

Virtual Reality Market Assessment, By Component (Hardware, Software), By Device Type (Head-mounted Display [HMD], Gesture-tracking Device [GTD], Projectors & Display Wall [PDW], and others), By Technology (Semi Immersive, Fully Immersive and Non-immersive), By Distribution Channel (Online, Offline), By End-use Industry (Gaming, Media and Entertainment, Retail, Healthcare, Military and Defense, Architecture, Education and Training and Others), By Region, Opportunities and Forecast, 2016-2030F

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Abstracts

Global Virtual Reality Market size was valued at USD 25.12 billion in 2022 which is expected to reach USD 107.87 billion in 2030 with a CAGR of 19.98% for the forecast period between 2023 and 2030. Virtual Reality (VR) technology allows users to immerse themselves in a three-dimensional environment within the real world by utilizing devices like VR headsets, glasses, gloves and bodysuits. This technology has significantly transformed the gaming and entertainment industry by enabling users to engage in highly realistic virtual gaming experiences.

VR headsets, such as the Oculus Rift, HTC Vive, or PlayStation VR, are some of the most popular devices used to experience virtual reality. These headsets typically consist of a high-resolution display, motion sensors, and sometimes even built-in audio systems. When worn, they track the user's head movements and adjust the displayed content, accordingly, giving the illusion of being present within the virtual environment.

The growing adoption of virtual reality in instructional training has contributed to the expansion of the market. This is particularly evident in industrial sectors where field workers, engineers, mechanics, pilots, defense personnel, and technicians benefit from immersive training experiences. In addition to training and education, virtual reality has found extensive use across different industries, including automotive and healthcare, due to the advantages it offers in operations. For instance, in April 2021, Bayerische Motoren Werke AG (BMW) launched Virtual Viewer, a web browser-based Augmented Reality experience powered by 8th Wall. It provides an innovative way for customers to customize a BMW model, select, learn, and explore the organization's Plug-in Hybrid Electric Vehicles (PHEVs).

Enhanced Gaming and Entertainment Experiences

VR technology enables gamers and entertainment enthusiasts to immerse themselves in virtual worlds and experiences that feel more realistic and immersive than traditional gaming or entertainment mediums. The ability to step into a virtual environment and interact with it using VR headsets and peripherals creates a heightened sense of presence and engagement, enhancing the overall gaming and entertainment experience.

VR technology offers a higher degree of interactivity compared to traditional gaming systems. Users can physically move, gesture, and manipulate objects within the virtual environment, providing a more intuitive and engaging experience. This increased interactivity, combined with the immersive nature of VR, allows users to feel a deeper connection with the virtual world, leading to high satisfaction. Overall, enhanced gaming and entertainment experiences provided by VR technology captivate consumers by offering new levels of immersion, interactivity, and innovation. This drives the demand for VR products and experiences, leading to the growth of the VR market in the gaming and entertainment sectors. For instance, in 2023, Sony Interactive Entertainment announced the next-generation PlayStation VR 2 for the PlayStation 5 console. The new VR headset delivers enhanced visuals, improved tracking, and a redesigned controller with haptic feedback and adaptive triggers, providing a more immersive and tactile VR gaming experience.

Increasing Applications of Virtual Reality

As VR technology expands beyond gaming and entertainment industry, it attracts a broader range of users and consumers. The applications of VR in fields such as

healthcare, education, architecture, engineering, tourism, and training open up new user segments and create additional market opportunities. This diversification of the user base contributes to the overall growth of the VR market.

VR provides solutions to industry-specific challenges by offering immersive and realistic simulations. In the healthcare sector, VR can be used for surgical simulations, patient rehabilitation, and therapy. For instance, in 2022, XRHealth announced the availability of virtual/augmented reality treatment to treat individuals with autism in the United States. Patients in Australia have previously used ASD VR treatment to treat interest, inhibition, memory, mobility/coordination, frustration tolerance, anxiety, and stress. The XRHealth platform can also track successful therapies using the unique data insights that closed loop VR technology can provide. By addressing these challenges, VR technology becomes a valuable tool for different industries, driving its adoption and market growth. VR technology improves efficiency and reduce costs in various industries. For instance, in the automotive industry, VR allows engineers to test and refine vehicle designs virtually, minimizing the need for costly physical prototypes and iterations.

Virtual Collaboration and Remote Work

VR enables remote teams to collaborate and work together in a shared virtual environment, regardless of their physical locations. By donning VR headsets, team members can join virtual meeting rooms, share and manipulate 3D models or documents, and communicate with each other in real-time.

VR offers immersive and interactive training experiences, particularly for remote employees or those in specialized industries. It allows organizations to provide virtual training simulations, on-the-job simulations, or virtual tours, enabling employees to learn and practice skills in a safe and controlled environment. With the limitations on in-person conferences and events, VR provides an alternative for hosting virtual gatherings. Virtual conferences allow participants to join from anywhere in the world, interact with speakers and attendees, and experience presentations, panels, and exhibitions in a virtual space. For Instance, in 2022, Immerse announced the release of its latest product, 'VR in a BOX,' an all-in-one, frictionless solution for businesses eager to start their VR adventure. Each box will have a headset with pre-installed training content from the Immerse Marketplace, as well as Mobile Device Management, which will allow users to govern this content in the future. Each training app is completely linked with the Immerse Platform, allowing users to start collecting performance data immediately. SAP users will also be able to link their platform with SuccessFactors.

Technological Advancements

Advancements in hardware components such as display resolution, field of view and refresh rates have significantly enhanced the visual quality and realism of VR experiences. Higher-resolution displays minimize the screen door effect and provide sharper, more detailed images, enhancing immersion. Additionally, advancements in tracking technologies, such as inside-out and outside-in tracking systems, improve the accuracy and responsiveness of VR headsets and controllers, enhancing the overall user experience. The advancement of graphics processing units (GPUs) and rendering techniques has allowed for more detailed and realistic virtual environments. Real-time ray tracing, advanced lighting models, and improved shading techniques contribute to visually stunning and immersive VR experiences.

The introduction of wireless and standalone VR headsets has increased accessibility and convenience for users. Wireless VR systems eliminate the need for cumbersome cables, providing freedom of movement and a more immersive experience. Standalone headsets, which do not require connection to a powerful computer, have made VR more accessible to a wider audience. For Instance, in 2022, the refresh rate of Pimax's 8KX headsets has been boosted from 90Hz to 120Hz. When Pimax refers to a headset as 8K, it signifies that it has two displays, one for each eye. This indicates that the resolution of this headset is around 4k per eye, which is still quite remarkable. These Pimax headsets also have a 200-degree field of vision.

Impact of COVID-19

During the initial days the manufacturing and supply chains of VR hardware and components were impacted by the pandemic. Restrictions on manufacturing facilities, international shipping delays, and disruptions in the supply of raw materials have led to challenges in meeting demand and fulfilling orders. These disruptions have temporarily affected the availability and distribution of VR products, potentially impacting the market. But it recovered with time when the ease of restrictions and lockdowns by economies were taking place.

With lockdowns and social distancing measures in place, businesses and individuals have turned to remote work and communication solutions. VR technology has provided a means for remote collaboration, virtual meetings, and immersive communication, offering an alternative to in-person interactions. This increased demand for remote collaboration tools has driven the adoption of VR solutions in various industries,

contributing to the growth of the VR market. During the pandemic, people turned to home entertainment to overcome boredom and maintain social connections. The immersive and engaging nature of VR gaming experiences has attracted a larger audience, leading to increased demand for VR gaming devices and content. This surge in gaming and entertainment has positively impacted the VR market. Also, the limitations on in-person training and education have prompted the adoption of virtual training and educational platforms. VR technology offers immersive and interactive training simulations, allowing organizations and educational institutions to continue providing valuable learning experiences remotely.

Key Players Landscape and Outlook

Key players are heavily investing in R&D and launching a significant number of products. All companies are trying to increase their production capabilities, and many are working on optimization of their distribution channels.

For instance, in 2023, Sony Interactive Entertainment revealed the next-generation PlayStation VR 2 for the PlayStation 5 console. The new VR headset is designed to deliver enhanced visuals, better tracking, and a reformed controller with haptic feedback and adaptive triggers, providing a more immersive and tactile VR gaming experience.

Furthermore, in 2023, Meta Platforms Inc. officially announced its Quest 3 VR which is a lighter and more comfortable version of its predecessor, the Quest 2. With a “40 percent slimmer optic profile” (without taking its foam facial interface into account), a new Snapdragon chip inside has twice the graphics performance, it has 37% more pixels than Meta Quest 2 and improved peripherals and colors.

Optimized for virtual reality, the new Qualcomm Snapdragon XR2+ platform will run at 50% more power than Meta Quest 2.

The VR market is still in its early stages, but it is growing rapidly. As the market grows, we can expect to see more new players entering the market, and we can expect to see even more innovation in VR technology. In addition to the companies listed above, there are a few other smaller companies that are also active in the VR market. These companies are developing VR hardware, software, and content. As the VR market continues to grow, we can expect to see these smaller companies become more prominent.

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