Virtual Reality

**Abstract - Virtual Reality (VR) is a computer-based technology that uses specialized input and output devices to allow users to interact with and experience an artificial environment as if it were the actual one. The user of a virtual reality system can explore a three-dimensional virtual or artificial world and interact with lifelike features developed by the creator. A user can create a routine in the virtual world. The Desktop Virtual Reality Tools, the various VR operating systems, VR operating Shells, VR Displays, System Requirements, Application, and major aspects of VR were discussed in this review study.**

**Keywords -** *Virtual reality, system requirements, important features, and application*

**What is Virtual Reality?**

Virtual Reality (VR) is the creation of a virtual world using computer technologies. VR, in contrast to traditional user interfaces, immerses the user in an experience. Instead than looking at a screen, users are immersed in 3D environments and may interact with them. The computer is converted into a gatekeeper to this artificial world by replicating as many senses as possible, including as vision, hearing, touch, and even smell. Near-real VR experiences are only limited by the availability of content and the low cost of processing power.

**What is the purpose of Virtual Reality?**

Virtual reality is being utilized to create immersive experiences that can both educate and amuse customers. Virtual reality is used in a range of fields, including health, architecture, the military, and others, in addition to gaming.

Virtual reality is swiftly gaining traction in practically every profitable industry trying to future-proof and upgrade their product offerings. Virtual reality serves a variety of purposes, depending on the industry. The potential of virtual reality are boundless, from utilizing it to enhance learning and growth in schools to providing an environment for medical professionals to hone their competence in preparation for surgery**.**

**How is Virtual Reality Achieved?**

Despite the fact that we discuss a few historical early types of virtual reality elsewhere on the site, virtual reality is most often applied nowadays utilizing computer technology. For this, a variety of solutions are utilized, including headphones, Omni-directional treadmills, and customized gloves. These are utilized to engage all of our senses at the same time in order to create the illusion of reality.

Because our senses and brains have evolved to present us with a highly synchronized and filtered experience, this is more challenging than it appears. We can typically detect if something isn't quite right. This is when concepts like "immersiveness" and "realism" may come up in conversation. Partially technological, partly philosophical challenges separate convincing or delightful virtual reality encounters from jarring or unpleasant ones. Virtual reality technologies must take into account human physiology. The human visual field, for example, does not resemble a video frame. We have (about) 180 degrees of vision, and even if you aren't always aware of your peripheral vision, you would notice if it was gone. Similarly, motion sickness can be caused when your eyes and your vestibular system in your ears disagree. This is what happens to some individuals on boats or in cars while they read.

A sensation of presence is achieved when a virtual reality system succeeds to get the correct balance of hardware, software, and sensory synchrony. When the individual has a strong sense of being present in the surroundings.

**Virtual Reality Technology**

The head-mounted display is the most instantly recognized component of virtual reality (HMD). Humans are visual animals, and the most significant distinction between immersive Virtual Reality systems and standard user interfaces is frequently display technology. CAVE autonomous virtual environments, for example, actively display virtual material on room-sized displays. Consumer and industrial wearables are the Wild West, but they are enjoyable for individuals in colleges and huge labs.

The future of wearables is unfolding, but it is yet uncertain, thanks to a plethora of new hardware and software alternatives. The HTC Vive Pro Eye, Oculus Quest, and PlayStation VR are leading the way, but Google, Apple, Samsung, Lenovo, and others might surprise the industry with new levels of realism and usefulness. Whoever wins, the ease of purchasing a helmet-sized gadget that can be used in a living room, workplace, or factory floor has pushed HMDs to the forefront of Virtual Reality technology.

**Virtual Reality Software**

1. **What is Virtual Reality Software?**

A virtual reality (VR) environment is a fully 3D environment built using a mix of software and appropriate hardware. The user is entirely immersed in the 3D environment, allowing them to interact with the virtual world in a realistic manner.

To build an excellent VR user experience, a few distinct processes are necessary. Software developers construct the virtual environment, which is subsequently produced so that users may interact with the things developed by the developers. Users can wear headsets to provide the impression of being entirely involved in a 3D world. These 3D objects react to changes in the user's movement, and the interactions are similar to those seen in the real world. Additional hardware, such as gloves or other room furnishings, can be used to imitate additional sensations, such as touch.

1. **Why use Virtual Reality (VR) Software?**

Businesses are seeing the potential of virtual reality in the workplace as it becomes more ubiquitous. Users in a variety of disciplines can profit from this technology in various ways.

* **Virtual Test out a product:** VR has the potential to be transformative for businesses that sell products since it allows people to imagine what it would be like to own the goods. Before making a purchase, customers can give a product a "virtual test drive."
* **Expand Education:** VR has the potential to take hands-on learning to new heights. A student or trainee might picture oneself executing a task rather than watching an instructor do it.
* **Go one step past 3D Modelling:** In a virtual reality environment, several VR technologies allow users to design, sculpt, model, paint, and construct actual items. With tools like this, users may interact with 3D objects from any perspective.

1. **Who uses** **Virtual Reality (VR) Software?**

Virtual reality is proven to be increasingly useful in a variety of sectors. The examples below are just a handful:

* **Game Developers:** Within the game creation industry, virtual reality is quickly gaining traction. VR tools may be used by developers to provide a fully immersive user experience for gamers. The game allows players to engage with the generated characters as if they were real people. These games are often accessed via headphones or mobile devices.
* **Architects and Engineers:** 3D design is becoming more popular in architecture and engineering because it allows users to alter objects from all angles. Users may fully immerse themselves in the surroundings while developing in VR. These technologies have enhanced CAD software's 3D capabilities, allowing users to create, alter, and collaborate on projects virtually.

1. **Kinds of Virtual Reality (VR) Software**

Because virtual reality is such a new technology, its various subcategories are still developing. The following are some of the most common subcategories in the area:

* **VR Visualization:** Users can interact with aggregated data in a virtual environment with this programme. These technologies allow consumers to examine analytics in a way that allows them to completely comprehend what the data is saying.
* **VR Content Management Systems:** These solutions may be used by businesses to gather, store, and analyze all VR material in one place.
* **VR SDK:** Virtual reality software development kits (SDK) give developers the tools they need to create, test, and improve virtual reality experiences. Virtual reality software development kits (SDKs) serve as the foundation for virtually every VR experience.
* **VR Game Engine:** This programme gives developers the tools they need to make a virtual reality game.
* **VR Social Platforms:** These tools allow users to collaborate in virtual reality from afar.
* **VR Training Simulator:** These technologies may be used to teach staff in a fully immersive environment in practically any business.

1. **Virtual Reality (VR) Software Features**

VR software comes with a variety of capabilities that allow users to build a full-fledged VR experience. The characteristics listed below are prevalent in these sorts of systems, although they are not necessarily guaranteed to be included.

* **Content Management:** Many programmes enable users to submit either raw 3D content to be altered into a VR experience later or current VR content to be uploaded straight to the platform. These systems let users to manage and store material, as well as publish directly from them.
* **Editing Content:** Editing skills are available in the great majority of VR systems. Users may makechanges to either raw 3D content or current virtual reality experiences. Some editing options include drag-and-drop, allowing users to make changes to their VR material with little to no coding knowledge.
* **Hardware Integration:** Any VR solution must be compatible with gear that allows for VR experiences. These devices are usually headsets, although they can also be phones.
* **Collaboration:** Multiple users may access the solution remotely at the same time via VR capabilities, allowing them to interact in real time. Users should be able to interact on the same items at the same time while collaborating, as well as watch games or events together.
* **Analytics:** Users will be able to get analytics through some VR solutions. It will enable businesses to have a better understanding of how people interact with VR content.

1. **Trends Related to Virtual Reality (VR) Software**

* **360 –degree Video:** These are videos in which a certain view is exhibited from every angle, resulting in a fully immersive VR experience. According to studies, user interaction with 360-degree movies is rapidly increasing, indicating that 360-degree videos will become more widely used.
* **Increased Availability:** Oculus and HTC, two major VR companies, have openly said that they are striving to lower the price of their headsets. We will undoubtedly see a more mainstream use of VR technologies as prices become more reasonable.
* **More jobs in the VR field:** As a technology, virtual reality is still evolving, and talented developers are needed to help it reach its full potential. There will be a bigger need for more VR developers as the software and integrated hardware become more in demand by the general population. In the next years, expect to see more job postings in the virtual reality field on employment sites.

1. **Potential Issues with Virtual Reality (VR) Software**

While we may anticipate VR software and headsets to become cheaper in the near future, the technology's largest barrier right now is cost. Because VR software and hardware are still so expensive, customers have only had sporadic experiences with it. As a result, people are unable to envision use cases that are relevant to their employment and everyday lives.

1. **Software and Services Related to Virtual Reality (VR) Software**

A lot of the time, virtual reality and augmented reality go hand in hand (AR). AR software effortlessly merges a 3D-generated item into the actual environment. Mixed reality (MR) is a sort of technology that combines VR and AR by allowing users to see virtual things in real-world situations while anchoring the objects to a point in actual space.

**Virtual Reality Hardware**

In the last three years, virtual reality gear has exploded. They range from simple housings for a pair of lenses to entire headsets with built-in displays that provide a 110-degree field of vision. Each gadget has its own set of benefits and applications. Many have even fallen in price dramatically in the last year, making them more accessible to a broader range of consumers. The following is a quick rundown of each gadget, sorted by price and complexity:

1. **Google Cardboard:**

* Cardboard VR may be used with a broad variety of modern smartphones.
* The main advantages of Google Cardboard are its low cost, extensive device support, and mobility. It's also Wi-Fi, which is a plus.
* The VR applications can monitor the user in 360 degrees of rotation using the phone's gyroscopes.
* Modern phones are powerful, but not as powerful as desktop computers. The user, on the other hand, is untethered, and the systems are light.

1. **Google Daydream:**

* The Daydream is made of a fabric-like material rather than plastic, and it comes with a Wii-style motion controller with a touchpad and buttons.
* It has better optics than a Cardboard, but it is not as great as higher-end VR systems.
* It only works with a limited number of phones, just as the Gear VR.

1. **Gear VR:** The Oculus ecosystem includes Gear VR. While the Gear VR Head-Mounted Display (HMD) still needs a smartphone (Samsung exclusively), it features part of the same technology as the Oculus Rift PC solution. When compared to Google Cardboard, this results in significantly more responsive and improved tracking, however it still just detects rotation.
2. **Oculus Rift:**

* The Oculus Rift is the platform that, thanks to a successful Kickstarter campaign, sparked the VR renaissance. The Rift is powered by a computer and external cameras that allow for both rotational and positional tracking, giving the user a complete VR experience. Because of their partnership with Samsung, Oculus may utilize Samsung displays in its virtual reality headsets.
* While the Oculus no longer requires users to be sitting, it still need them to move inside a 3 m x 3 m space. The Rift HMD is connected to the computer through USB.
* The bundled Xbox gamepad, mouse, and keyboard, as well as a one-button clicker and proprietary wireless controllers, may be used to interact with the VR world.

1. **Vive:**

* HTC smartphone panels are used in the HTC Vive by Valve.
* The Vive uses its own unique wireless controllers that are separate from those used by Oculus (though it can also utilize gamepads, joysticks, and mouse/keyboards).
* The Vive's most notable feature is that it invites users to explore and wander within a 4 m × 4 m (or bigger) cube.

1. **Sony PSVR:**

* Despite continuous reports of an Xbox VR HMD, Sony is the only video game system having a VR HMD at the moment.
* It's faster to set up and install than a PC-based VR system, and while the collection of titles is significantly fewer, the general quality of the titles is greater. It's also the most cost-effective of the VR alternatives for positional tracking. It is, however, the only one that a typical hobbyist developer cannot work on.

1. **Microsoft’s HoloLens:**

* In numerous aspects, Microsoft's HoloLens offers a unique augmented reality experience.
* The user is not cut off from the outside world; through the HMD's semitransparent optics, they can see other people, desks, chairs, and other objects.
* The HoloLens detects the user's surroundings and develops a three-dimensional image of it. This enables the HoloLens' holograms to interact with the things in the room. Holographic figures may sit on the room's couches, fish can avoid table legs, and screens can be installed on the room's walls, among other things.
* The entire system is wireless. It's the only commercially available wireless positioning tracking gadget. The computer is embedded within the HMD and has processing capability that falls between that of a smartphone and that of a VR-ready PC.
* The user can walk in regions up to 30 m x 30 m untethered.
* While an Xbox controller and a custom single-button controller may be used, the HoloLens is mostly controlled by voice commands and two hand gestures (Select and Go back).
* The final distinction is that holograms only appear in a limited area of view.
* Because users can still see other individuals, whether they are sharing the same Holographic projections or not, they may engage with them in a more natural way.

**Why have Virtual Reality?**

This may appear to be a significant amount of work, and it is! What makes virtual reality development worthwhile? The potential for entertainment is obvious. Films and video games that immerse you are good examples. After all, the entertainment sector is a multibillion-dollar business, and customers are continuously looking for new things. Virtual reality offers a wide range of other, more serious uses.

Virtual reality may be used for a broad range of purposes, including:

* Architecture
* The Arts
* Medicine
* Entertainment
* Sports

Virtual reality has the potential to lead to fresh and interesting discoveries in various fields, which will have an influence on our daily lives.

Wherever doing anything in real life is too risky, costly, or impractical, virtual reality is the solution. Virtual reality allows us to take virtual risks in order to earn real-world experience, from trainee jet pilots to medical applications training surgeons. As the cost of virtual reality decreases and it becomes more common, more significant applications, such as education and productivity, will emerge. Virtual reality and its cousin, augmented reality, have the potential to fundamentally alter how we interact with our digital devices. Keeping the trend of humanizing technology alive.

**Types of Virtual Reality**

Non-immersive VR, semi-immersive VR, fully immersive VR, and collaborative VR simulations are the four primary forms of virtual reality being utilized to modify the world around us today.

Let's break down the different forms of virtual reality and look at instances of each to have a better grasp of how it's utilized:

1. **Non - Immersive Virtual Reality:**

* Non-immersive virtual reality is a computer-based virtual reality experience in which you can control some characters or activities within the software but the environment does not interact with you directly.
* When you play video games like World of Warcraft, for example, you may control characters who have their own movements and traits.
* Although you are interacting with a virtual environment, you are not the game's center of attention.
* All of the actions or features interact with the characters within the game.
* As a result, all basic gaming devices, such as the PlayStation, Xbox, and computer, provide a non-immersive virtual reality experience.
* However, in 2017, the US Defense Department stated that strategic games might aid in the development of the US Army's planning and strategic competence.
* Since the summer of 2018, this has been put to good use.

1. **Fully – Immersive Virtual Reality:**

* In contrast to non-immersive virtual reality, fully immersive virtual reality guarantees a realistic experience in the virtual world.
* It will give you the impression that you are there in that virtual environment, and that everything is occurring to you in real time.
* Helmets, gloves, and body connections with sense detectors are used in this pricey kind of virtual reality.
* These are linked to a high-performance computer. The virtual environment detects and projects your motions, reactions, and even a blink of an eye.
* You will feel as though you are literally present in the virtual environment.
* A Virtual Shooter game zone, for example, may be a small area where you are outfitted with gear and viewing a virtual environment through a helmet while confronting other shooters attempting to kill you.
* Within the game, you will move your arms and body to sprint, leap, crouch, shoot, throw, and many more actions.
* Neurosurgeons are being trained in a novel idea of virtual medical training in order to minimize mishaps during dangerous brain procedures.
* Many more similar notions are gaining traction, with the promise of improving our lives.
* Virtual reality that is totally immersive is expensive and not commonly available currently.

1. **Semi – Immersive Virtual Reality:**

* Virtual reality that is semi-immersive is a hybrid of non-immersive and fully immersive virtual reality.
* This can take the shape of a 3D area or virtual world in which you can freely roam about using a computer screen or a VR box/headset.
* As a result, all actions in the virtual world are focused on you.
* However, except from your visual perception, you have no genuine muscular motions.
* On a computer, you can navigate about the virtual area with the mouse, while on a mobile device, you can swipe and touch to move around.
* Gyroscope is supported by the majority of semi-immersive virtual environments, which means the virtual space will be fixed on your phone based on the vertical axis, and you will have to physically move your phone in other directions to observe the virtual world in those directions.
* Swiping isn't going to work.
* The ones that are linked to VR boxes are more engaging since they are a type of gyroscope that does not require you to use your hands.
* Even if you look out the corner of your eye while wearing a VR box/headset, you will only be able to view the virtual environment and not your actual world. As a result, a genuine experience is created.
* After non-immersive virtual reality, semi-immersive virtual reality is the most cost-effective and widely utilized of all virtual reality types.
* Virtual tours are the most common type of semi-immersive virtual reality that most companies are using nowadays.
* They can be web-based or device-based. They give an engaging virtual experience in general.
* It is primarily utilized in companies that rely on emphasizing and advertising their locations, such as real estate websites, hotels, local bars or pubs, universities, schools, and a variety of other enterprises.

1. **Collaborative Virtual Reality**

* This is a type of virtual world in which individuals from all over the world may interact in a virtual environment, primarily through the use of 3D or projected characters.
* For instance, in the video game PUBG (Players Unknown Battleground), a large number of players are transformed into distinct virtual characters that they may manage.
* They can communicate with one another using microphones, headphones, and talking.
* People have recently become accustomed to using virtual conference rooms to conduct business meetings or virtual debating tournaments.
* The major purpose of this type of VR is to encourage individuals to work together.

**Features of Virtual Reality Systems**

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* People have recently become accustomed to using virtual conference rooms to conduct business meetings or virtual debating tournaments.
* The major purpose of this type of VR is to encourage individuals to work together.
* As the user investigates their surroundings, a virtual environment should deliver suitable reactions — in real time. The issues develop when there is a lag between the person's actions and the system's reaction, also known as latency, which interrupts the person's experience. The individual recognizes that they are in an artificial setting and modifies their behavior appropriately, resulting in a stilted, mechanical encounter.
* The goal is to create a natural, free-flowing kind of connection that will leave a lasting impression.

**What function does virtual reality play in specialized role training?**

Many professions need specialized training and abilities in order to succeed in the most detailed or demanding tasks. Surgeons and military defense roles, for example, frequently need training that, if not done correctly, might put people's lives in jeopardy. It's no surprise that professions like these have swiftly embraced virtual reality simulation technologies to improve skill sets and eliminate the risk of a real-life bad consequence.

Another big benefit of virtual reality in these fields is that it allows individuals to attend seminars and examinations from all over the world. Travel is typically a significant expenditure for businesses and organizations, and it necessitates dedication and strict adherence to schedules, which can result in significant delays in the completion of tasks. Users can engage with professors, other students, or teams using virtual reality headgear, and even perform activities and examinations in a learning environment utilizing 3D immersive virtual reality software.

Volkswagen employees, for example, had to travel long distances to undergo training at their facilities. However, with the introduction of virtual reality, the organization has been able to teach employees more successfully by providing virtual lessons that can be attended at any time and from any location using convenient VR headsets and VR gloves.

**What role does virtual reality play in exposure therapy?**

The patient is exposed to a scenario or setting that causes them fear or anxiety in a controlled manner during exposure treatment. This treatment uses virtual reality to immerse the patient in a real-life virtual setting where their fear is revealed in a controlled manner. Many patients are able to address the root of the problem and conquer their worries while maintaining a sense of safety with this strategy.

The treatment of claustrophobia, PTSD, social anxiety, the fear of driving, and the fear of flying, to mention a few, are all examples of VR being utilized in exposure therapy.

**Pros of Virtual Reality**

* **Better than Reality:** Visuals in virtual reality are significantly superior to those in reality. In video games, virtual reality technology is utilized to give the user the impression that he is in another world. Vibrations and other sensations have been sent in video games using a VR game controller. VR has merged the use of sound and images in video. Furthermore, it provides the user with a positive gaming experience. Users may also obtain real-life game experiences, such as combating zombies.
* **Used in Various Fields:** Virtual reality has been employed in a variety of industries, including the military, education, and health care, due to its wide capabilities. It expands the range of possibilities in a variety of sectors. In aviation and architecture, virtual reality is utilized to observe the finished project.
* **Users have Awesome Experience:** Virtual reality has provided users with incredible experiences. The VR technology gives users the impression that they are in real places, hearing genuine noises, and seeing real sights. Many people have the desire to use virtual reality technologies more frequently. Disabled people hold it in great regard. They can explore the actual world through virtual reality. Films made for virtual reality allow viewers to see the entire environment in each scene. As a result, it provides spectators with an interactive watching experience.
* **Give detail view:** Virtual reality provides a comprehensive and complete perspective of a location. Virtual reality, for example, makes tourism attractions more fascinating and accessible. It provides a thorough glimpse of a location you wish to visit. As a result, viewers may plan their journey by seeing the actual sites. Furthermore, users may view essential landmarks as well as important areas that they want to visit.
* **Connect with People:** Virtual reality allows you to communicate with people you would never meet in real life. It aids in the formation of new relationships in a more efficient manner than in real life. Users learned about all sorts of individuals and were able to interact with them.
* **Effective Communications:** Effective communication is one of the key advantages of virtual reality. Users can speak with one another and therefore enjoy one other's company. It provides a new way of interacting with people.

**Cons of Virtual Reality**

* **High Cost:** One of the primary disadvantages of virtual games is that not everyone can buy them. It is excessively expensive, and those who cannot afford it will be excluded from utilizing it.
* **For a group of individuals, communication should not be substituted:** One of the primary disadvantages of virtual games is that not everyone can buy them. It is excessively expensive, and those who cannot afford it will be excluded from utilizing it.
* **Feeling of Worthlessness:** Virtual reality users frequently experience feelings of worthlessness. They have the impression that they are fleeing from reality, which may be quite harmful for them.
* **Users addict to the virtual world:** Users become hooked to the virtual world and struggle to navigate the non-virtual world. They may suffer from a variety of health problems as a result of their addiction.
* **Technology is still experimental:** Virtual reality technology is being employed in a variety of sectors, although it is still in its early stages. It hasn't been properly recognized or developed. The VR has a number of drawbacks that prevent it from being fully accepted.
* **Training in VR environment is not real:** Another disadvantage of virtual reality is that a person who has been taught in a VR environment may do well there, but not in the real world. As a result, in real-life settings, it will not provide the same effects as in the Virtual Reality environment.

**What is the goal of Virtual Reality?**

Because the scope of virtual reality is so broad, it's more realistic to state that creators are pursuing several objectives. The design team may have any or all of these aims, depending on the nature of the VR project. The most typically desired outcomes of VR development are listed below.

* **Immersion:** Wearing a VR headset allows you to immerse yourself in a virtual environment that is even more immersive than viewing a movie or playing a game with surround sound. They want the simulation to perfectly materialize their vision of becoming a superhero or defeating a dragon in their imaginations. VR developers are well aware of this and work hard to ensure that every component of the experience is as realistic as possible. While some of this may include making things more realistic, the true magic lies in making the simulation credible.
* **Comfort:** A person's immersion will be disrupted if they get uncomfortable, regardless of how intense the technological components of a VR presentation are. One of the most difficult aspects of virtual reality is the impact of headgear and other equipment on the body during extended sessions. When used for an extended period of time, ill-fitting headsets can cause rashes and other skin issues. As a result of the angry early adopters who published their horror stories online, newer VR headsets are taking comfort into account more. For certain people, motion controls and motion sickness are also a problem. You may expect further quality-of-life enhancements as technology advances, with a focus on comfort first and foremost.
* **New Gameplay Experiences:** Gamers and virtual reality go together like peanut butter and chocolate. Both disciplines already have a lot of overlap in terms of interest. As a result, there are a slew of VR-only games on the market, as well as older titles with VR features added after release. When done correctly, virtual reality can add a lot of enjoyable components to games that would be impossible to do with regular button controls. Many genres, such as first-person shooters, benefit from the increased immersion since they already attempt to put you in the shoes of the protagonist.
* **Education and Learning:** Virtual reality technology is also bringing up a slew of educational options. Students can go to digital recreations of historic sites and events and even walk about them. Children might explore these locations and study at their own speed instead of merely watching movies about Ancient Egypt. Gaming may be included into various instructional activities, but it is not essential to make them more interesting for students.
* **Specialized Job Training:** Many vocations need a high level of precision and accuracy. Because of the delicate nature of the task, occupations such as surgeon are tough to train for. Virtual reality may be used to teach people for these tasks without endangering anyone's life. As virtual reality becomes more widely available, it has the potential to significantly alter the work sector.
* **Healing and Confronting Trauma:** Confronting mental and emotional trauma is one of the most effective strategies to deal with it. Exposure therapy has been used by doctors to help patients overcome their phobias and even lessen PTSD symptoms. The patient can work through their concerns by investigating them completely by replicating the cause of trauma in a secure virtual world. This demonstrates the breadth of virtual reality's application beyond gaming and entertainment.
* **Develop Something Completely new:** Virtual Reality, as we currently understand it, is still very fresh and intriguing. Every day, fresh developers come up with brilliant concepts. It's impossible to predict how VR will be utilized in the next decade. This section is devoted to all the brand-new notions being dreamed up as you read this as a homage to this possibility.

**Conclusion**

Virtual reality is the development of a virtual world that is presented to our senses in such a way that we feel as if we are physically present in it. It achieves this purpose using a variety of technologies and is a technically challenging effort that must take into consideration human vision and cognition. It may be used for both fun and serious purposes. Technology is getting less expensive and more widely available. Because of the potential of virtual reality, we may expect to see many more new uses for the technology in the future, and even a fundamental change in how we interact and work.

Although virtual reality gadgets have improved with time, it still has a long way to go before it ceases to be science fiction and becomes a part of everyday life. It is anticipated that 2.5 million virtual and augmented reality gadgets would be marketed in 2016. According to a CCS estimate, 24 million VR devices are predicted to be shipped by 2018. This amount is minimal when compared to the total number of smart phone users. However, given how new this technology is to mainstream shopping, the rate of expansion is amazing.

There is currently very little VR content contributed by users. VR content may be created by companies with big resources. Users will eventually produce their own content.

***Case Study***

**Building the Vodafone VR for employees to practice presentations skills**

**Result Highlights:**

* In just four weeks, we created a customized virtual environment that was ready for deployment.
* At Vodafone, 91 percent of students want to see more VR training.
* Employees would refer Virtual Speech to a colleague 93% of the time.

**The Goals**

**Recreate the Vodafone Pavilion in virtual reality to improve staff presenting abilities and confidence.**

Vodafone is a global leader in mobile, broadband, and television technology communications. The team at Virtual Speech's main objective was to recreate the Vodafone UK Pavilion in virtual reality (VR) so that employees may practice public speaking abilities in a secure environment before giving a speech in real life.

They may practice in a variety of virtual surroundings, upload their own presentation slides and notes, receive immediate automatic feedback, and track their progress within the app using VR. Managers may also keep track of learner completion and development, making ROI easier to calculate.

The Pavilion is a huge conference room with a complicated arrangement and seating for a large number of people that is frequently used for in-person training. The goal was to finish the virtual simulation in time to show it off during Vodafone Learning Week, and then utilize it as a tool for communications training for months following.

A secondary objective was to use current, off-the-shelf Virtual Speech training scenarios and features in conjunction with the Pavilion simulation to upskill employees and provide them with opportunities to practice public speaking in a variety of situations.

**Creating the Pavilion**

With Learning Week just around the corner, the VirtualSpeech team only had about 6 weeks to recreate the pavilion in virtual reality. The crew started to work developing the basic layout and texturing the area after visiting the site and capturing images of the venue.

After regularly informing Vodafone on the build's progress and incorporating input, Vodafone and VirtualSpeech were pleased with the final results, and the scene was rendered in its entirety. The virtual audience was then added to the scenario, and Vodafone branding was placed throughout the app. Vodafone staff were then able to use the software using their Oculus Go headsets.

**In – App Features**

Several aspects were added to the simulation, in addition to the audience, to strengthen the realism and efficacy of employees' practice, as well as to give them with important feedback to evaluate their performance. The following are some of these characteristics:

* **Speech Analytics:** Artificial intelligence-powered voice feedback on parameters including tempo, loudness, tone, usage of hesitation words, and listenability.
* **Speech Insights:** Based on a variety of elements in the speech analysis, employees are given an assessment of how the audience perceives them.
* **Eye Contact Feedbacks:** Learners are given feedback on their eye contact and encouraged to pay attention to areas of the room that they may be overlooking.
* **Add Presentation Slides:** For more realistic and effective preparation, students can contribute their own presentation slides to the programme.
* **Notes:** Employees may add notes to the app that scroll like an autocue, allowing them to be prompted while practicing.
* **Live Feedback:** Employees receive feedback while presenting in order to offer them the best chance of receiving a high rating. If they are speaking too quietly, for example, a message displays advising them to speak louder.
* **Custom Questions:** Upload audio-recorded questions that the audience can ask after the lecture.

**Using VR as Vodafone**

In terms of logistics, Vodafone is using many Oculus Go headsets for this endeavor, which are shared among staff as needed. The Oculus Go is great for this form of training because it doesn't require any extra wires or gear and is portable.

The first several months of use have been quite good, with each employee spending an **average of 36 minutes on the app**. The Pavilion room, as well as the VirtualSpeech conference and presentation rooms, occupied the majority of this period.

According to a quick user poll done within the app, **93% of employees would suggest VirtualSpeech to a coworker**. This is really encouraging for a new technology that will be utilized by a small number of people.

Another **91 percent of respondents said they'd want to see more VR training at Vodafone**, which is encouraging for the overall engagement and efficacy of VR learning experiences.

Vodafone UK was able to implement VR soft skills training throughout the organization in a disciplined and successful manner thanks to this initiative.

**Benefits of VR training Experience**

* Employees have the option of getting on-demand, realistic practise in the Vodafone Pavilion before giving a presentation in front of a live audience.
* Learners receive immediate feedback on their performance, which they may utilise to improve right away, and they can track their progress each time they practise.
* Additional VirtualSpeech VR situations, such as a meeting room, sales pitch, and press conference, are available for employees to practise a variety of different presenting and public speaking abilities.
* Employees can see their areas of strength and progress thanks to the app's performance metrics and feedback data, and managers and admins can see learner's areas of strength and improvement as well. This can assist both the student and the management identify any skill gaps that require more training.