WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

How Virtual Reality Technology will Change Us

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A B S T R A C T

Virtual Reality (VR) is an environment which is computer-generated with objects and scenes which appears to be real, making the person feel they are immersed in their surroundings. Virtual Reality headset or helmet is used to perceive this environment. Virtual reality allows us to surround ourselves in video games as if we were one of the characters, improve the quality of sports training to maximize performance or, learn how to perform heart surgery.This may seem futuristic, but its origins are not as recent as we think. the first of the virtual reality device was called as Sensorama, it was a machine with built-in seat which showed 3D movies, generated vibrations and gave off odours to make the experience as realistic as possible.

Keywords: Virtual Reality, Quantitative Research

1. Introduction

Researchers in Silicon Valley began working on virtual reality in 1985. They attempted to delve into the realm of virtual reality. However, the science fiction film 'The Matrix' brought it to public attention in 1999. Following that, the idea of virtual reality piqued the imagination of average people, who find it interesting and entertaining. Virtual reality, which was once only used in literature, has now come to life as a form with the passing of time.

Virtual reality uses computer technology to construct a three-dimensional image, giving it a lifelike experience. It is made up of a variety of electronic devices that are capable of creating numerous projected worlds that fool the human brain into thinking the images are real. Wearing gloves with cameras, a helmet, or other machinery that generates realistic images is part of the equipment.

The technology assists in monitoring the user's actions in order to make them feel like they are a part of the computer-generated world. The use of two LCD monitors creates the illusion of depth. Virtual reality allows people to fly to new locations without having to leave their homes.

The head-mounted display is the most readily identifiable feature of Virtual Reality (HMD). Humans are visual beings, and the display technology that distinguishes interactive Virtual Reality systems from conventional user interfaces is often the most important difference. CAVE automatic virtual worlds, for example, actively project virtual content onto room-sized displays. Market and industrial wearables are the wild west, though they're fun for people in colleges and big laboratories.

The future of wearables is unfolding, but it is still uncertain, due to a multitude of new hardware and software choices. The HTC Vive Pro Eye, Oculus Search, and Playstation VR are leading the way, but Google, Apple, Samsung, Lenovo, and others may surprise the industry with new levels of immersion and usability. Whoever wins, the ease of purchasing a helmet-sized unit that can be used in a living room, workplace, or factory floor has pushed HMDs to the forefront of Virtual Reality technology.

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2. Review of Literature

Although virtual reality appears to be firmly founded in the twenty-first century, it actually dates back to the 1930s. It's interesting to watch the transition from science fiction fantasy to, well, reality. This timeline, taken from the study "Virtual and Augmented Reality: Technologies and Global Markets," highlights some key points.

In the 1930s, Stanley G. Weinbaum proposed virtual reality in his storey "Pygmalion's Spectacles," which portrayed a pair of goggles that enabled the wearer to experience a fictional environment through holographics–three-dimensional images generated with photographic projection, taste, smell, and touch. Stanley's description of the goggles' experience is eerily similar to the present and emerging virtual reality experience, making him a pioneer in the field.MortonHeilig, a cinematographer, created the Sensorama in the mid-1950s, which was one of the first examples of immersive, multi-sensory (now known as multimodal) technology.

In 1960, Heilig'sTelesphere Mask, which provided stereoscopic 3D and wide vision with stereo sound, was the first VR head-mounted display (HMD).The military built Headsight to allow for realistic viewing in an uncertain situation, but it was not designed for virtual reality applications.

In 1965, Ivan Sutherland created the Ultimate Monitor, a head-mounted display that could replicate reality to the point that the actual and virtual worlds were indistinguishable.The virtual world was developed and maintained in real time using computer hardware, and users could interact with objects in the virtual world in a realistic way.

In 1968, Sutherland and his student Bob Sproull created the first AR/VR system, the Sword of Damocles, which featured a head-mounted display suspended from the ceiling.

In 1969, Myron Krueger, a virtual reality programming artist and one of the first-generation virtual and augmented reality researchers, created a series of artificial reality experiences in which he created a computer-generated world that responded to people.

Even after many changes in virtual reality's growth, Jaron Lanier, the founder of the Visual Programming Lab (VPL), coined the word "virtual reality" in 1987 to describe the industry. Lanier created a variety of virtual reality gear through VPL Testing, including the DataGlove and the EyePhone head-mounted display, which were major advances in the field.

In 1974, Myron Krueger invented Videoplace, a projection device with video cameras that created shadows on a screen. It demonstrated the capacity of users to engage in an immersive environment. Tom Caudell, a Boeing scholar, coined the word "Augmented Reality" in 1990. Then, in 1992, Louis Rosenburg of the Armstrong Flight Research Center of the United States Air Force developed the first operative AR robotic device, which he dubbed Virtual Fixtures. This was a forerunner to today's virtual reality applications.

Virtual reality systems became commercially available in the early 1990s, but the technology was still prohibitively costly for most people. Virtuality Group, based in the United Kingdom, then released a series of arcade games and machines that allowed players to wear VR goggles and play on gaming machines with real-time immersive stereoscopic 3D visuals. Brett Leonard's science-fiction action-horror film "The Lawnmower Man" introduced the idea of virtual reality to a broader audience in 1992. Jaron Lanier, the creator of virtual reality, and his early laboratory works were featured in part of the film.

The film used real virtual reality equipment from VPL Research Laboratories, and the producer, Brett Leonard, said he was inspired about companies like VPL.

At the Consumer Electronics Show in 1993, Sega introduced the Sega VR headset for the Sega Genesis console. A head monitoring system with wrap-around stereo sound and LCD displays was included in the headset prototype. Sega planned to sell the game for about $200 in 1993, which would be equivalent to $322 in 2015. Despite four games being created for it, the platform remained in the development process due to technical difficulties.

Dancing in Cyberspace, the first theatre production to use virtual reality, premiered in 1994. Acrobats performed on stage in and around virtual objects at the theatre.

In 1995, The Nintendo Virtual Boy (also known as the VR-32) was released. It was a 3D gaming console that was sold as the world's first handheld console capable of displaying true 3D graphics. Despite price declines, the product was a commercial failure when it was first launched in Japan and North America for $180. The lack of colour graphics (the games could only show red graphics on a black background), software support, and difficulty using the console in a comfortable position were the key reasons for this failure. Nintendo ceased making and selling the game the next year.

In 1998, Sportsvision used the 1st and Ten line computer system, which demonstrated the first virtual yellow first down marker during a live National Football League game; this is now a staple in all televised football games and marks an important moment in AR history. NASA then used AR technology to improve navigation by their X-38 spacecraft in 1999, using a hybrid synthetic vision system.

In 1999, The film "The Matrix" was directed by Lana Wachowski and Lilly Wachowski, two American film directors, screenwriters, and producers. The film depicts characters who live in a fully artificial universe, many of whom are entirely unaware that they are not in reality. The film "The Matrix" had a huge cultural influence and popularised the concept of simulated reality.

In 2000, Hirokazu Kato of the Nara Institute of Science and Technology in Japan founded ARToolKit. In 2009, ARToolKit brought virtual reality to web browsers.

Augmented reality has come a long way since its inception, and recent developments have been even more exciting. Over the past 15 years, virtual reality and augmented reality developments have advanced dramatically. As prices have dropped, compact and reliable mobile technologies, in particular, have grown in popularity.

Over the last two decades, the industry has benefited greatly from the impressive growth of VR and AR in gaming and other applications. The acquisition of Oculus by Facebook in 2014 was a game-changer for the virtual reality industry. Google and other big tech firms have launched interim virtual reality goggles, such as the DIY headset, which works with Google Cardboard and Google Daydream on smartphones. Samsung has taken this idea a step further with products like the Galaxy Gear, which includes smart features like gesture control. The next several years appear to be critical for the VR and AR industries.

3. Method and Materials

Secondary quantitative research method was performed for this paper. Secondary research is a kind of research that involves using pre-existing data. Secondary research includes research articles published in research reports or journals. These documents are often made available on the net or offline by libraries, websites and so on. . Secondary research method involves re-analysing past data. Secondary research also includes: 1. Online Data, 2. Data from Government and Non-government Archives, 3.Data from Libraries, 4. Data from Institutions of Learning.

Advantages of Secondary Research–

- Easily Accessible
- Secondary research is cost-effective.
- It is not time consuming.
- It helps researchers to identify knowledge gaps which can be used as the basis of further systematic investigation.
- It is useful for scaling the scope of research & setting the stage for field investigations.

4. Data and Results

Virtual reality technology is used in almost every field, some of the fields are:

- **Automotive industry**

Until commissioning costly prototypes, engineers and designers can easily play with the look and construction of a vehicle using virtual reality. VR is now being used by companies like BMW and Jaguar Land Rover to perform early design and engineering reviews to verify the vehicle's visual design and object obscuration - all before any money is spent on physically producing the components.

By that the number of prototypes designed per vehicle line, virtual reality is saving the automotive industry millions of dollars.

- **Healthcare**

Healthcare is an important application in which virtual reality can have a significant impact. Digital models are now used by healthcare professionals to train for operating on real bodies, and VR has also been used to treat burn injuries.

Virtual reality can also be used to treat mental illnesses, with Virtual Reality Exposure Therapy being especially helpful in the treatment of PTSD and anxiety. There are several other ways that spending time in virtual reality can be therapeutic.

- **Architecture**

Virtual reality is increasingly altering how architects design and experiment with their work. Virtual reality allows users to see not just how a building or room will look, but also how it will feel. Homeowners can interact with the room before it is designed and make adjustments in real time, saving both the consumer and the architect time and money (as well as increasing satisfaction on completion of the project).

Architects have been using 3D models for years, but interactive tools like Iris VR allow them to fully comprehend and explore the environment.

- **Entertainment**

In the entertainment industry, VR is being used to enhance 360-degree film interactions (examples on YouTube) and improve your emotional interaction with them and/or the characters. For example, Disney Movies VR transports users to red carpet events and an interview with the cast of "The Jungle Book."

VR has the potential to change the way media content is created. Flipside is now the easiest way to create shows that can be watched on traditional sites such as Twitter, Twitch, and Facebook Live, as well as inside virtual reality.

- **Education**

VR has the potential to transform education by allowing students to learn in a more immersive and experiential way. Users will take a tour of Ancient Rome, discover the human brain, and board the Titanic using Unimersiv software. With their 'Engage' product, ImmersiveVREducation is creating a virtual reality classroom / meeting room space where people can learn from lecturers all over the world.

- **Sports**

With many VR companies specialising in watching live sporting events, the way we watch sports is already evolving. For example, you can watch NBA, NFL, and other sporting events in virtual reality. Broadcasters and sports teams may use companies like LiveLikeVR to offer live sports viewing experiences on mobile VR.

This is a fantastic way to bring live sporting events to people who can't get to the stadium or can't afford to pay for tickets to see the games in person.

The UEFA Champions League final was broadcast in 360 degree VR for free on YouTube and the BT VR app by BT Sport. As if you were in the arena, you could watch the game from a variety of locations. Initiatives like this can continue to transform the way people watch sports.

- **Social**

High Fidelity, vTime, AltspaceVR, Oculus Rooms and Parties, and VRChat are only a few of the VR companies that are already forming social communities. Altspace is one of the most popular, with meetups on topics ranging from 'Mingle and Chill' to 'Boss Monster' to 'Lia's birthday drawing party.'

- **Recreation**

Many real-life hobbies are available in VR, and the immersive environment enhances their enjoyment and accessibility. If you love cultural experiences, you can visit museums like the Natural History Museum in London, or if you want thrills, a virtual reality theme park is scheduled to open in China.

Galatea, which provides a writing and narrative design management platform for immersive storytelling, is one of the most innovative ways VR is being used.

- **Law enforcement**

Police departments, like the military, are using augmented reality and virtual reality (AR/VR) technologies from companies like VirTra to train officers in simulated environments that include visual, auditory, and physical stimuli (ranging from barking dogs and street noise to the recoil of discharging a weapon).

The technologies also allow police forces to escalate or de-escalate trainees' simulated encounters with individuals inside virtual training settings, enabling learners to practise making important decisions and judgement calls under pressure.

During virtual reality police training, a group of University of Alabama researchers worked with law enforcement officers to test brain waves. According to one of the lead researchers, the results could "improve officer preparation and have a positive effect on the recruiting process."

- **News and journalism**

You can now watch news stories and documentaries in VR. The New York Times has already entered this space, and it's only a matter of time before other media outlets join them. In the NYTVR app, you can experience stories rather than just listen to them, as if you were standing opposite the journalist where the story is happening.

- **Gaming**

Virtual reality's strength comes from the fact that it deceives the subconscious and makes it unable to differentiate between actual and stimulating worlds. Despite the fact that the consumer is just playing a game, the subconscious adapts to the new surroundings as if they were real. The fight or flight response that is elicited is genuine. (In stressful circumstances, the brain either activates a fight or flight reaction, in which the person stays put to fight the situation or attempts to flee the situation.) For example, when wearing the Oculus Rift Headset and playing a game, the user tends to duck at objects thrown at him. The use of virtual reality in technology has altered how children interact with games. Gaming has evolved into something that is more serious, immersive, and even spectacular.

VR is likely to influence your workplace, hobbies and social life in the future – and that's sooner than you may think. The possibilities of VR are endless; the only things we can't replace in VR are eating and sleeping… for now.

5. Conclusion

In today's industry, consumers are searching for applications that go beyond recreation, tourism, or marketing and are more cost-effective. Virtual interfaces must also be improved to prevent flaws like clipping, which causes solid objects to look as though they can be pushed through. Or to reduce the detrimental effects that VR has on people, such as motion sickness, which is a dizziness triggered by a discrepancy between our body's movement and what we see in the virtual world.

The major tech companies are already working on headsets that don't need cables and can display images in high definition. They're working on 8K Virtual Reality headsets with a lot of features.

They're working on Virtual Reality headsets that are 8K resolution and have far more powerful processors. There is also hope that Artificial Intelligence will be implemented within the next few years. The latest 5G norm may also open up new possibilities for the evolution of virtual reality. More devices and large user groups will be able to communicate thanks to this standard. Furthermore, due to its near-zero latency, users would be able to receive pictures in real time, almost as if they were seeing them with their own eyes. As a result, Virtual Reality is no longer considered science fiction. It has become a part of our daily lives, and in the coming years, it will contribute to developments that will shape the future.

Acknowledgement

I would like to express my special thanks of gratitude to all my teachers for their able guidance and support in completing my research.

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