Video games have steadily risen in popularity for years. And with the social benefits of video games becoming more apparent, the trend has only accelerated. Gaming is now a bigger industry than movies and sports combined.

Revenue for gaming reached $184 billion in 2022, and the number of gamers is expected to grow to 3.6 billion by 2025. It's not just kids either: 38 percent of gamers are between the ages of 18 and 34 years, and 16 percent are older than 55.

So what's next? Culturally, gaming will only continue to become more mainstream. But what tech innovations are shaping the future of video games, and how will they influence the gaming experience?

For decades, virtual reality (VR) — three-dimensional simulations players access via headsets — has tantalized gamers with the prospect of a fully immersive experience. But the technology has been slow to deliver on that promise.

Polygon's Ben Kuchera put it bluntly in 2020: "VR has been five minutes away from some kind of breakthrough for about eight years."

VR is still a niche category when compared to the rest of the gaming industry, with sales and manufacturing reflecting this: The global shipments for VR and AR equipment fell by 12 percent in 2022. And despite its buzzy status, it continues to give many consumers pause.

"Right now we're sort of in this trough of disillusionment about VR," Kevin Mack, a VR game developer, told Built In in 2020. "There was a lot of hype around it in 2015 and 2016, and then the whole world sort of got butt-hurt that their first-generation VR headset didn't instantly morph into the Holodeck."

Although VR has hit a few bumps along the way, tech and gaming companies are busy trying to advance the industry, investing considerable resources to develop VR hardware and games. Companies like Meta, Valve, PlayStation and Samsung have all ventured into the VR industry over the last several years. Apple is even rumored to be developing a VR/AR system, although there have been delays and issues. This trend of investment is likely to continue with the VR game industry projected to grow at 30.5 percent by 2028.

There are promising developments on the horizon for VR. But first, a few challenges need to be addressed. Namely, the bulky headsets and high prices.

Most VR headsets weigh over a pound and must be strapped tightly to a user's face. It's not terribly comfortable. You get sweaty and after a half hour of play your energy is sapped.

This experience chafes against that mode of playing that is typical of gaming enthusiasts — spending hours comfortably sunk into a couch. If VR hardware can't align with the preferences of gamers, will it be able to survive? Until companies slim down their VR headsets, get rid of cumbersome connector cables and lower prices, most gamers — save the early adopters and tech enthusiasts — will continue to balk.

Companies are busy making VR more appealing to a wider audience, and hardware prices are dropping. But even when those hurdles are cleared, the fact that the typical VR experience is so socially isolating might limit its upside.

"[VR] is a solitary experience. It's a thing that you're doing on your own and it's a thing that you choose to do to the exclusion of anything else," Mack

said. He enjoys playing VR games, but if someone else is around, he thinks twice before strapping the headset on.

Though he recognizes the limitations, Mack remains optimistic about VR's future.

"VR, I think, will remain niche, but it could potentially turn into a big niche," he said. "I think we're going to see some very impressive stuff and very compelling stuff come down the pipe in the next couple of years."

Mitu Khandaker, a professor at New York University's Game Center, is hopeful about VR's role in gaming, she said in a 2020 interview with Built In. Khandaker just doesn't think it's going to look like people alone in their homes playing through a headset, so much as a co-located experience that multiple people share in.

"I think that the future of VR is more through social VR," she said.

Indeed, several VR games — such as Rec Room and VRChat — offer social experiences where users can interact and hang out with each other in real time. If VR unlocks more connections with other people, it will be able to earn a prominent place in the future of gaming.

Augmented reality (AR), a kind of gaming technology that superimposes digital images onto the physical world, typically through smartphones or special glasses, broke out onto the gaming scene in a big way in 2016.

That's when parks and plazas swarmed with smartphone-wielders playing *Pokémon Go*, an AR mobile game in which digital objects — in this case, colorful critters called Pokémon — overlay a person's natural field of view. The game, which has generated approximately $1 billion in sales

every year since its release, was most people's first brush with AR and remains one of the technology's biggest success stories.

But the long-term success of *Pokémon Go* is due only in part to its beloved intellectual property. There are plenty of other games and books and movies in which people can spend time with Ash Ketchum and Pikachu. The real secret sauce is the game's blend of virtual and real, the interplay between digital characters and physical locations.

That's partly why AR took off faster than VR: People have an appetite for games that interact with reality, not remove them from it.

"I think the entertainment experiences in AR aren't going to try to be immersive experiences," Mack said. "When I was playing [*Pokémon Go*], I would go to specific places just because there was a Pokémon there. And that's a powerful social driver."

Further out into the neighborhood — rather than deeper inside goggles — was the x-factor that led to the network effect that propelled *Pokémon Go* into a multi-billion-dollar phenomenon. Its success will no doubt inspire more game studios to try to capitalize on the consumer demand for games that blend the virtual with the real.

"I could totally see a game where you're playing hide-and-seek or some kind of laser tag," Mack said. "It's a natural fit at that point."

Rogelio Cardona-Rivera, a professor at the University of Utah's School of Computing, likewise predicts that, in the short term at least, AR will prove to be more fertile ground for game designers than VR.

"Instead of trying to simulate reality altogether, I think designers might find complementing reality a more trackable design challenge," he told

Built In in 2020. “And then we might see some of the lessons from AR folded back into VR.”

AR gaming is most recognizable on mobile phones, but tech companies like Meta, Snap and Magic Leap are expanding into AR glasses. Magic Leap’s lightweight, glasses-style headset is specifically made for enterprise applications like healthcare, design and manufacturing. Although Snap’s Spectacles are not actually for sale, they are available to select creators looking to test them out. With Meta expected to release its own AR glasses in 2024, there are sure to be new innovations for gamers interested in AR in the coming years.