

AR/VR/XR INDUSTRY



Whenever someone talks about the top technological trends that will shape the future, Augmented and Virtual Reality always makes it to that list. VR is the use of computer modelling and simulation that enables people to interact with an artificial 3-D visual or any other type of sensory environment.

On the other hand, AR provides a real-world interactive experience in which objects and environments in the real world are enhanced by computer-generated image features. Multiple modalities are a part of this experience including auditory, visual, haptic, olfactory, and somatosensory. To put it in simple layman's terms, augmented reality is the combination of the real and

virtual world in which users are allowed to interact in real-time with virtual elements. Lastly, XR or extended reality is more of an umbrella term that accounts for all immersive technologies that occur due to the blending of virtual and real worlds.

However, the newest buzzword that is pushing the use of these technologies to even greater heights is the Metaverse. Coined in 1992 by author Neal Stephenson in a science-fiction novel to describe a virtual-reality-based successor to the internet. In simple terms, the metaverse is a shared virtual environment that people can access via the internet and one that uses a combination of AR and VR.

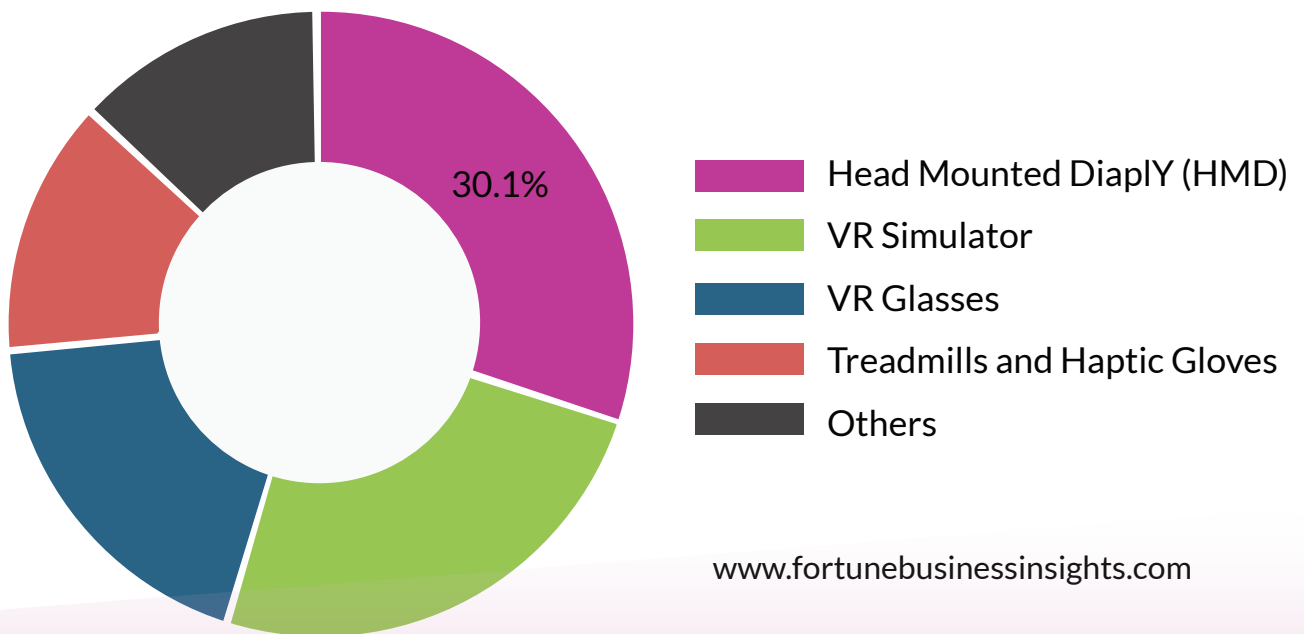


Global Outlook for the AR/VR/XR Industry

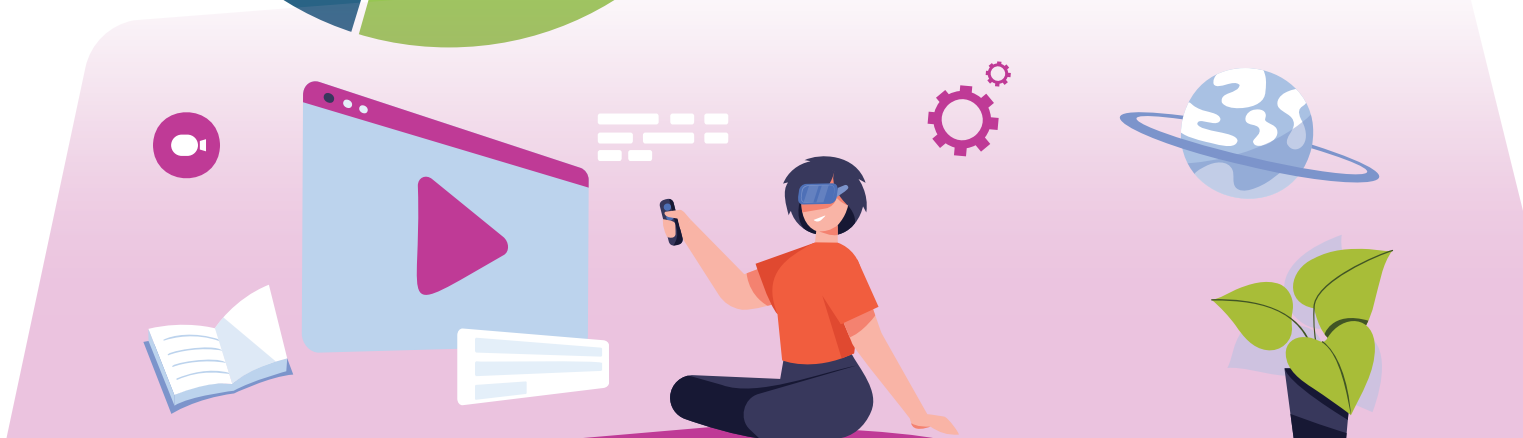
According to a market research study, the market size and share revenue for the global Augmented Reality market are estimated to grow to about \$90 billion by 2028, with a CAGR of approximately 31.5% between 2022 and 2028.¹ While the value stood at \$15.2 billion in 2021, it's only expected to grow more as some of the world's biggest companies start adopting AR Technology.

As for the VR market, it is expected to reach \$84.09 billion by 2028 with a CAGR of 44.8%.² When it comes to the metaverse, VR is the gateway to its profit potential. The global market for the Metaverse could reach \$1.6 trillion by 2030 with a CAGR of more than 45% over the next eight years and a value of \$62.1 billion in 2021.³

Global Virtual Reality Market Share, By Device Type, 2021⁴



www.fortunebusinessinsights.com



⁴ <https://www.globenewswire.com/en/news-release/2022/06/28/2470583/0/en/Global-Opportunities-in-Augmented-Reality-Market-Size-Will-Grow-Over-US-90-8-Billion-by-2028-at-31-5-CAGR-Growth-AR-Industry-Demand-Share-Trends-Statistics-Key-Players-Segments-Ana.html>

² <https://www.globenewswire.com/en/news-release/2022/04/18/2423750/0/en/With-44-8-CAGR-Virtual-Reality-Market-Size-Will-Reach-USD-84-09-Billion-in-2028.html>

³ <https://money.usnews.com/investing/stock-market-news/slideshows/virtual-reality-stocks-to-watch?slide=2>

⁴ <https://www.fortunebusinessinsights.com/industry-reports/virtual-reality-market-101378>

Drivers of growth

Growth in this sector is not only driven purely by the entertainment value that AR/VR/XR technology provides, but also by its applications in a number of different sectors. Demand only continues to grow for 3D imaging in the healthcare sector which has led to a significant increase in demand for AR devices. Besides the health sector, other industries like retail, automotive, and architecture are increasing their reliance on AR software to provide value-added services to their clients.

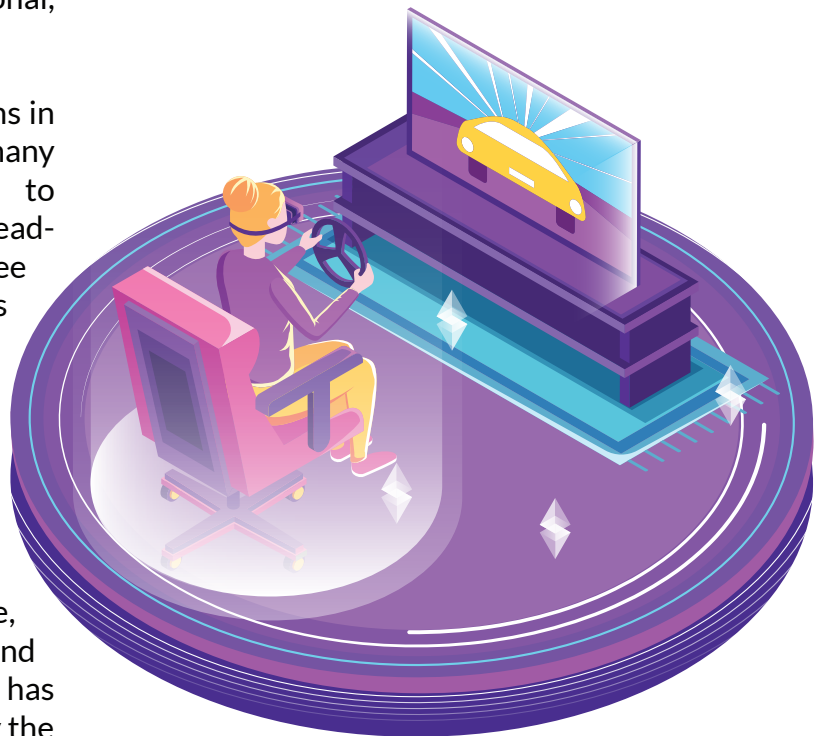
Gaming has become much more interactive and immersive using AR and VR technology. Moreover, AR and VR are also being used to boost engagement between digital content and viewers. This marketing method proved to be extremely useful during the pandemic as digital connections took precedence in all avenues including personal, professional, and entertainment.

AR/VR tech has also found applications in the manufacturing sector with many companies using the technology to improve maintenance. AR-based head-mounted displays and 360-degree cameras offer views where there is limited visual awareness. VR has also proved to be helpful for training as VR-based flight simulators provide realistic training to pilots.

Virtual trainings are seeing heavy investments from a myriad of different sectors including automotive, education, healthcare, aerospace, and military. Lastly, the retail sector has already seen a huge transformation by the

integration of AR/VR tech by allowing consumers to virtually try on things without leaving the comfort of their homes. The growing popularity of VR can be easily gauged by the fact that the VR gaming industry earned \$1.1 billion in 2020 while 5.5 million AR and VR headsets were shipped by manufacturers in the same year.⁵

As for the applications of the metaverse, they're endless if you think about it. Not only does it create a unique gaming experience but it can help people with all sorts of different experiences together. People can attend virtual concerts, visit any place they want from the comfort of their home, and make money through a virtual social economy via NFTs and cryptocurrencies. Moreover, the metaverse can be used for teaching, training, and a myriad of other things.



⁵<https://dataprot.net/statistics/virtual-reality-statistics/>

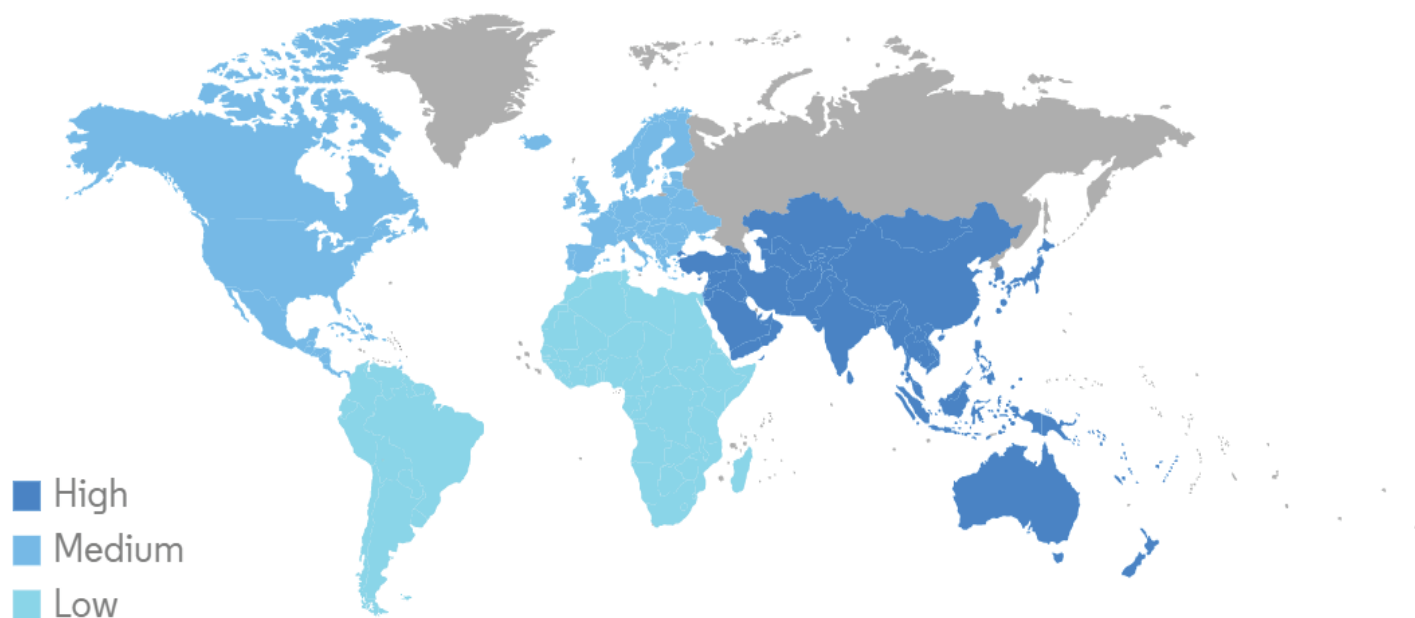
Who is leading the market?

While every company is trying to jump on the bandwagon by integrating AR/VR/XR in their offerings, the market has been captured already by a few key players like Sony Corporation, Niantic, Inc., Google LLC, Blippar Limited, Magic Leap, Incorporated, Apple, Inc, etc. If we look at a regional breakdown, North America dominates the market because of the increasing demand for AR in e-commerce and retail stores in the region which has led to a growth in investments.

However Asia Pacific seems to be catching up by becoming the fastest-growing region as more and more people adopt AR

technology in gaming and entertainment.⁶ The VR market is also dominated by North America fueled by new startups entering the arena and offering industry-specific solutions. Growth is also being fueled by the US government investing heavily into virtual technology with the US army committing \$11 billion in AR/VR/MR training sessions for government workers.⁷ Key players operating in the VR market include Google LLC, Oculus Rift (Facebook Inc), Sony Corporation, Unity Technologies, and HTC Corporation.

Extended Reality (XR) Market - Growth Rate by Region (2022-2027)⁸



Source: Mordor Intelligence

⁶<https://www.verifiedmarketresearch.com/product/global-augmented-reality-software-market-size-and-forecast-to-2025/>

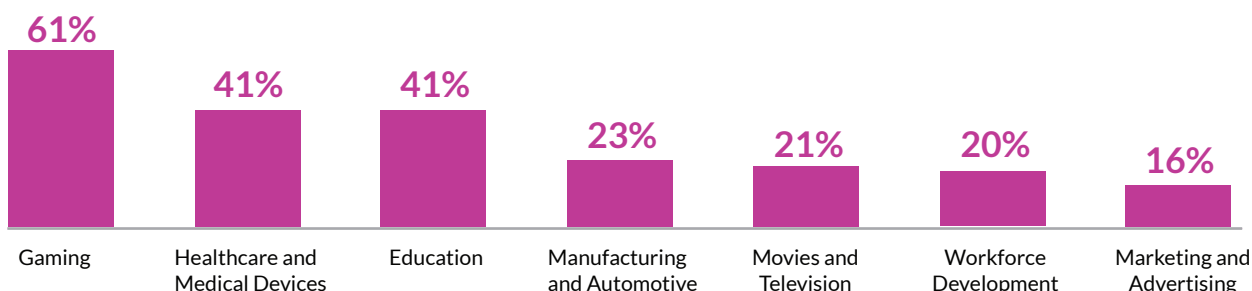
⁷<https://www.globenewswire.com/en/news-release/2022/04/18/2423750/0/en/With-44-8-CAGR-Virtual-Reality-Market-Size-Worth-USD-84-09-Billion-in-2028.html>

⁸<https://www.mordorintelligence.com/industry-reports/extended-reality-xr-market>

You can't talk about the Metaverse market without talking about Meta formerly Facebook which has invested more than \$10 billion in the sector. Besides the heavy investment, Meta also bought the best-selling game Oculus in 2014 and saw the profits reap in 2021 when the Oculus Quest 2 headset became the best-selling VR headset of 2021.⁹ Other companies in the arena include Roblox Corporation which has invested a significant amount of money in manufacturing tools to be used in the metaverse, Apple which will be introducing glasses to enter the virtual headset arena, and Nvidia Corporation amongst others.¹⁰



In which industries if VR most useful?¹¹



Augmented Reality Unicorns

Name	Valuation	Country
Niantic	\$9 billion	United States
Anduril	\$4.6 billion	United States
Rec Room	\$3.5 billion	United States
Magic Leap	\$2 billion	United States
Hailo	\$1 billion	Israel

⁹<https://money.usnews.com/investing/stock-market-news/slideshows/virtual-reality-stocks-to-watch?slide=2>

¹⁰<https://www.thenews.com.pk/print/959168-metaverse-for-pakistan>

¹¹<https://financesonline.com/virtual-reality-statistics/>

Zooming in on Pakistan

Though immersive technology is gaining traction in Pakistan at a steady rate, the country has been a little slower compared to its counterparts in wholly embracing this new wave of technology. The country saw its first brush with a VR startup when Aiyin, an Islamabad-based ed-tech startup became the runner-up in the GlobalMakerChallenge and won Rs.1.65 million.

The startup allowed students to access science labs using their tech. While the idea was a great one that could have achieved a lot of traction had it been formulated today, in 2020 it did not achieve the results it wanted.¹² With the overall community much more receptive to AR/VR tech now, companies using this technology have been flourishing with 2022 seeing two AR/VR companies raise impressive rounds of funding. The first Orbit-Ed, a female-led venture started by using AR to redefine classroom learning. To that effect, they recreated school curriculums in interactive smartphone applications.

However, they soon pivoted from using AR to teach children to use the same technology to conduct training when their own poor training protocols were pinpointed as the reason behind falling sales. Now with a new round of fundraising that brings their total funds to \$800K, they aim to use their learning technology to revolutionize the world of training and learning.^{13,14} The second called EuphoriaXR, an extended-reality development studio recently raised funding for its product InterApp which aims to bring mass adoption of AR to Pakistan.¹⁵

Besides EdTech, the XR industry is also making leaps and bounds in the healthtech sector. In November 2021, Ziauddin University introduced Pakistan's 1st VR dental simulator known as Virteasy Dental. The tool was installed at the digital dental lab at the School of Dentistry.¹⁶ VR was also used in a study by Pakistani scientists to show how the technology could be used to control or slow down the decline in brain functions of dementia patients. They harnessed the power of virtual reality to make virtual surroundings more complex, dynamic and challenging than the actual environments of dementia patients in order to simulate their brains.¹⁷



2022 also saw Foodpanda using virtual reality to introduce a new system for onboarding talent in Pakistan. The delivery giant used VR glasses to give students a feel

¹²<https://www.techjuice.pk/mit-backs-pakistani-virtual-reality-startup-aiyin/>

¹³<https://educations.pk/blog/2020/07/10/orbit-is-here-with-the-best-interactive-study-method-to-keep-your-kids-learning-in-the-lock-down/>

¹⁴<https://founderpakistan.com/orbit-ed-raises-500k-pre-seed-round-led-by-boost-vc/>

¹⁵https://www.linkedin.com/posts/euphoriaxr_ar-interapp-metaverse-activity-6960206576179642368-aT69?utm_source=linkedin_share&utm_medium=member_desktop_web

¹⁶<https://www.dentalnewspk.com/27-Nov-2021/ziauddin-university-introduces-pakistan-s-first-vr-dental-simulators>

¹⁷<https://www.arabnews.pk/node/1930426/pakistan>

of the Foodpanda workplace during its many job fairs held in numerous universities in Karachi.¹⁸ The VR market saw another uptick in Pakistan when Digisol announced its partnership with Zero Density as a channel partner. Zero Density which has a cutting-edge virtual studio and AR solutions will give an edge to TV Broadcasters, media production houses, content generators, and other institutions in Pakistan.

Tourism has also been a sweet spot for the VR industry with many using virtual reality to give their customers a feel of different locations before they make the trip in person. Companies like Virtual Pakistan are selling interactive aerial tours while HD360 creates virtual tours on demand.^{19,20} The tours are not relegated to broad views of cities only though. HD360 has also created dozens of virtual tours for factories, educational institutions, housing societies, etc.²¹

The concept of metaverse has also been picking up in Pakistan, with the country entering one of the most famous decentralised metaverse platforms through the aid of Mudassir Ali and Umair Mustafa who created a 3D view of Faisal Masjid in the Decentraland Metaverse. Decentraland which allows users to buy virtual properties as NFTs is considered to be one of the biggest metaverse platforms and the currency used there ranks as the biggest metaverse currency with a market cap of around \$4.5 billion.²² Gaming and software houses are also increasingly getting into the creation of Metaverse games.

EdTech	WonderTree, OrbitEd, DigiPaint
PropTech	mimiAR, Mapalytics, Homevism
Software Houses	Euphoria XR, DigiTrends, GroCode, Origami Studios, Elytra Studios, Naisky, RenderLounge, PIXARCH, TechoStudios, MangoTech, HD360, Haider Solutions 360, Darul Solutions
Entertainment	Vrhere, Transfinity, Moshpit
Gaming	Kiwi Creations, Naisky, Portsea Games, Mixeal, Narsun Studios
HealthTech	Haptch
E-commerce	Brandverse
	Virtual Pakistan
	Metaverse Pakistan, AurLab, Exarta, CloudCity Metaverse,

¹⁸<https://propakistani.pk/2022/03/22/virtual-reality-catalyzing-the-future-of-how-talent-is-onboarded/>

¹⁹<https://virtualpakistan.pk/tourism-vr/>

²⁰<https://www.hd360.pk/>

²¹<https://www.haidersolutions360.com/index.php>

²²<https://propakistani.pk/2022/03/24/pakistans-first-complete-3d-view-of-faisal-masjid-has-been-placed-in-decentraland-metaverse/>



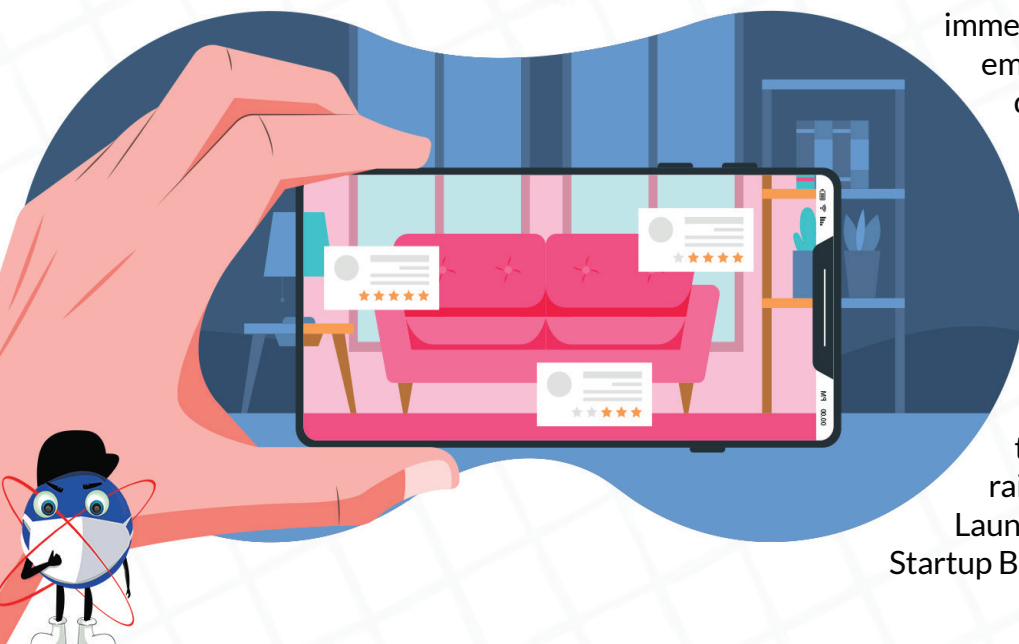
WonderTree

WonderTree is an Augmented-Reality startup aimed at children that require special education. They produce games that help enhance children's motor, cognitive, and educational skills. They have a user base of more than 6500 children and their gaming solutions are being used in 19 hospitals, 57 schools, and 187 houses.²³ The startup was a recipient of the UNICEF Innovation Fund 2020 for its inclusive and unique approach to using motion-based games as an assistive tool for children with health impairments. Besides the Innovation Fund, WonderTree was also selected by Google for its accelerator program which focused on sustainable development goals.²⁴



Orbit-Ed

Orbit-Ed provides enterprises with a VR platform to optimise the learning and training of their employees. From effective training sessions, to evaluating performances, and predicting learning outcomes, Orbit-ed has it all. They create close-to-life immersive experiences for enhancing employee engagement. Their data-driven training results in increased productivity and organisational agility.²⁵ Besides enterprises their gamified learning platform is also used for K-12. The startup recently announced its pre-seed round in August 2022 led by Boost VC which brings up its total funding to \$800,000. They previously raised funding from the Learn Launch Fund+Accelerator as well as Startup Bootcamp.²⁶



²³<https://wondertree.co/>

²⁴<https://tribune.com.pk/story/2258899/pakistani-startup-wondertree-picked-by-google-unicef-for-investment>

²⁵<https://www.orbit-ed.com/>

²⁶https://www.crunchbase.com/organization/orbit-ed/company_financials

mimAR

mimAR specialises in all aspects of 3d architectural visualisation rendering services through augmented reality and virtual reality. Besides providing architectural design services, the company's marketing experts also help with the selling and branding of the real estate project. They use AR and VR technology to help visualise buildings before they are built. The added features include mixed reality that allows the design to be viewed on the actual site with real-time context and interactions that let clients choose amongst furniture and fixtures making it a customer-centric design.²⁷

EUPHORIA XR

Euphoria XR

Euphoria XR is a creative technology company that produces next-generation experiences for world-class brands. They are best known for their award-winning work in AR (Augmented Reality), VR (Virtual Reality), and AI (Artificial Intelligence) application development. Their clientele list includes Hasbro, Qatar Airways, TXDOT, TTEC, Ducati, NFL, Total, Nestle, and Pepsi amongst others. They not only develop AR VR apps but have also created 360 VR commercials and CG environments for numerous brands.²⁸ Euphoria product InterApp recently raised a \$1.2 million funding round in August 2022. The funding is going to be used for the mass adoption of AR technology in Pakistan.²⁹



RENDER
LOUNGE

RenderLounge

Renderlounge is a firm focusing on photo-realistic architectural visualisations and the incorporation of Virtual Reality into their projects. They aim to be the top rendering and visualisation company in Pakistan with ambitions to make a mark in the international market as well. The company focuses on interior and exterior visualisations including landscape and large-scale industrial visualisation. Renderlounge incorporates Real-time iterative design utilising the latest in simulation engine technologies. They have been the recipients of numerous awards and grants including the EPIC mega grant, the APAC Insider 'Most innovative experience provider' award, and the best 'Architectural Visualisation Studio' award.³⁰



Elytra Studios

Elytra Studios is an Interactive AR/VR and Gaming studio. Their list of clients includes some pretty big names in the industry like Marvel, DC, Pepsi, Doctor Who, Midas Safety, Total, and Ambani amongst others. They leverage immersive technologies (AR, VR, MR) to present content engagingly design novel hardware supporting extended reality, and provide VR and AR development services to consumer electronics brands looking to fine-tune distributed systems' performance.³¹

²⁷<https://mim.archi/>

²⁸<https://euphoriaxr.com/>

²⁹<https://www.linkedin.com/feed/update/urn:li:activity:6960210032260976640/>

³⁰<https://www.renderlounge.com/>

³¹<https://www.elytrastudios.com/>



Darul Solutions

Darul Solutions is an IT Solution company which excels in web designing and development, software development, E-Commerce, graphics designing, enterprise solution services, Online Media planning and other IT Solutions, which are the core requirements of today's business industries around the world. Their services include real-time walkthrough visualisations, Interactives sales points, 3-D floor plans, 3-D modelling, Virtual Reality Content, Augmented Reality, Photo-realistic renderings and real-estate 3-D visualisations. Some of their notable clients include Hyundai, LNG Studios, Shaikhani Group, Elsa, Suzuki, Proton and ARY Laguna.³²



Virtual Reality

Augmented Reality

Mixed Reality



Kiwi Creations

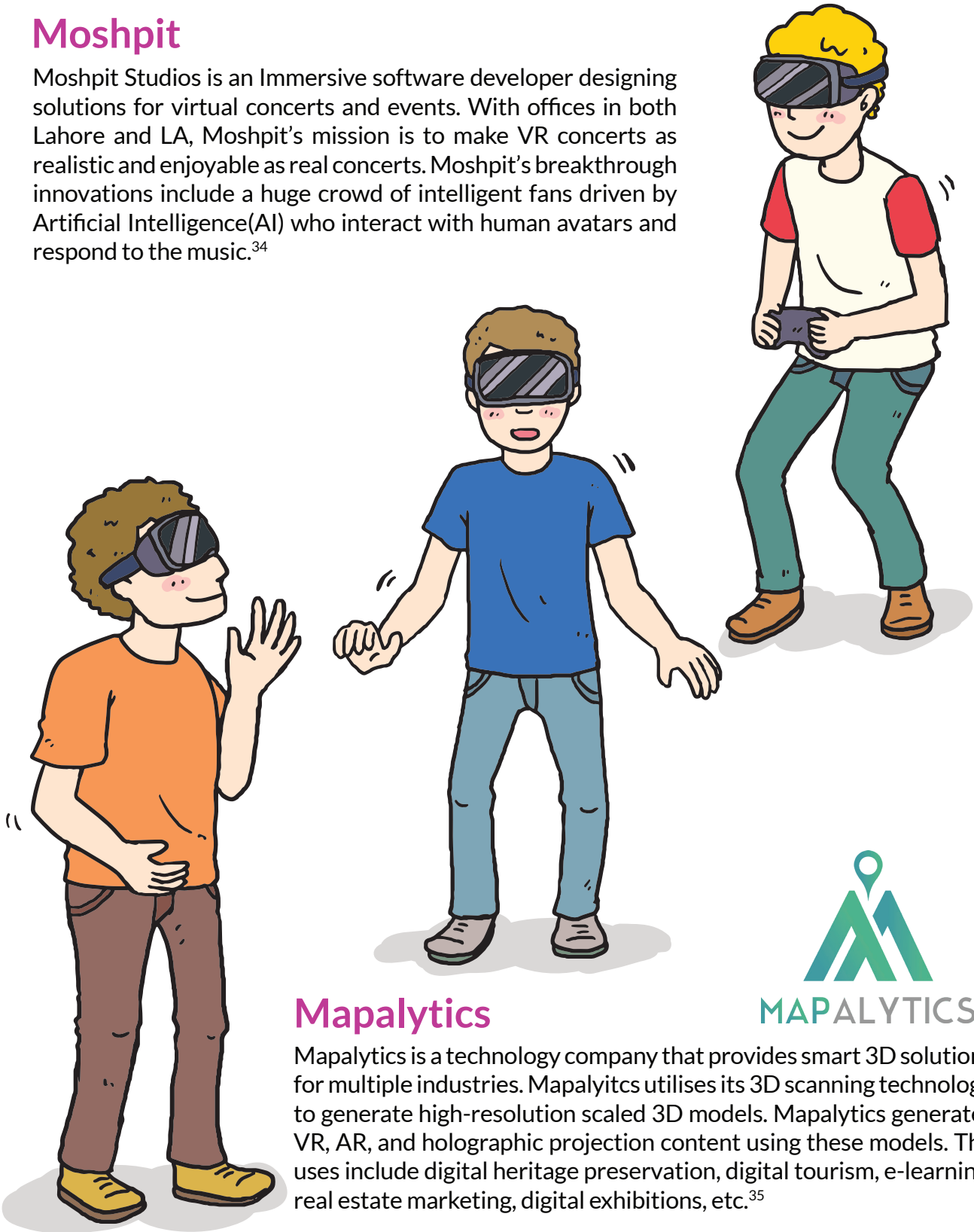
Kiwi Creations is a trusted AR, VR, and game development company. They have created eminent game solutions for entrepreneurs, startups, and Fortune 50+ companies alike. With a 99% job success ratio, they have delivered over 100 projects. Their specialty is the creation of metaverse games.³³

³²<https://www.darulsolutions.com/>

³³<https://kiwicreations.io/>

Moshpit

Moshpit Studios is an Immersive software developer designing solutions for virtual concerts and events. With offices in both Lahore and LA, Moshpit's mission is to make VR concerts as realistic and enjoyable as real concerts. Moshpit's breakthrough innovations include a huge crowd of intelligent fans driven by Artificial Intelligence(AI) who interact with human avatars and respond to the music.³⁴



Mapalytics

Mapalytics is a technology company that provides smart 3D solutions for multiple industries. Mapalytics utilises its 3D scanning technology to generate high-resolution scaled 3D models. Mapalytics generates VR, AR, and holographic projection content using these models. The uses include digital heritage preservation, digital tourism, e-learning, real estate marketing, digital exhibitions, etc.³⁵



³⁴<https://www.moshpit.live/>

³⁵<http://www.mapalytics.org>

DIGIPINT

Digipint

Digipint produces interactive augmented reality books for children. Their unique XR learning technique helps children reduce unproductive screen time and replaces it with learning. Users can use the accompanying app to interact with digital content, sounds, and animations created by the digibook.³⁶



Homevism

Homevism is the next generation of construction. They are working to enhance Pakistan's Development Sector through Augmented Virtual Reality using state of the Art A.I algorithms and 3D technology to turn dream houses into reality. They offer a wide range of services from renderings to interactive designs to marketing strategies for B2B clients and B2C Clients.³⁷



PIXARCH PIXARCH

Pixarch provides exclusive services of Architectural Visualisations, 360 Degree Virtual Walk-through, Photo-Realistic Views, 3D Rendering, 3D Floor Plans, Augmented Reality, Touch Screen Presentation Solutions & Visual Designs. They have delivered over 1000 projects and more than 2000 rendering cores.³⁸

³⁶<https://digipint.com/>

³⁷<https://homevism.com/>

³⁸<https://www.pixarch.net/>



VRHERE

Vrhere is a virtual reality simulation arcade that was a recipient of the USAID SMEA-SMEDA growth grant. They are the first in Pakistan to develop Edutainment Arcades that deliver Entertainment, Educational, and Tourism experiences under one roof. Their venture which started in 2018 has now established arcades in different provinces.³⁹



HD360

Haider-Solutions-360° provides a wide range of I.T, Multimedia, Virtual Reality, and Website Application Solutions and Services. Some of the key solutions which they offer include 360-degree panoramic virtual tours, static and dynamic website design and development, and e-commerce business solutions amongst others. They have created virtual tours for apartment complexes, universities, famous monuments, restaurants, and heritage sites⁴⁰

³⁹<https://vrhere.pk/>

⁴⁰<https://www.hd360.pk/index.php>

TALK TO US



**DO YOU RUN A BUSINESS IN THE
AR/VR/XR INDUSTRY?**

GET IN TOUCH WITH YOUR DETAILS NOW AT

MKT@PSEB.ORG.PK

AND WE'LL TAKE IT FROM THERE.

**ALSO EMAIL US FOR ANY COMMENTS, SUGGESTIONS
OR ERRORS IN THIS WHITEPAPER.**

**FOR MORE INFORMATION ON
REGISTERED COMPANIES, PLEASE VISIT**

[HTTPS://TECHDESTINATION.COM](https://techdestination.com)

ABOUT THIS INDUSTRY ROUNDUP

Pakistan Software Export Board developed this paper by hiring services of independent consulting firms to prepare this roundup on AR/VR/XR Industry. The paper focuses on Pakistan-based companies in this vertical and appraises the reader of the expertise available in Pakistan in the AR/VR/XR Industry domain.

DISCLAIMER

All the information provided in this roundup is compiled by the consulting firms and based on the available material about the companies covered in this roundup. Coverage in this industry roundup document is not an endorsement by Pakistan Software Export Board (PSEB), Ministry of Information Technology and Telecommunication (MoITT) or the Government of Pakistan (GOP). The Pakistan Software Export Board, Ministry of Information Technology and Telecommunication, or the Government of Pakistan assumes no commercial financial or legal liability accruing from any transactions with the firms featured in this industry roundup.

A product of **TECH destiNATION Media**

Comissioned by:



Developed by:

