

# Study of Virtual Reality: Is it actually the future????

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**Abstract-** Virtual Reality is an environment which is generated by a computer system, which includes scenes and objects that are materialized to be real. Virtual reality is a simulated environment which sometimes feels similar or fully different from the actual world.

It is a definition of virtual reality that comes from two terms: virtual and reality. In contrast to what we experience as humans, virtuality refers to something close to us. Virtual reality may refer to anything, but it usually refers to a particular type of emulation of reality.

**Keywords:** virtual reality, augmented reality, virtual environment, Scientific Visualization

## I. Introduction

VR is often defined as a technology that lets you experience something more intimately than usual in an artificial world. However, VR is much more than that.

Despite the fact that the entire VR world is simply a computer-generated image, virtual reality provides an immersive experience within the sense of being physically present in the visible world.

We perceive the world through our senses. In school we were all taught that we have five senses: taste, touch, smell, sight and hearing. There are other sense organs as well, but these are the most obvious ones. Humans actually have many more senses than this, such as a sense of balance, for example. Our brains

process sensory information in many ways, which allows us to have a rich flow of information from the environment to our minds.

Nowadays virtual reality is used in many areas like entertainment, education, business,. Apart from this VR style technology also seems in augmented reality and mixed reality, this is also known as extended reality. Virtual reality and virtual environment are very commonly used words, but there are many other words like synthetic experience, virtual world, artificial reality and so many.

## II. History

The term 'Virtual Reality' was first used by Jaron Lanier in the mid 1980's. Jaron Lanier is a founder of VPL research, he started developing the gear, including gloves and goggles, which needed to experience virtual reality. Before that also, technologists were developing a factitious environment.

In 1960, Heilig also invented a head-mounted display device and also patented by him, that device is called a tele sphere mask. Originally proposed in a 1955 essay by Morton Heilig, the Sensorama (1962) played 3D movies while air moved, accompanied by sounds, and emitted aromas to simulate a virtual sensory environment by using a head-mounted display. It was a non-computerized version of VR, followed by computerized VR and augmented reality.

In 1965, Ivan Sutherland also patented a "The Ultimate Display" which is also a head mounted device which serves as a "Window into a virtual world".

In 1970's its high time in this field and A haptic device was developed in the 1980s that enabled virtual environments to be navigated and manipulated.

In the middle of 1980s, The Virtual Interface Environment Workstation (VIEW) system is developed by the NASA Ames Research Centre to enable haptic interaction with a head-mounted device.

### III. Applications

While many people are aware of the term "virtual reality", they may not know what it can be used for. Gaming, for example, and virtual worlds are obvious applications of virtual reality, but there are a whole host of other applications - some more challenging than others.

- **Scientific Visualization:**

Molecular models and statistical results can be visualized using virtual reality in the field of scientific visualization. Computer graphics are used to represent complex ideas and scientific concepts in this field.

In scientific visualization, abstract concepts are communicated and understood by an audience. They can interact with these images, such as viewing a molecular structure from different angles or resolving problems. Scientists can visualize research theories or discuss large set of data in 3D environments using virtual reality to demonstrate methods or convey complex ideas. This includes semi-immersive and full immersion environments.

- **Education:**

Any technology cannot replace human participation totally, only they can enhance its working. Virtual reality is now being adopted on a large scale for almost all students. Nowadays virtual reality is used in education to give students real life experience of the things they are studying. The rate of understanding the topic explained with the help of VR has also increased. With the help of this student can experience the things which have happened in the past just by sitting in their classroom.

Virtual reality is also being used for practicing surgeries and procedures by medical students as well as dental students. It enable a safe and guarded environment. Using this will minimize the risk of any harm on the actual patients.

It would be very beneficial to use virtual reality in chemistry education. In practical fields like chemistry, instructors often use activities like environmental education to teach. There are several limitations to field trips, as well as challenges associated with planning and executing them. Field trips can be an invaluable tool for teaching and learning, but they have many disadvantages.

To overcome these kinds of restrictions, high-tech methods such as virtual reality (VR) devices sound like the best choice. Real field trips require human and material resources, and overseas trips are not possible.

The virtual environment (VE) can be dynamically changed through a real-time adaptive interactive mechanism (AIM), VR During academic studies and immersive experiences, emotional states can be induced.

As a result of this monitoring, a real-time model of the user's behaviour can be created, psychophysiology, or Based on their emotional state, the VE can undergo adaptive changes during runtime based on their neurophysiology.

- **Architecture:**

Virtual reality is very useful for architects to present their ideas to a client which allows clients to take a deep and detailed look at the design of the project.

With the help of VR, architects can construct a design for residential buildings, commercial buildings, and many such construction projects. Because of VR allows these projects to be visualized in this virtual environment and thus can interpret each aspect of the project.

VR is now replacing the standardized drawing for design.

The use of virtual reality technology in architecture will not be completely replaced by traditional methods until improvements are made in speed, graphics and the ability to alter designs in real-time.

In addition to affecting how architects share their work with clients, these technologies also influence how architects envision projects while working.

***Virtual reality: what role does it play in higher education?***

Higher education will benefit from virtual reality because students will have more autonomy and be able to pursue their own interests.

In some universities, researchers and degree programmes are exploring virtual reality's potential and granting students resources to become innovators. Institutions that integrate VR experiences in learning are experiencing breakthroughs that translate virtual experiences to the real world.

The use of virtual reality tools does more than just create a safe environment for students to experiment in; they also give them access to dimensions that otherwise might be impossible to test without expensive equipment and extensive training.

- **Healthcare:**

Healthcare is being transformed by VR. It was approved in November 2021 by the FDA to be used for chronic pain relief in adults

with EaseVRx, a system that utilizes cognitive behavioural therapy, attention shifting, interceptive awareness, and other techniques to help reduce chronic pain.

As surgeons practice surgery on virtual bodies and interact with medical devices in virtual reality, companies like Osso VR help them become more familiar with new devices and more proficient at implanting them. VR allows healthcare professionals to better prepare for being in the operating room - whether as a junior doctor explaining diagnoses and treatment plans, or an orthopaedic surgeon performing surgery.

VR can also be used as a tool for treating mental health issues, including PTSD and anxiety. Virtual Reality Exposure Therapy, for example, is particularly effective in treating anxiety, but there are many ways VR can be used therapeutically.

## **IV. Future**

Several years ago, many people knew little about virtual reality (VR), but today, it has become a common household subject, with many people having one way or another experienced VR.

Virtual reality is used in a wide variety of industries, ranging from medical learning to video games to the Metaverse, as new and innovative uses continue to emerge.

The virtual reality market is expected to grow exponentially in the next five years according to various market studies. This tutorial will examine the future of virtual reality based on several top research studies.

According to many industry experts, VR is poised for a massive growth in the industry's turnover and private utilization. With the increased uptake of VR in various industries, many have highlighted its potential future success. Based on the market trends and predictions of how the industry will grow in the next few years, this can be seen.

A constant application of VR technology to new industries and ideas has led to a rapid

development and update of VR technology. It is being used in private homes, retail spaces, as well as the computer gaming industry.

In 2020, VR and AR spending will reach \$18.8 billion, an increase of 78.5% over the \$10.5 billion in 2010, achieving a five-year annual growth rate of 77.0% to 2023, according to the IDC (International Data Corporation) research.

This report predicts that spending on virtual and augmented reality hardware will increase by more than half by 2021, making it the centre of digital transformation for companies and consumers.

Between 2018 and 2025, the VR and AR market is expected to grow at a CAGR of 63.3 percent, according to the Values report. CAGR of 571 billion dollars is expected for VR and AR by 2025. This growth is mostly attributed to smart devices, increased Internet connectivity, and mobile gaming.

During the projected period 2020-2025, the AR and VR market is expected to grow at a CAGR of 48.8%, according to a report by Vnyz Research. By 2025, it will generate 161.1 billion in revenue.

Considering the current and future advances in VR technology, the industry is expected to reach 35k crores by 2030, just a decade after reaching 4.8k crores

However, other estimates indicate that Europe, alongside Latin America, will be among the slowest consumers of VR products despite these enormous estimates.

VR sales in Europe are expected to reach 3.6 million units in 2021-up to 9 million units by 2025. By comparison, China is expected to buy 20.8 million units that year.

A growing market for AR and VR will result from increasing acceptance, and a growing responsiveness to the technology. As AR and

VR combine, a mixed reality will be created that can be used for a variety of purposes. Besides technological advancements, tablets, computers, and smartphones have become increasingly popular, additionally, there is an excessive concentration of major tech players in the AR and VR fields.

In addition to transforming the delivery of educational content, virtual reality can change how people learn. Immersive virtual reality can be used for many purposes, including virtual field trips to distant or inaccessible locations, creating content on any subject, or learning complex material through practical exercises.

A number of universities are exploring the technology's potential in other ways, including funding new research and degree programmes, as well as allocating resources to promote innovation on their campuses. Universities bringing virtual reality experiences to their campuses are witnessing breakthroughs that far surpass what can be achieved in a virtual environment.

Students benefit from virtual reality tools not only because they create a safer environment for experimentation, but because they also gain insight into dimensions they may not otherwise be able to survey without expensive equipment.

### ***Obstacles in future:***

It is quite evident that VR and AR will dominate computing in the near future. They have already improved reality with their fun and useful products. Their inventions will soon be out of this world.

Nonetheless, competition is going to be fierce, especially within the gaming community. Loyal PC and console users will not drop their favourite devices unless VR headsets, for example, can supply the same, if not better, entertainment.

It presents another reason for people to stay with their old and perfectly functional devices. If virtual and augmented reality

products cost a fortune for manufacturers and consumers, they will be reluctant to use them. Last but not least, health risks are a major barrier VR will have to overcome more than AR. Today, headsets cause headaches and neck strain, as well as dizziness, nausea, and headaches. Additionally, just 20 minutes in a virtual world can affect your perception of reality. Taking long and frequent breaks is the best solution. However, how likely is it those gamers will follow that advice?

## V. Conclusion

Assuming the figures and the various conclusions offered by well-respected companies throughout the world, it observed that Virtual Reality is going to stay here, which is certainly something to celebrate if you are a fan of the technology.

It is easy to see why VR has been gaining popularity over the last few years given the advancements in technology and how it has been adopted into industries. However, we must also ask: what will happen when VR becomes more mainstream?

Isn't the novelty of VR going to wear off once it becomes a part of nearly every industry or aspect of our lives?

No matter what, we can't deny the wonderful experiences this technology provides, the benefits it brings to research's in medical field, and the joy it has in the gaming. Because of this, Rather than worrying about the future, we should just enjoy it.

We can learn about history, cities, and landscapes through VR/ In the area of marketing and PR, VR offers fascinating solutions that inspire your customers, and it offers new possibilities to experience history, cities, and landscapes.

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