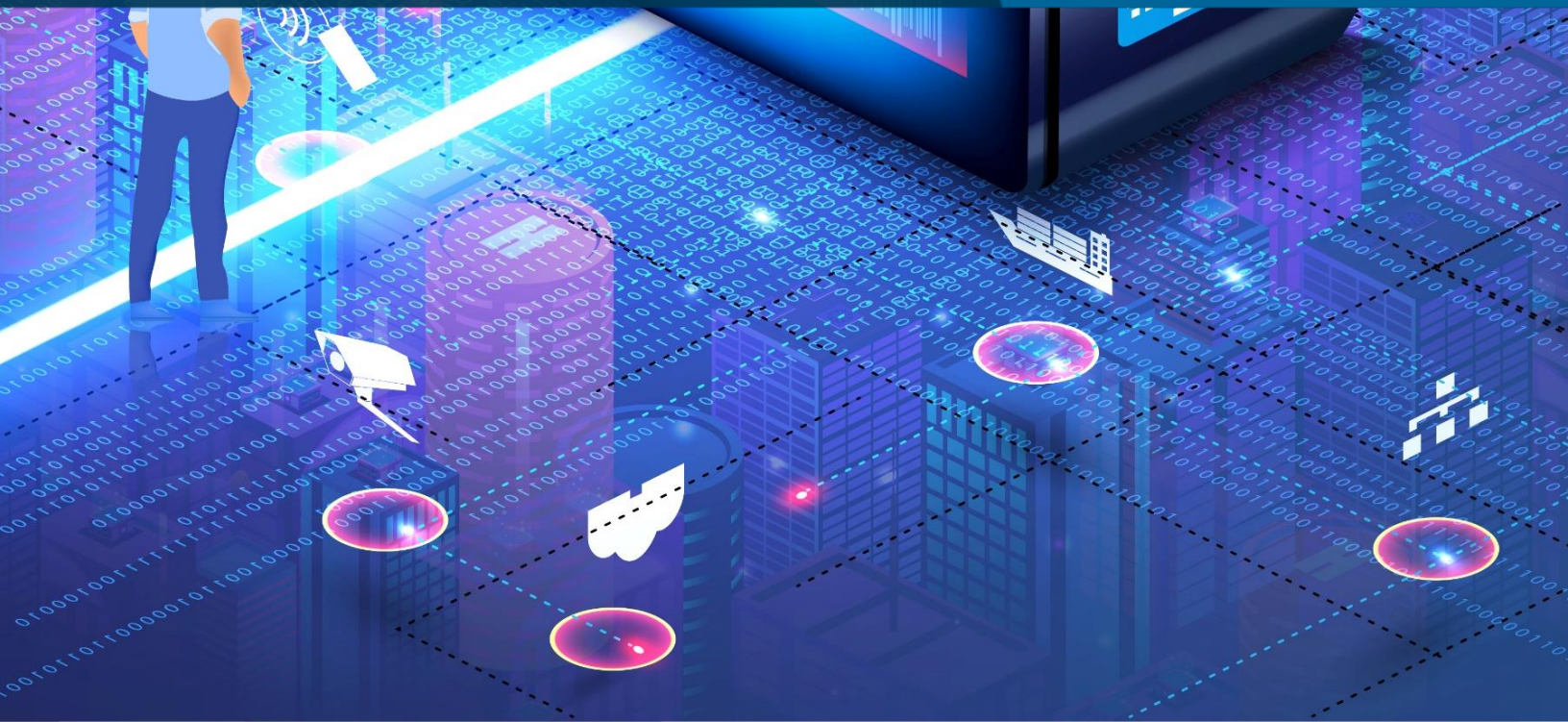




Uncovering the possibilities of XR with Nikolaos Tzoumerkas

by Olivia Lowden



XR is a catchall term that refers to virtual reality (VR), augmented reality (AR), and mixed reality (MR), three technologies that – although in varying ways and to different degrees – help immerse an individual in virtual spaces. There’s been no shortage of hype surrounding XR, and now, the industry appears to be at something of an inflection point. Beloved tech giant Apple recently entered the arena, which has shaken up the market and sparked a new wave of curiosity.

“After a spell where much of the noise surrounding XR subsided, Apple’s recent announcement has reignited consumer awareness,” says Nikolaos Tzoumerkas, Futuresource Consulting’s resident expert in XR. “The wheels are still turning for the industry, and the renewed consumer enthusiasm is prompting new developments across the board.”

As a market analyst, Tzoumerkas spends his working hours deepening his understanding of the burgeoning technology, considering how it will affect markets, industries, and ultimately, the world.



"AS TIME GOES ON, XR WILL GAIN TRACTION IN EDUCATION, MEDICINE, AND ENTERPRISE."

“So far, a lot of the buzz has been around gaming and entertainment. We had PokemonGo! that introduced AR to a mass audience, and Meta, which has spoken very publicly of plans for a social-media-orientated ‘metaverse’. But as time goes on, XR will gain traction in education, medicine, and enterprise,” he says.

“VR is helping autistic children combat their phobias and anxieties by exposing them to their triggers in a safe environment. They’re practicing social skills and experiencing a sense of freedom difficult to attain in their actual lives. As a piece of consumer technology, VR is helping people feel truly included.”



**NIKOLAOS
TZOUMERKAS
MARKET ANALYST**

From streamlining the way businesses train their staff, to providing disadvantaged students with opportunities to explore otherwise inaccessible locations, XR contains enormous possibilities. While the timeline for XR undoubtedly stretches far into the future, Tzoumerkas points out that the technology's history also goes back further than we think.

"XR isn't a twenty-first-century concept. It's been the subject of science-fiction plotlines and technology development for decades. Recently, there's been some talk of generative AI taking away from XR, but XR has a rich history, and it's more helpful to consider the two technologies as having a symbiotic relationship, with advances in one sector helping propel the other.



"Foveated rendering, for example, uses AI to follow a user's eye movement. Where the eyes are focused, the resolution of the image becomes clearer, helping render smooth images within virtual reality. The first VR headsets caused users to feel nauseated, but advances in foveated rendering have helped resolve that."

The use cases of AI in XR will only expand. AI will be used in the production side of things, to create 3D environments from single photographs. Meta intelligence – when combined with VR – can make humans more productive, providing feedback on product designs for predictive danger avoidance.

XR seems on the brink of take-off, but Tzoumerkas highlights that there's still some way to go. For consumers to want to adopt XR, the hardware needs to be lightweight and user-friendly.

"Computer-vision-enabled XR requires a tonne of processing power, which makes it expensive and bulky to integrate into headsets. If we see a pair of lightweight AR glasses, it's a clear giveaway they're lacking in specs. The industry is still finding the balance between power and functionality, but the solution to these issues is being increasingly found in the new generation of energy-efficient chipsets."

"THE INDUSTRY IS STILL FINDING THE BALANCE BETWEEN POWER AND FUNCTIONALITY"

Qualcomm's recent announcement of the Snapdragon XR2 Gen 2 represents another step towards a standard model of XR. The chip is specifically designed for AR and will go a long way in making processing more efficient. But the hurdles don't end there.

"The other missing piece for XR is related to wireless internet. 4G is currently the dominant wireless network technology, but it doesn't enable XR to unlock its full potential. The higher bandwidth that 5G brings will help stop lags in VR and cut the data processing time. Plus, it will allow the industry to implement AI into XR in a more meaningful way. For now, we're waiting for 5G to become widespread. With 6G expected to arrive in 2030, opportunities for XR will increase," says Tzoumerkas.

As well as striking the balance between power and functionality, price point is also an important and largely untested area for developers. Apple's forthcoming mixed reality headset – the Vision Pro – starts at \$3,499. The headset uses hand-tracking technology and appears to be comfortably ahead of the rest of the market.

"If the headset delivers on its promises, it will certainly be a technological feat. But when you consider the price and two-hour battery life, the trade-offs become more evident," says Tzoumerkas. "Regardless, it will be a good way to gauge what consumers are willing to pay.

"It's undoubtedly a timely launch," he continues. "Consumers are comfortable with the concept of XR, and the Apple brand is widely trusted and hugely popular. It will be interesting to see how the product performs. Meta, which is by far the biggest player in the space, recently announced the Meta Quest 3 headset, priced at a competitive \$499.99. Both Meta and Apple's announcements are sparking more awareness and will encourage more brands to enter the space."

"FROM A CONSUMER PERSPECTIVE, THERE'S ANOTHER BIG CONCERN: DATA."

Awareness is at an all-time high, and a slew of products are entering the market. While brands are focusing mostly on entertainment use cases, these forays will pave the way for the use of XR in enterprise and education. "It's all a matter of time," says Tzoumerkas.

There are technological hurdles for XR developers to overcome. But from a consumer perspective, there's another big concern: data. The world is powered by it, and XR provides companies with yet another opportunity to obtain consumer information, with a user's unique movements and specific gestures all at risk of being processed. As technology advances, the privacy issue only deepens.



"The Vision Pro will use a new security technology called Optic ID to secure data from external users. The device will scan your iris, which is unique to every person, to unlock it. While your data may be secured from the average person, is it secured from the company itself? Apple has hinted they won't process your data at all, but until the privacy statement is released, it's difficult to prove how accurate this is."

"Different brands have varying levels of privacy, but with VR, the risk is more extreme. It's an ongoing issue and will hopefully be finetuned as awareness increases."

Tzoumerkas is clear to emphasise the unpredictable nature of the XR industry. This makes the future difficult to comment on.

"What we can say is that the next ten years will bring huge developments for XR. As AI advances and stronger chipsets come along, XR will become more powerful and accessible. Apple is expected to lead the way in the second phase of acceleration of XR, which will help bring this technology into the mainstream."

For information about our research into XR markets, contact leon.morris@futuresource-hq.com

"XR WILL BECOME MORE POWERFUL AND ACCESSIBLE"



NIKOLAOS TZOUMERKAS
MARKET ANALYST

Nikolaos Tzoumerkas is a Market Analyst in the Consumer Electronics team at Futuresource Consulting. Having joined in January of 2023, his main research focus includes the segments of wearables, where he tracks smartwatches and sports watches among others, and XR where he tracks all the major types of hardware technology. Nikolaos has also worked on tablets and smartphones giving him a holistic overview of the personal electronics sector.



OLIVIA LOWDEN
CONTENT, PRESS & PARTNERSHIP EXECUTIVE

Olivia Lowden is responsible for the long-form content, press, and partnerships at Futuresource. Prior to her career at Futuresource, she completed an MA in Creative Writing at the University of East Anglia, demonstrative of her lifelong love of words.