

AR, VR and XR



Augmented Reality, Virtual Reality, Mixed Reality and Extended Reality



Mapping the Metaverse

Virtual Reality (VR), Augmented Reality (AR), Mixed Reality (MR), and Extended Reality (XR) are immersive technologies that enhance or transform our interaction with digital content. While they are often discussed together, each has unique characteristics and applications that set it apart.

VR is a fully immersive experience that transports users into a digital environment, shutting out the physical world entirely. Using headsets and sometimes other sensory inputs like gloves or motion trackers, VR creates a digital space that feels separate from the real world.

VR is popular in gaming, where players can explore 3D worlds as though they are actually present within those worlds for example Beat Saber or Half-Life: Alyx. VR is also used in training simulations, like flight simulators for pilots and surgical training for medical professionals, providing a safe, controlled environment for learning complex skills.

AR overlays digital content onto the real world. Unlike VR, AR does not create a fully immersive environment; instead, it enhances the user's view of her/his actual surroundings with virtual elements.



AR is widely used in mobile applications. Examples include Pokémon GO, which overlays digital creatures onto real-world settings through a phone's camera, and IKEA Place, which allows users to visualize how furniture would look in their home by placing 3D models of products into their space through their device's camera.

MR combines elements of VR and AR, allowing real and digital objects to interact. In MR environments, digital content is not only layered over the physical world (as in AR) but users can also interact with it in real-time.

MR is used in collaborative workspaces and advanced design. For example, Microsoft's HoloLens allows engineers and designers to manipulate digital 3D models as if they are physically present, supporting real-time collaboration on designs that integrate both digital and physical elements.

XR is an umbrella term, extended reality, that encompasses VR, AR, and MR. It refers broadly to any technology that combines real and virtual environments to create immersive experiences.

XR is commonly used in education, retail, and healthcare, where diverse immersive technologies can be applied depending on the need. For instance, in education, XR can allow students to experience historical events in VR, view 3D anatomical models in AR, and use MR to simulate interactions between virtual objects and physical surroundings.

The metaverse is a shared, persistent digital environment that combines aspects of VR, AR, MR, and XR into a continuous, interconnected experience. It aims to be an immersive, collective virtual space where people can interact with digital elements and each other in real time, much like in a physical world. Unlike VR or AR experiences that may be isolated or self-contained, the metaverse is envisioned as an expansive, interlinked digital universe with various experiences, environments, and worlds that users can seamlessly navigate.

I think AR is a profound technology that will affect everything. Imagine suddenly being able to teach with AR and demonstrate things that way. Or medically, and so on. Like I said, we are really going to look back and think about how we once lived without AR
- Tim Cook, CEO Apple¹

¹ Huddleston Jr., T. (2022). Apple CEO Tim Cook doesn't like the metaverse—he predicts a different technology will shape the future. CNBC. Retrieved from <https://www.cnbc.com/2022/10/03/apple-ceo-tim-cook-doesnt-like-metaverse-prefers-augmented-reality.html>



Augmented reality (AR) and virtual reality (VR) are gaining traction, particularly in the gaming industry, education, the retail sector, and physical fitness. AR-based activity-oriented game Pokémon GO took the world by storm when it debuted. Consumers can use AR to see how products will look in their homes before buying. For example, IKEA Place allows users to virtually place objects in their real-world environment. AR apps can add rich new content to tourist applications and navigation aids.

VR fitness apps like Supernatural and Fit XR allow users to take part in immersive fitness classes from home. VR is also used in surgical operations, oncological treatments, psychological therapies, diagnoses, and preventive assessments. The military uses VR in training to improve the skills and capabilities of armies. Virtual reality tours have started to catch on.

The AR and VR market is expected to generate revenues of USD 40.4 billion in 2024 with a user penetration rate of 52.8%.² The largest segment in the current market is due to AR software, with an estimated market volume of USD 13 billion. The United States leads the numbers for revenue generation in 2024 with a projected market volume of USD 10.9 billion. It is estimated that this market will grow at an annual rate of 8.97% for the next five years, resulting in a projected market cap of USD 62 billion by 2029 and a number of 3.728 billion AR and VR users.

“When we get to this [AR] world, a lot of the things we think about today as physical objects, like a TV, will be \$1 apps in an AR app store”
 – Mark Zuckerberg, founder of Facebook

² AR & VR - Worldwide | Statista Market Forecast. (2024, April). Retrieved from <https://www.statista.com/outlook/amo/ar-vr/worldwide>

Leading International Players

A hotly contested race is underway to capture the metaverse market, featuring well-known technology giants from the US (Meta, Apple) and Asia (ByteDance, Sony, HTC Vive).



Meta recently published financial statements revealing that the company spent USD 4.3 billion in the first quarter of 2024 on Reality Labs, the company's business and research unit that develops and produces VR headsets like the Meta Quest 3.³ Meta has seen 37% YoY growth in Q2 2024 and has currently captured 80% share in the global VR headset market.⁴

Apple recently launched its Vision Pro headset in February 2024.⁵ Top industry executives term Apple's entry into VR with its new headset as a 'watershed moment.' The headset introduces spatial videos and spatial photos, features immersive environments, and doubles as a high quality 3D personal media player.

Sony, developer of the renowned PlayStation gaming platform, announced plans earlier to invest 300 billion yen (USD 2.13 billion) into metaverse research and development for the fiscal year ending in March 2024. The amount, which will account for around 40% of Sony's total R&D spending, now surpasses its spending in electronics and semiconductors.⁶



³ Edser, A. (2024). Meta spent \$4.3 billion on its VR division in three months, and made "checks figures" \$440 million in return. Yahoo Finance. Retrieved from <https://finance.yahoo.com/news/meta-spent-4-3-billion-162942740.html>

⁴ Global XR (AR & VR Headsets) Market Share: Quarterly. (2024, September). Retrieved from <https://www.counterpoint-research.com/insight/global-xr-ar-vr-headsets-market-share-quarterly>

⁵ Sag, A. (2024). Apple Vision Pro: A Beautiful, Flawed Bridge To The Future. Forbes. Retrieved from <https://www.forbes.com/sites/moorinsights/2024/02/15/apple-vision-pro-a-beautiful-flawed-bridge-to-the-future>

⁶ VR/AR Association (VRARA). (2024, September 07). VR/AR Association (VRARA). Retrieved from <https://www.thevra.com/blog/2023/7/14/sony-investing-2b-into-xr-metaverse-research-and-development>



AR, VR, and Metaverse: The Landscape in Pakistan

While immersive technology adoption in Pakistan has been relatively slower, the sector is gradually gaining traction. Statista reports that the projected value of the metaverse market in 2024 is estimated to reach USD 230.1 million.⁹ A steady annual growth rate of 39.13% is forecast over the next few years, resulting in a projected market volume of USD 1.7 billion by 2030.

Pakistan's VR journey began with Aiyin, an Islamabad-based Edtech startup that provided virtual science labs, securing recognition in the Global Maker Challenge.¹⁰ Today, companies in Pakistan's AR/VR space are flourishing, as in the case of Orbit-Ed, a female-led company, which is reshaping interactive learning and training.

In healthcare, XR technology has made strides over the years: Ziauddin University introduced the country's first VR dental simulator. Research has shown VR's potential for supporting dementia patients by creating engaging, cognitive-stimulating environments. A Pakistani startup, WonderTree builds interactive

games for children with special needs, to facilitate education and therapy.¹¹

Companies like Foodpanda are also utilizing VR for talent onboarding, offering immersive job previews to prospective employees.¹² This initiative is already reporting impressive results: closing 89% of identified knowledge gaps, with 93% of trainees feeling confident in their knowledge after completing the curriculum.¹³

VR is further transforming tourism, with firms like Virtual Pakistan and HD360 offering virtual tours of Pakistani landmarks. Additionally, Pakistani developers are exploring the metaverse, exemplified by Mudassir Ali and Umair Mustafa's creation of a 3D model of Faisal Masjid within Decentraland, allowing users to experience this iconic landmark virtually.¹⁴ The historic Minar-e-Pakistan monument has also been brought to the metaverse by Eventcombo,¹⁵ enabling a 360-degree panoramic view. Situated in Lahore, this iconic monument features a combination of modern and Mughal architecture.

HTC Vive and Epic Games have announced a new USD 3.5 million funding round for Wevr,⁷ a development and production studio that has launched a variety of VR experiences based on some of the world's most beloved brands and talents, including Harry Potter, Run the Jewels, Jon Favreau, and more. The new investment comes as Wevr significantly expands its Virtual Studio technology and real-time 3D production capabilities, enabling them to

continue building immersive, compelling experiences for fans.

ByteDance, the Beijing-based owner of short-video platform TikTok, is moving towards creating its own metaverse with the acquisition of VR start-up Pico Interactive. Pico VR headsets are often seen as ByteDance's response to the popular Meta Quest headsets and they currently dominate in China with over 58% of the market share for VR headsets.⁸



⁷ HTC VIVE and Epic Games Announce New Investment in Wevr for Cutting-Edge VR Brand Experiences. (2024, September 07). Retrieved from <https://blogvive.com/us/htc-vive-and-epic-games-announce-new-investment-in-wevr>
⁸ Ye, J. (2023). ByteDance says committed to VR business Pico after report of it shutting brand. Reuters. Retrieved from <https://www.reuters.com/technology/bytedance-says-committed-vr-business-pico-after-report-it-shutting-brand-2023-10-24>

⁹ Metaverse - Pakistan | Statista Market Forecast. (2024, March). Retrieved from <https://www.statista.com/outlook/amo/metaverse/pakistan>

¹⁰ PromiAD. (2021). MIT supports Islamabad-based virtual startup called Aiyin - PromiAD. PromiAD. Retrieved from <https://promiad.com/mit-supports-islamabad-based-virtual-startup-called-aiyin>

¹¹ Ahmed, Z. (2017). WonderTree: A Pakistani startup that is specifically designed for 'special children'. PakWired. Retrieved from <https://pakwired.com/wondertree-a-pakistani-startup-that-is-specifically-designed-for-special-children>

¹² Editors. (2022). Foodpanda opts to use gamified simulation training | DigiconAsia. DigiconAsia. Retrieved from <https://digiconasia.net/news/foodpanda-opts-use-gamified-simulation-training>

¹³ Editors. (2022). Foodpanda opts to use gamified simulation training | DigiconAsia. DigiconAsia. Retrieved from <https://digiconasia.net/news/foodpanda-opts-use-gamified-simulation-training>

¹⁴ Press Release. (2022). Pakistan's First Complete 3D View of Faisal Masjid Has Been Placed in Decentraland Metaverse. ProPakistani. Retrieved from <https://propakistani.pk/2022/03/24/pakistans-first-complete-3d-view-of-faisal-masjid-has-been-placed-in-decentraland-metaverse>

¹⁵ Style, B. R. L. &. (2022). Minar-e-Pakistan entering the metaverse. Breccorder Retrieved from <https://www.breccorder.com/news/40209365>

Pakistan's First VR Documentary Series

In 2017, Pakistan produced its first virtual reality film series called Look But With Love.¹⁶ This five-part documentary series premiered at the 55th New York Film Festival, the inaugural Tribeca TV Festival and the Future of Storytelling.

Look But With Love tells the stories, in a 360-degree experience, of some exceptional Pakistanis who have made efforts to change the socio-political landscape of their communities. These people range from a doctor from the slums of Karachi who has dedicated his life to providing free emergency care to children, to a courageous community of women in Nowshera.

Virtual Reality as an experience is very immersive. I wanted audiences to interact with Pakistan in a completely different manner. In the series I have focused on Pakistan's unsung heroes... you will be able to literally walk in their shoes as they fight to save children in emergency hospitals and bring clean water to villages finally a series where you can understand the spirit of the struggle of everyday heroes as they address Pakistan's most pressing issues.

– Sharmeen Obaid-Chinoy



Exporting the Metaverse

In a historic first, Narsun Studios, a Pakistani startup, has become the first foreign metaverse and gaming studio to establish its studio and academy in Saudi Arabia.¹⁷

Narsun Studios emphasized that this project will contribute to the goals of Vision 2030, by enabling local Pakistani talent to train and nurture Saudi youth in this field. This engagement will also provide local access to world-class games, metaverses, and immersive VR/AR/MR/ER experiences services leveraged by Saudi organizations operating in sectors as diverse as housing and real estate, tourism and hospitality, healthcare, digital government, gaming and sports. Narsun Studios has also announced

the first ever metaverse in Pakistan: The Cloud City Metaverse (TCCM). Cloud City is a world that is always active, allowing users and players to own their personal virtual land, build structures and rent them out. While it will be free to play, users can opt to purchase NFTs, giving them customization and ownership of their assets.¹⁸



¹⁷ Studios, N. (2023). NARSUN becomes the First Foreign Metaverse and Gaming Studio to Enter Saudi Arabia under the IGNITE Program. Medium. Retrieved from <https://narsunstudios.medium.com/narsun-becomes-the-first-foreign-metaverse-and-gaming-studio-to-enter-saudi-arabia-under-the-ignite-program-e284752146b2>

¹⁸ Advertisement. (2022). Pakistan all set to enter metaverse with country's first mega Web3 project 'The Cloud City Metaverse' & #039;. DAWN. Retrieved from <https://www.dawn.com/news/1715488>



¹⁶ NewsBytes. (2024, September 07). Sharmeen Obaid announces Pakistan's first virtual reality series. Retrieved from <https://www.the-news.com.pk/magazine/us/227167-Sharmeen-Obaid-announces-Pakistans-first-virtual-reality-series>

Metaverse for Training and Education

VR and metaverse applications related to the defense sector are fast being commercialized in Pakistan. Defense related training is very expensive and requires access to sensitive and strategic equipment. To address these challenges, Pakistan is developing multiple simulators including tank simulators, aircraft simulators, rifle simulators, and free fall simulators.¹⁹

Another advancement is the launch of virtual reality (VR) classes by the Information Technology University (ITU) of Lahore.²⁰ By embracing VR

technology, ITU aims to transcend traditional learning boundaries and provide remote students with an immersive educational experience that rivals physical classrooms.

The new courses will simulate the traditional classroom experience via virtual reality headsets and motion tracking. This program was reportedly developed in partnership with the University of Denmark. It also perhaps takes inspiration from the university's spiritual alma mater, the Massachusetts Institute of Technology (MIT).²¹



EdTech	WonderTree, OrbitEd, DigiPaint
PropTech	Homevism, MimAR, Mapalytics
Software Houses	Elytra Studios, Euphoria XR, HD 360, Darul Studios
Entertainment	Moshpit, Wonder Tech
Gaming	Kiwi Creation
Architecture	RenderLounge, Pixarch

Notable Companies in AR, VR and XR Industry in Pakistan



RENDER
LOUNGE

RenderLounge

Renderlounge is a visualization studio focused on producing realistic 3D renderings, virtual reality (VR) experiences, and metaverse environments. Serving industries such as architecture, real estate, automotive, engineering, and healthcare, the company specializes in creating highly immersive digital experiences. Renderlounge operates from Lahore, Pakistan, and offers its services worldwide, with a focus on enhancing project visualization and client presentations through advanced, interactive technology. Its portfolio includes architectural visualizations, virtual walkthroughs, and simulations for product design, utilizing software like Unreal Engine to create lifelike, interactive environments.

The studio has gained recognition for its work, earning several awards that highlight its innovative approach to digital visualization. Among its honors are the San Francisco Award for Architectural Designer in 2022 and 2023, and the APAC Insider's Most Innovative Experience Developer title in 2021. Renderlounge has also been awarded by the Build Architecture Awards, receiving the titles of Best



Architectural Visualization Studio (MENA) in 2022 and Best Design & Visualization Studio (MENA) in 2023. In 2023, RenderLounge further gained distinction in the metaverse sector with recognition for Most Innovative Metaverse Building Visualization (MENA). Additionally, the studio is an Epic MegaGrant recipient, underscoring its commitment to advancing 3D and VR visualization.²²

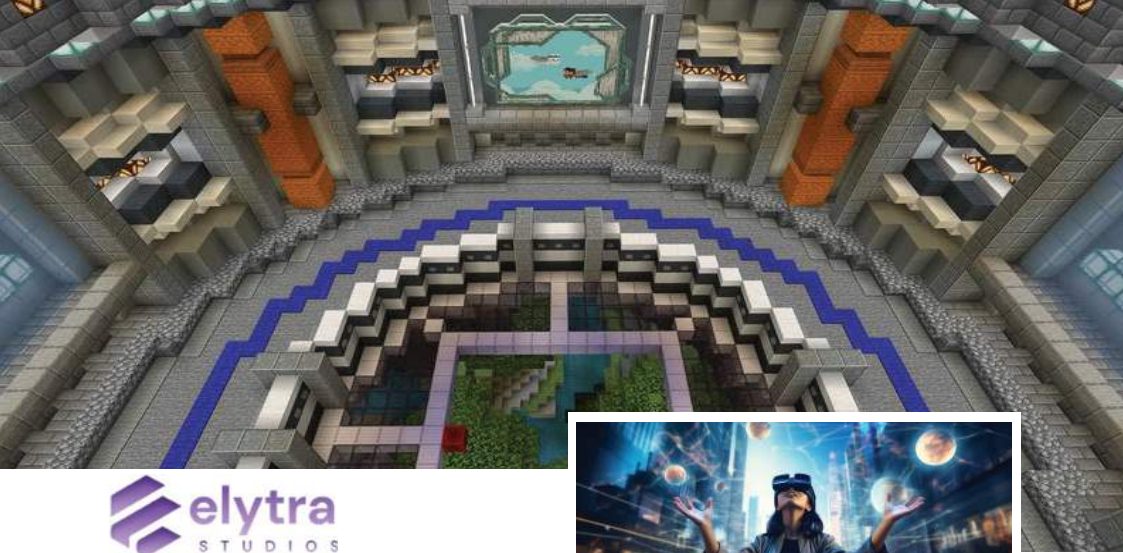
Renderlounge's capabilities extend to creating virtual reality tours that offer clients a comprehensive view of proposed developments or products in a simulated environment. These VR tours are particularly beneficial in real estate and architectural sectors, where clients can experience properties in immersive detail before construction. For metaverse projects, Renderlounge designs custom 3D environments and assets that allow users to interact within digital spaces, making it suitable for clients seeking to establish a presence in virtual worlds. In automotive and product visualization, the studio employs high-detail renderings and interactive models that help companies visualize and present new products with precision.

¹⁹ Establishment(dgrde), D. G. R. & D. (2024, September 07). Directorate General Research & Development Establishment(DGRDE). Retrieved from <https://rde.gov.pk/Detail/YzjOTdZTgtOTUwYiooOGNlWEzMjgtNDBjNzVhMTExNTU4>

²⁰ ITU Lahore launches first virtual reality classes - Daily Times. (2024, March 21). Retrieved from <https://dailytimes.com.pk/1179316/itu-lahore-launches-first-virtual-reality-classes>

²¹ t1696654/

²² 3D Rendering Services - Real Estate, Architecture, Products. December 27, 2023. Renderlounge. <https://www.renderlounge.com/>.



Elytra Studios is an interactive development studio specializing in augmented reality (AR), virtual reality (VR), and gaming solutions. The studio offers comprehensive services across the AR, VR, and mixed reality (MR) domains, focusing on immersive content creation and AAA game development. Elytra Studios caters to a wide range of industries, including entertainment, enterprise, and consumer electronics. The company has established itself as a strategic partner for brands like Pepsi, MARVEL, Doctor Who, and DC, developing experiences that leverage extended reality to engage audiences in novel ways.

Elytra Studios has been recognized on industry platforms like Clutch and The Manifest, underscoring its impact within the AR/VR and gaming sectors. The studio's reputation is further solidified through collaborations with high-profile clients and projects that

include digital environments, interactive characters, and architectural visualizations. In recent years, Elytra Studios has gained attention for its custom 3D character development and its approach to creating detailed environments for AR and VR applications. This work spans everything from concept to production, emphasizing design and technology that support compelling, interactive experiences.

With a dedicated team, Elytra Studios employs a full suite of design tools like 3ds Max, Maya, and Mudbox to bring 3D characters and environments to life. The company also offers mobile development, helping brands extend their digital presence through apps that use AR features. Additionally, Elytra Studios provides game development services across genres, creating simulators, action games, and racing games to meet varied client demands.



Euphoria XR

Euphoria XR is a prominent software development and IT consulting firm that specializes in augmented reality (AR) and virtual reality (VR) solutions. With a team of over 100 full-stack engineers, designers, and innovators, the company has successfully completed numerous IT projects, leveraging cutting-edge technology to transform client ideas into immersive experiences. Euphoria XR provides advisory and development services across various formats, including VR, AR, extended reality (XR), and mixed reality applications, ensuring that its offerings stay at the forefront of technological advancements.

Euphoria XR's expertise encompasses a wide range of services such as blockchain



development, artificial intelligence, and NFT solutions, as well as 360-degree video production and branded AR filters. The firm is recognized for its timely delivery of high-quality services that meet budgetary constraints. Its commitment to client success is reflected in a robust portfolio that features collaborations with major global brands like NFL, Nestlé, Total, and Uber, showcasing a diverse range of on-demand solutions designed to enhance brand communication and boost client engagement.



The studio excels in virtual reality and augmented reality development, crafting engaging 360-degree videos and custom WebAR and WebVR applications tailored to client specifications. Euphoria XR also focuses on immersive brand strategies, utilizing its deep understanding of emerging technologies to give clients a competitive edge in the evolving

digital landscape. The firm emphasizes interactive storytelling, employing creative direction from concept development through to execution, ensuring each project resonates with the intended audience.

Euphoria XR operates a dedicated Metaverse studio, providing services for the creation of NFT projects and bespoke applications that integrate AI and blockchain technologies.

This comprehensive approach enables clients to tap into the latest trends and opportunities within the digital realm, facilitating the transition to a more immersive online presence. Furthermore, the company supports its clients

through back-end services including data management and analytics, helping to monitor and optimize user engagement throughout the lifecycle of their projects.

With multiple offices across the globe, including locations in the United States, Saudi Arabia, the United Kingdom, and Pakistan, Euphoria XR has established a solid international footprint. Its adherence to innovative, technology-driven solutions positions it as a key player in the AR/VR space, driving the evolution of immersive experiences while prioritizing client needs and delivering measurable results.



HomeVism

HomeVism is a leading innovator in the construction sector of Pakistan, focusing on Augmented Reality (AR) and Virtual Reality (VR) technologies to enhance architectural visualization and project execution. By leveraging cutting-edge AI algorithms and 3D modeling techniques, HomeVism aims to bring clients' dream villas and architectural projects to life. Their services encompass a range of offerings, including 3D architectural renderings, interactive design solutions, and specialized marketing strategies tailored for both B2B and B2C markets.

The company has established a strong reputation in the industry, recognized for its commitment to advancing the development sector in Pakistan through immersive technology. HomeVism has participated in various competitions and initiatives, gaining acknowledgment for its innovative approach to construction and design. Their credentials include partnerships with leading architectural firms and participation in initiatives aimed at fostering technological adoption in real estate and construction.

HomeVism employs several advanced technologies to deliver its services. The company specializes in interior and



exterior visualization, creating detailed 3D architectural models that incorporate realistic textures and materials. Their AR/VR visualization services utilize state-of-the-art headsets, allowing clients to experience their designs in an immersive environment. Additionally, the company offers blueprint plan visualization, which transforms traditional 2D blueprints into dynamic 3D representations, enabling clients to visualize their projects more clearly.

The on-site visualization service is particularly noteworthy, allowing clients to view their homes or buildings at the construction site through their smartphones, offering a unique opportunity to explore the space before completion. HomeVism also provides real-time floor and wall alteration features, enabling interactive interior design experiences where clients can modify tiles and textures in a mixed-reality setting. These services enhance client engagement and streamline the decision-making process, reducing the risk of costly changes during construction.



PIXARCH

Pixarch

Pixarch is a leader in 3D architectural visualization and rendering services. The company specializes in creating lifelike architectural presentations, ranging from 3D animation walkthroughs to photorealistic renderings and virtual reality environments. Operating in markets including Pakistan, Saudi Arabia, and the UK, Pixarch offers comprehensive visualization solutions that assist clients in envisioning and pre-planning complex projects in both commercial and residential spaces. Their service portfolio, including augmented reality integrations and 3D floor plan services, caters to real estate developers and other clients who require immersive, realistic portrayals of unbuilt spaces.



The company's high-profile projects have won acclaim, particularly for their accuracy in virtual reality presentations and photo realistic quality. Its advanced visualization campaigns, such as the full 360-degree marketing strategy developed for The Court Skyscraper, reflect the company's expertise and attention to comprehensive brand experiences.

Pixarch's portfolio encompasses successful projects including Parkview City, Lakeview, Citi Residencia, and ARY Laguna, where its visualization solutions have been instrumental in marketing and customer engagement. The company employs a client-centric approach, integrating services like brand identity development, 3D floor plans, and architectural walkthroughs to ensure each project is customized to meet specific requirements. The success of these projects has bolstered Pixarch's presence across several major

markets, serving both local and international clients with reliable delivery timelines and high-quality visual output.

The company boasts impressive operational statistics, having completed a significant number of projects worldwide, with an established footprint in prominent real estate developments. In addition to expanding its service offerings, Pixarch continues to innovate within the architectural visualization space,

utilizing the latest advancements in AR, VR, and 3D modeling to optimize client presentations. Its use of "Pix Touch" for visual design and "Live Presenter" for real-time project demonstrations underscores Pixarch's dedication to offering engaging, interactive client experiences.

With a diverse portfolio, robust technological expertise, and a reputation built on precision and quality, Pixarch has positioned itself as a valuable partner for clients in the real estate and construction sectors. By providing a blend of visual design services, virtual reality environments, and detailed architectural walkthroughs, Pixarch enables its clients to effectively communicate project visions, attract stakeholders, and maximize project potential from inception to completion.





HD360

HD360.pk offers specialized services in multimedia, IT, virtual reality, and web applications. Known for its client-focused approach, the company provides advanced solutions in 360-degree virtual tours, drone photography, video production, and interactive web design, serving industries ranging from real estate and retail to education and healthcare. HD360.pk's services are available in Lahore and Islamabad, Pakistan, with extensions in Ras al-Khaimah, UAE, and California, USA, allowing it to reach a diverse client base across sectors. The company's focus on cutting-edge, immersive experiences in virtual environments has attracted notable clients, including ICI, Unilever, Gloria Jean's, and Walls.



Among HD360.pk's primary services are its 360-degree virtual tours, which enable businesses to create an interactive viewing experience for customers. This service includes customized features such as VR compatibility, interactive guides, embedded maps and floorplans, and background audio to enhance user engagement. The company also offers Google Business Virtual Tours, allowing businesses to boost their visibility on Google platforms. HD360.pk's expertise extends to 360° aerial tours via drones, offering high-quality visuals that are suitable for industrial photography, geospatial mapping, and surveys, giving companies a comprehensive tool for remote facility management and presentations.

The company's photography and videography services encompass 360° rotatable product photography, staff portraits, business facility photography, and video advertisements tailored for business promotions. These solutions are optimized for high-resolution outputs, making them suitable for both digital

marketing and client presentations. HD360.pk's website design services offer both static and dynamic site options, with features like responsive design, domain hosting, and SEO integration. For clients seeking a full digital presence, the company also provides search-engine-optimized content and web portfolio photography, ensuring the website performs effectively on search engines and

delivers a cohesive brand experience online.

HD360.pk's portfolio includes virtual tours of prominent locations and facilities such as Beaconhouse School, Union Luxury Apartments, and Arif Memorial Hospital, showcasing their capacity to create detailed and interactive virtual spaces. These projects highlight the company's capabilities in providing realistic tours for various applications, including educational institutions, residential developments, and industrial facilities. HD360.pk's 8K Ultra HD-ready product photography portfolio further demonstrates its commitment to high-resolution imagery, enabling clients to zoom in on intricate product details, an ideal solution for online retail and product showcases.

Primary Projects:





WonderTree

WonderTree is an AR/VR startup committed to developing interactive tools that enhance emotional and cognitive skills, particularly for children with disabilities or neurodevelopmental disorders. At the heart of its offerings is Wonder Games, a suite of Augmented Reality games designed to support children's educational, motor, and cognitive skill development. The platform provides therapeutic exercises that are not only effective but also engaging, leveraging interactive AR elements to foster meaningful participation. For institutions, WonderTree extends tailored packages, making it easier for schools, therapy centers, and organizations to integrate these tools into their programs. Additionally, the platform includes Live Reporting, which enables educators and therapists to monitor each child's progress in



real time, and offers access to free therapy to ensure that children have continuous support outside of clinical settings.

Over the years, WonderTree has achieved widespread recognition both in Pakistan and internationally. The company has been honored at prestigious competitions such as the APICTA Awards and the Global Entrepreneurship Summit, showcasing its innovation in the field of digital therapy. Their accolades include a third prize at the GIST Tech-I competition and multiple awards from the P@SHA ICT Awards, where WonderTree secured both runner-up and winning positions. The startup also received the Shell Tameer Award and was a runner-up at the Pakistan Innovation Forum. Recognized as alumni of The Nest I/O and a participant in the IIm Ideas 2 project, WonderTree has garnered backing

from global technology and development leaders like Samsung, Google, and DFID, further validating its impact and potential in the AR/VR sector.

WonderTree's solutions have made significant strides in transforming traditional therapy into a more accessible and engaging format. The company's offerings incorporate real-time physiotherapy exercises into their games, allowing children to develop essential skills through play-based learning. By integrating therapy with AR technology, WonderTree ensures that children experience a balance of enjoyment and developmental progress, which can be tracked continuously. The addition of live

reporting features facilitates data-driven insights for parents and educators, who can adapt their approaches based on the child's performance, while free therapy access ensures that the platform remains inclusive and available to a broad demographic.



I use WonderGames with my patients for the rehabilitation of their neurological issues and physical disabilities, and I must say, I have seen progress and good results. It's an innovation in the field of physiotherapy²³

- Krystina Vlckova, Senior Occupational Therapist, Ziauddin Hospital



²³ "Play Fun & Inclusive Online Games for Children with Special Needs | WonderTree." n.d. www.wondertree.co. Accessed July 19, 2024. <https://www.wondertree.co/>.



Orbit-Ed

Orbit-Ed is a leader in the application of AI-driven VR solutions, specializing in enterprise training across healthcare, employee development, technical skill building, and behavioral assessment. Through immersive, AI-enhanced VR environments, Orbit-Ed enables organizations to foster growth, enhance empathy, and build essential skills. Their solutions emphasize soft skills development and tailored training paths, helping companies achieve transformative results in workforce readiness and productivity. By focusing on real-world applications in healthcare and enterprise environments, Orbit-Ed's VR technology serves a critical role in upskilling and behavioral training.

Orbit-Ed has received notable recognition for its innovative work in AI and VR. Industry accolades include partnerships with prominent clients such as PepsiCo and collaborations with leading institutions like the National Science and Technology Park (NSTP) at National University of Science and Technology (NUST).

These partnerships are complemented by achievements in



delivering customized training solutions that address complex enterprise needs. Testimonials from clients highlight Orbit-Ed's impact, with leaders from PepsiCo and NUST acknowledging the platform's role in delivering real-time, unbiased analytics and empowering participants to visualize their training performance. This reputation has helped Orbit-Ed secure a position as a trusted provider for companies seeking scalable, AI-driven insights.

The efficacy of Orbit-Ed's solutions is evident in data reflecting participant improvement across key performance metrics. In measurable outcomes, 85.71% of learners reported enhanced preparation, 71.43% noted improvements in authenticity, and 64.29% experienced increased confidence post-training. These statistics underscore Orbit-Ed's success in addressing both personal and professional growth areas, demonstrating the tangible benefits

of VR-based learning in fostering core skills. This data-driven approach to training enables companies to quantify improvements and make informed decisions about employee development. Orbit-Ed's primary services include VR training for healthcare professionals, workforce skill enhancement, behavioral assessment, and technical training. These services are powered by AI to ensure adaptable, personalized learning experiences for each organization.

The platform's advanced analytics capabilities transform raw data from learner interactions into actionable insights, helping enterprises uncover inefficiencies, reduce customer dissatisfaction, and enhance operational productivity. With flexible deployment options, including cloud and on-premise integration, Orbit-Ed provides secure, scalable solutions tailored to enterprise needs.

We have developed a soft skills development program for our sales team and the one area that was a pain point for us was that we were unable to provide unbiased, and customized analytics, and data points to the participants in order to give them the visibility of how they are performing. So, we embedded Orbit-Ed in our training intervention program, and it really helped us provide those insights in real time - so thank you Orbit-Ed.

- Sana Saleem HRBP, PepsiCo 99

The integration of VR technology and AI engines for communication skills assessment has exceeded my expectations. It represents a paradigm shift in how we approach and enhance our communication abilities. I am grateful for the opportunity to leverage these advanced tools and am confident that they will play a pivotal role in shaping the future of effective communication training. We are convinced that experiencing this immersive technology could significantly enhance the team's communication capabilities.

- Rubia Javeed Assistant Manager HR, Kohinoor Textile Mills Limited





mimAR

mimAR Studio specializes in comprehensive architectural visualization and design solutions, catering to clients across real estate, architecture, and interior design sectors. With an emphasis on photorealistic 3D rendering, mimAR's services provide clients with lifelike representations of projects before construction begins, enabling effective project planning and resource allocation. Their offerings cover architectural design, interior and urban planning, branding, and immersive 3D visualization, all tailored to elevate project presentations. Utilizing advanced software and technology, mimAR allows clients to visualize their projects with precision, enhancing the decision-making process and reducing potential design alterations during construction.

Their 3D visualization services provide high-quality renderings, animation, and VR-enabled experiences, delivering engaging and immersive project views for potential buyers and stakeholders. Through interactive services, including VR tours, digital walkthroughs, and dual-screen experiences, mimAR offers real estate and architecture clients an



advanced way to showcase unbuilt spaces. These solutions help clients make a compelling impression, offering an interactive preview that stands out in the competitive market. The integration of AR and VR in these services reflects mimAR's commitment to staying at the forefront of technological advancements in architectural visualization.

mimAR also delivers a suite of branding and marketing services to reinforce client visibility and brand recognition. From branding collateral and logo design to comprehensive marketing strategies, their services aim to create a cohesive and compelling brand narrative. With expertise in social media marketing, website development, Search Engine Optimization (SEO) and Search Engine Marketing (SEM), mimAR supports clients in reaching targeted audiences effectively, ensuring that their projects attract interest across

digital platforms. Their branding services include designing stationery, brochures, and other marketing materials that align with the client's brand vision, providing a unified approach to project marketing.

The studio has gained recognition in international forums, representing Pakistan at notable events, including 4YFN in Barcelona and the Entrepreneurship World Cup in Riyadh. They have also

earned accolades such as the Innovator Seed Fund (ISF) Award by the Higher Education Commission in Islamabad and have placed as finalists in local competitions like the Pakistan Startup Cup. Their work with diverse clients from the United States, the United Arab Emirates, and Pakistan highlights their global outreach and ability to meet the expectations of a broad client base.



Working with mimAR has been a smooth ride. My team has hardly faced any problems from their end as they kept a positive and professional attitude throughout the project. I wouldn't be lying if I said that these young people are the future of architectural visualization in Pakistan.

-Ali Raza (Pakistan)



Reasonable rates, clear communication, and top-quality VR services. That's how I would describe mimAR according to my experience. This is my second time working with them and I would like to say that they have the best talent for each service they offer.

- David Chen (USA)





Darul Solutions

Darul Solutions is a forward-focused company specializing in the integration of AR/VR technologies to provide custom solutions across various industries. Their primary offerings include 3D product configurators, virtual reality experiences, 3D animations, and architecture visualization. The company has established itself as a provider of immersive solutions, enabling clients to visualize and interact with complex designs and products in real-time. Additional services include web and mobile application development, 360-degree virtual tours, and website configurators, all designed to create comprehensive digital environments for client engagement.

A core component of Darul Solutions' services is its 3D Product Configurators, which allow clients to interactively customize products with real-time adjustments, enhancing the consumer experience and supporting e-commerce capabilities. They also offer Web Product Configurators, leveraging web-based platforms to help clients visualize and revise designs directly on their websites. Their configurators span a range of



applications, with use cases from automotive to furniture, showcasing the flexibility and depth of customization available. For the real estate sector, Darul Solutions provides 360 Virtual Tours that capture properties with detailed, panoramic views, enabling prospective buyers to explore interiors and exteriors remotely.

The company's expertise extends to creating virtual reality environments that serve industries seeking interactive and visually captivating ways to engage customers, including events and marketing. By providing immersive VR experiences, Darul Solutions enables users to navigate spaces or interact with products in a simulated environment, adding an experiential layer to customer engagement. Their 3D Animation services further complement their VR and visualization offerings, with animations crafted to meet client specifications, whether for advertising, product demonstrations, or architectural renderings. Additionally, their architecture visualization capabilities offer photorealistic 3D renderings that assist professionals in securing investments and facilitating stakeholder buy-in.

Darul Solutions has served an expanding list of clients through its multi-industry applications, with a portfolio that includes bag configurators, car canopy configurators, and even unique projects like foosball table customizers. This diverse range highlights their adaptability to various business requirements, from automotive companies to consumer goods. Despite a current valuation under USD 5 million, the company's focus on AR/VR innovation positions it well for growth, especially as they continue to enhance their products and broaden their reach within new markets.

Based in Pakistan, Darul Solutions actively collaborates with international clients, contributing to a global footprint in AR/VR solutions. Their technology-driven services not only simplify complex design processes for businesses but also allow for automation and real-time interaction, making them a notable emerging company in the AR/VR landscape.



Moshpit Studios

Moshpit Studios is an AR/VR development company dedicated to transforming live entertainment experiences through immersive technologies. Specializing in virtual concerts, VR gaming, and event simulations, Moshpit Studios enables users to experience music and performances in entirely new ways. The company uses advanced platforms like Unreal Engine 5 to deliver rich, high-fidelity environments, allowing audiences to attend concerts, interact with AI-generated crowds, and explore complex, dynamic worlds. By creating virtual spaces with realistic weather changes, day-and-night cycles, and adaptive visual effects, Moshpit Studios brings a heightened level of interactivity to virtual events.

The studio's flagship product, the Moshpit Universe, is a versatile virtual environment where users can attend shows by their favorite artists, roam various themed venues, and interact with friends and other fans in real time. The experience extends beyond passive watching, as users can explore each venue, participate in activities, and even witness AI-powered crowd responses. Another significant feature is the Moshpit Creator Studio, an

artist-driven platform that allows creators to design and host virtual shows from their own locations. Using tools integrated with Unreal Engine 5, artists can produce performances without extensive technical setup, lowering barriers to entry for musicians and entertainers. In addition to Moshpit Universe, the company offers personalized avatars that enhance the user experience within these virtual spaces. The "Digital Twin" feature allows users to create highly customizable 3D avatars, representing their likeness and style in virtual worlds. This adds a layer of personalization that strengthens user engagement and fosters a sense of community within Moshpit Studios' platforms. With over 3,400 active venues, shows, and unique avatar experiences, Moshpit Studios

has built an expansive digital ecosystem that supports multiple event types, from large-scale concerts to private gatherings. Moshpit Studios collaborates with a growing number of artists and entertainment companies, forming partnerships that broaden the reach of virtual concerts and events. The platform's adaptability has attracted partnerships across various segments of the entertainment industry, and the studio actively collaborates with artists to enhance user engagement. Although still relatively new, Moshpit Studios has earned industry recognition for its innovation in VR entertainment, and its platform continues to gain popularity among both users and creators, signaling a promising future in the immersive event space.



What I saw in Moshpit was a way to help push the creative node of one's self, and knew deep inside that there's a place for everyone to be equal, respected and acknowledged for their talent. A stage of unlimited opportunity to finally play in front of millions of cheering fans around the world.

-NKRIOT



This virtual/VR world is so cutting edge, who wouldn't want to break new earth with such an endeavor? This is the future. Society, culture, technology, and social habits are forcing us even more toward this realm. If I find the right platform to invest in, accompanied by a new technology, then I have hope. This is the beauty of Moshpit, says featured artist Sean.



Kiwi Creations

Kiwi Creations is a dynamic AR, VR, and game development company, known for crafting innovative digital experiences for a wide range of clients, from emerging startups to Fortune 50+ companies.

The company offers a comprehensive portfolio of services, including AR/VR app consultation, location-based AR/VR development, virtual tours, interactive games, immersive shopping experiences, and advertising solutions. Kiwi Creations specializes in creating training simulations that improve user engagement and retention while reducing traditional training costs. Leveraging technologies like Oculus, PlayStation VR, HTC Vive, and AR platforms such as ARCore, ARKit, and Vuforia, the team provides precise, custom-built solutions for clients aiming to integrate AR/VR into their operations.

The company has developed a rich portfolio of games and interactive applications, such as Megaverse, a hyper-realistic metaverse platform that merges virtual living, shopping, and gaming experiences. Other notable projects include The Moopians, an adventurous journey through imaginative landscapes; Maruland, a strategic role-playing



game; and Corgi Dash, a lighthearted racing game. Kiwi Creations also creates educational applications, exemplified by Thinkey Lab, an engaging game designed to foster learning.

Kiwi Creations has partnered with leading-edge technology providers, delivering exceptional results for clients across the globe. The company's expertise has earned it recognition and accolades, further cementing its position as a trusted name in AR/VR and game development.

Primary Projects:

- ▶ Megaverse
- ▶ The Moopians
- ▶ Thinkey Lab



Kiwi Creations is an excellent team with a to-do attitude. This team made my job super easy and responded to be timely. - Waqar Ali, Whetstonez



Very flexible team, I'll keep working with Kiwi Creations. Best of Luck! - Santhosh Kumar, MetaMall Group



Mapalytics excels in AR, VR, and GIS solutions, delivering sophisticated 3D mapping and immersive technology services across various sectors. Specializing in advanced 3D scanning, GIS applications, and digital twin creation, Mapalytics empowers clients to improve operations, gain valuable insights, and conserve historic sites. In real estate and construction, the company's automated drone mapping and GIS technology aid in planning and monitoring, reducing delays and managing costs. Their expertise in spatial data and digital maps transforms complex property records into comprehensive GIS solutions, serving local governments, utilities, and real estate developers.

A core offering includes Virtual Reality (VR) solutions such as 8K 360-degree video production, VR tours, and architectural visualizations, enabling users to explore accurate, photorealistic spaces ideal for real estate, heritage preservation, and education. The VR Time Travel Portal provides historical site tours, while VR architectural visualizations allow clients to examine building designs pre-construction. Mapalytics also offers VR simulation training for lifelike professional development across industries.



Mapalytics' 3D scanning technology supports applications from construction tracking to historical preservation. By creating digital twins of sites and artifacts, the company enables detailed spatial analysis and efficient data management for industries needing accurate land and volumetric assessments. Projects include an 8 HDR panorama VR video of Islamabad, 3D-scanned cultural landmarks like Lahore's Chaburji, and digital replicas of Bahrain's Manama Souq for architectural enhancements. They enable virtual exploration of Islamabad's TopCity-1 through Google Street View and showcase environments like Jazz Headquarters and Packages Mall through VR tours. A virtual tour of the Institute of Culture and Arts further highlights Mapalytics' capabilities in immersive campus showcases.

Notable achievements include collaborations with UNESCO on digital heritage preservation and recognition as a Google Street View Trusted Agency. Over the past year, Mapalytics has facilitated the preservation of cultural sites and enabled large-scale virtual tourism, creating accessible digital experiences for sectors such as real estate, tourism, and heritage conservation.



Wonder Tech

WonderTech delivers cutting-edge digital solutions by harnessing Virtual Reality (VR), Augmented Reality (AR), Gamification, and Artificial Intelligence (AI). Since its founding over a decade ago, the company has served more than 100 clients from 50 industries, dedicating over 8,000 work hours to projects that elevate training, marketing, and digital transformation strategies. Leveraging advanced technologies, WonderTech offers services that encompass immersive training simulators, interactive marketing tools, and AI-powered business solutions designed to foster growth and innovation.



In VR, WonderTech creates 360-degree video tours, architectural visualizations, and immersive training simulators. One notable project includes a 360-degree virtual tour for Jaffer Business Systems, which highlights the company's office facilities, providing clients with an interactive experience of the space. Another VR project is the "VR Escape Room," a gamified training tool that promotes team-building

and collaboration for HR and training departments. These VR solutions are instrumental in real estate, education, and corporate training, allowing users to interact with realistic, photorealistic spaces, whether for showcasing properties or simulating complex scenarios for professional development.

WonderTech's AR services extend to marketing and entertainment



through the development of AR apps and interactive filters for social media. Their work for Maybelline, which included custom Instagram and TikTok filters, allowed users to explore beauty products interactively, while a collaboration with Lucky One Mall brought AR experiences to the OnederLand amusement park, enabling gesture-based interactions that engage visitors. The company also developed AR filters for L'Oréal, enhancing the brand's social media presence and user engagement. These AR-driven marketing tools are designed to captivate audiences and encourage brand interaction, particularly in sectors like retail and entertainment.

Gamification is another key area of WonderTech's expertise, applied in projects that merge education and entertainment. For Bain & Company Singapore, WonderTech created "Bain City," a gamified recruitment tool that immerses management trainees in real-world

decision-making scenarios. Additionally, they developed "Deliver It Right," an e-learning game for HBL, aimed at enhancing bank tellers' service skills. These gamified solutions use interactive gameplay to help companies improve recruitment processes and employee performance, creating memorable and effective learning experiences.

WonderTech's reputation is further bolstered by partnerships with major brands such as Unilever, GSK, and L'Oréal, along with accolades that include a Google Street View Trusted Agency designation. Their projects, spanning sectors from retail and finance to entertainment, demonstrate a strong commitment to creating high-impact digital experiences. Through innovative applications of AR, VR, AI, and gamification, WonderTech continues to push the boundaries of what immersive technology can achieve for business transformation and user engagement.

TALK TO US



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About this Industry Roundup

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

Disclaimer

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