking at. Enthusiasm over the smart glasses' performance could boost AR interest more broadly.
- **Innovations in AI will affect VR adoption, too.** But the increasing integration of AI capabilities in smartphones and the growing popularity of mobile applications is more relevant for AR.

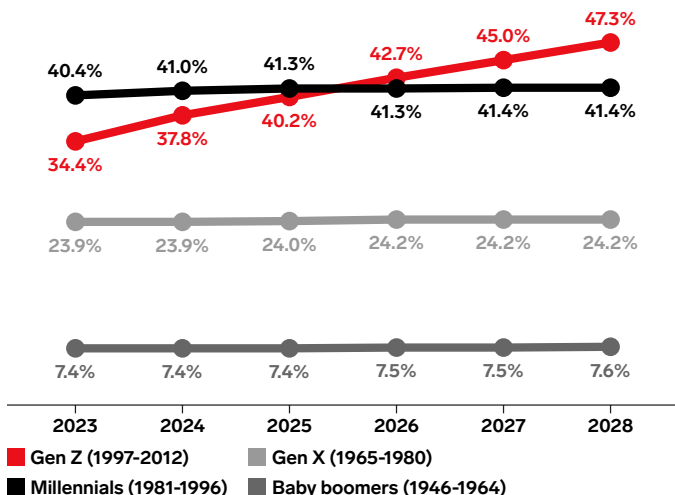
VR growth ebbs and flows its way to mainstream adoption

More users are experiencing VR through various devices. But significant fluctuations have been the hallmarks of VR growth as it rides the waves of technological advancement and consumer attention spans.

The overall trend suggests sustained, but slowing, VR growth. More users are experiencing VR content through various devices such as CTVs, PCs, smartphones, and headsets.

- **We expect growth to slow to 4.0% by 2028.** The growth rate reached an impressive 109.6% in 2017—but besides intermittent spikes, interest has generally declined since then.
- **Nearly 72% of VR users are either Gen Zers or millennials.** The dominance of these digitally savvy cohorts suggests that they'll be the primary drivers shaping the sector's trajectory.

US VR User Penetration, by Generation, 2023-2028 % of internet users



Note: individuals who experience virtual reality content via any device at least once per month
Source: EMARKETER Forecast, May 2024

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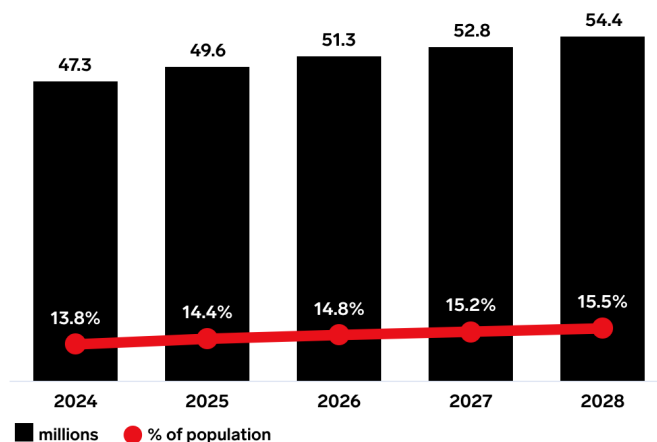
VR headset adoption and use remains modest—but that may change

Gaming remains the primary use case for VR headsets.

If the market reaches saturation, it's unlikely that headsets will evolve from novelty to must-have household devices. But a key to growth lies in expansion outside of gaming—in areas such as shopping, healthcare, and manufacturing.

- **We estimate that 15.4% of internet users use a VR headset at least once per month.** We expect only about a 2-percentage-point increase by 2028 (to 17.0%), driven by the emergence of new VR and AR device formulations, such as AR smart glasses, competing with traditional VR headsets.

Virtual Reality Headset Users US, 2024-2028



Note: individuals of any age who experience virtual reality content via headset at least once per month

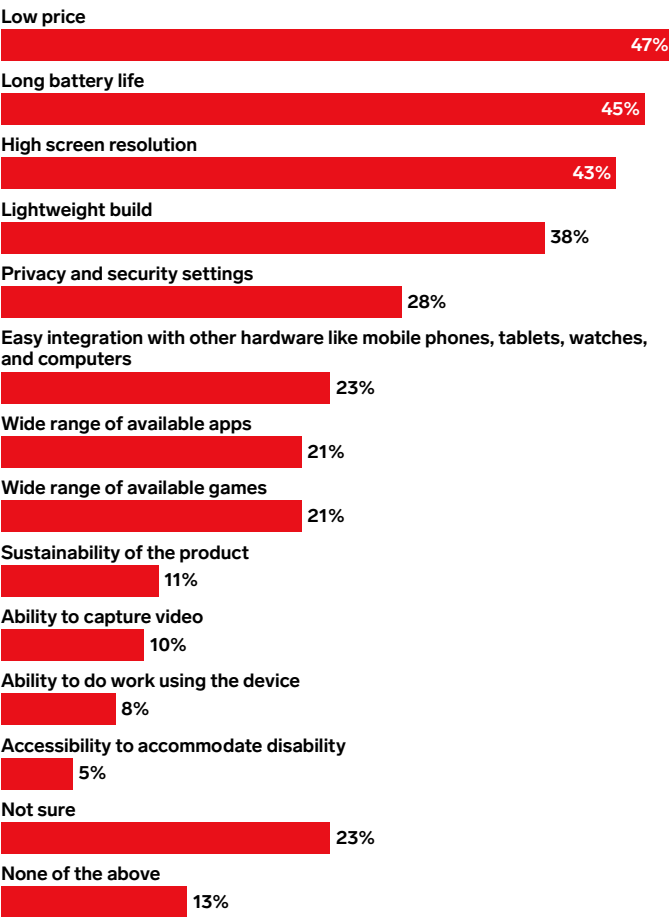
Source: EMARKETER Forecast, May 2024

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- **After 22.7% YoY growth in VR headset use in 2022, growth settled at slightly more than 9% last year.** This is up from our previous estimate of 6.1%, boosted by Apple and Meta VR headset launches. Through 2028, YoY growth will stay between 3% and 6%.
- **Apple's Vision Pro and Meta's Quest 3 could significantly influence AR/VR adoption.** Coming from two tech giants with massive influence, these devices are setting new standards in the industry. Smartphone OS integration could further facilitate adoption, increasing consumer comfort with the technology.

Features That Are Most Important in a VR Headset According to US Adults, Jan 2024

% of respondents



Note: ages 18+; top 5 responses
Source: YouGov as cited in company blog, Jan 19, 2024

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- But just because consumers buy headsets doesn't mean that they use them. Well over half (56%) of teen VR device owners rarely use them, according to a survey from Piper Sandler. More promising, however, is that 76% of people who have tried using VR headsets found the experience to be positive, per a Harris Poll survey.

MR rises to balance immersion and wearability

Comfort and sophistication—a tradeoff? A key challenge for the VR market is achieving lightweight, comfortable headset designs for extended wear while not compromising the technological sophistication required for advanced immersion. Case in point: Apple's Vision Pro showcases robust capabilities, but some users have complained about device weight and fatigue during extended wear.

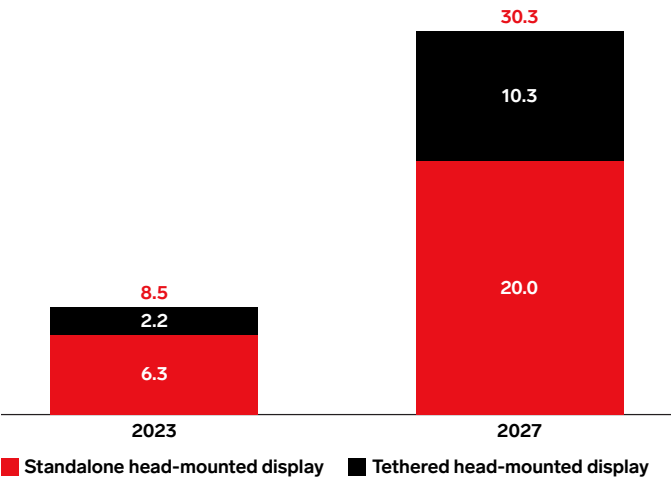
There is a shift toward lighter, more wearable MR forms. As concerns grow regarding user health and comfort, designers are looking to allow for longer wearability.

- The Varjo XR-4 headset contains dual high-resolution displays, advanced eye tracking, and a wide field of view, while also offering an ergonomic design for comfort during extended wear.
- The Magic Leap 2 headset similarly blends a wide field of view, advanced spatial audio, and an ergonomic design that prioritizes wearer comfort.

Despite tepid growth among US users, global headset growth should be strong. More than 30 million headsets will ship worldwide by 2027, according to International Data Corporation (IDC).

AR/VR Headset Shipments Worldwide, by Type, 2023 & 2027

millions



Note: screenless viewer shipments excluded from 2023 totals due to extremely low shipments
Source: International Data Corporation (IDC), "Worldwide Quarterly Augmented and Virtual Reality Headset Tracker" as cited in press release, Sep 19, 2023

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How should advertisers capitalize on the growth in immersive media?

Tech giants are making major investments in R&D for virtual devices, which could yield new devices to motivate customers and create fresh opportunities for brands.

- **Seize the AR/VR opportunity.** Act now to gain an early-mover advantage by developing the language and skills needed to create compelling experiences within this space.
- **Invest in VR and AR as R&D costs.** Advertisers should treat their investments more as R&D expenses rather than immediate revenue sources. This approach prepares brands for future opportunities without immediate profits—a lagging ROI.
- **Create AR/VR-specific ad formats.** Design and test the performance of ad formats tailored to immersive environments such as 3D product placements, 360-degree video ads, and interactive branded overlays.
- **Implement AR/VR analytics and metrics.** Develop a measurement framework to track and analyze user engagement, behavior, and conversion rates within immersive experiences, allowing for data-driven optimization and ROI assessment.
- **Explore AR experiences in out-of-home (OOH) advertising.** While AR/VR experiences are expected to spur some growth in OOH advertising, the growth is relatively small compared with other OOH opportunities. However, OOH can still play a key role in providing engaging virtual experiences that connect with consumers in novel ways.

EMARKETER Interviews

EMARKETER research is based on the idea that multiple sources and a variety of perspectives lead to better analysis. Our interview outreach strategy for our reports is to target specific companies and roles within those companies in order to get a cross-section of businesses across sectors, size, and legacy. We also look to interview sources from diverse backgrounds in order to reflect a mix of experiences and perspectives that help strengthen our analysis. The people we interview for our reports are asked because their expertise helps to clarify, illustrate, or elaborate upon the data and assertions in a report.

Michael Boland

Founder and Chief Analyst

ARtillery Intelligence

Interviewed April 3, 2024

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