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Virtual Reality

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***Abstract* —** This thesis is described about VR and functions. virtual reality (VR) is a amazing and interesting topic at the current time. This is not really new. It defines the advantage and disadvantage of VR and uses of VR in various field. Virtual Reality (VR) literally makes it possible to experience anything, anywhere, anytime. It is the immersive type of reality technology and can convince the human brain that it is somewhere it is really not. We discuss here about VR, uses, history, application, advantage , disadvantage of VR

***Keywords* —** VR, web3D, environment, 3D, application, imagine.

I. INTRODUCTION

Virtual Reality (VR), sometimes called Virtual Environments (VE) and also known as "artificial reality", "artificial worlds"', "virtual worlds", "virtualties", is a fully-theatrical, interesting, interactive experience of an alternate reality through the use of a computer simulator in which a viewer synthetic (i.e., simulated) environment by means of human-computer interface equipment and interacts with simulated objects in that environment as if they were real.

Virtual means "A figure in mind but not exist in actually".
it is same like as sleeping dream that create figures, houses and different role of different things in our mind we can be say that it is an imaginary world or imaginary environment, after wakeup this environment has lost then we can say that it is not present in physically. This is our mind creativity for short time.In 1959-60 the word virtual was used for computer in meaning of "Not exist physically but generated by software ".

Now think a question, how to present a virtual or imaginary environment to the others. so, "virtual reality" techniques represent imaginary things in form of eye view.

Fig. 1 Image creates through VR.

In 1982 "virtual reality" was first used by Damien Broderick in his novel of science context "The Judas Mandala".

Display the imaginary and realistic interaction ability of the viewer in the form of 3D in artificially projected environment by using computer technology simulated environment, it called "VR or Virtual Reality".

The role of VR is important in everyday life because it helps in meetings, personal communication, to monitor work, gaming and training etc.

Google Cardboard, Meta, Samsung Gear VR, Avegant Glyph, Epson Moravia is the few example of VR.
In Virtual Reality (VR) simulates the many senses as possible, such as vision, hearing, touch, even smell, the computer is transformed into a shapes to this artificial world.
"cyberspace" is a networked virtual reality.

II. SOME BASIC DEFINITIONS

- "Real-time interactive graphics with three-dimensional models, combined with a display technology that gives the user the immersion in the model world and direct manipulation." ------ *By Fuch*
- "The illusion of participation in a synthetic environment rather than external observation of such an environment. VR relies on a three-dimensional, stereoscopic head-tracker displays, hand/body tracking and binaural sound. VR is an immersive, multi-sensory experience." ----- *By Giga*
- "Computer simulations that use 3D graphics and devices such as the Data Glove to allow the user to interact with the simulation." ----- *By Jarg*

- "Virtual reality refers to immersive, interactive, multi-sensory, viewer-centered, three-dimensional computer-generated environments and the combination of technologies required building these environments." ----- *By Cruz*

III. HISTORY

Virtual reality comes as early as the 1860, Antonin Artaud took the view that illusion was not distinct from reality, advocating that spectators at a play should suspend disbelief and regard the drama on stage as reality.

The first think to the latest concept of virtual reality came from science fiction.
In 1950 Morton Heilig wrote an "Experience Theatre" that could add all the senses in an effective manner, thus that drawing the viewer into the onstage activity.
In 1962 he built a prototype of his vision dubbed the Sensorama, along with five short films to be displayed in it while engaging multiple senses (sight, sound, smell, and touch).

David Em became the first artist to produce navigable virtual worlds at NASA's Jet Propulsion Laboratory (JPL) between 1977 to 1984.

Atari founded a research lab for virtual reality in 1982, but the lab was closed after two years due to the Atari Shock. But Tom Zimmerman, Scott Fisher, Jaron Lanier, Michael Naimark, and Brenda Laurel kept their research and development on VR-related technologies.

In1980 the term "virtual reality" was popularized by Jaron Lanier, one of the modern pioneers of the field. Lanier had founded the company VPL Research in 1985. VPL Research has developed several VR devices like the Data Glove, the EyePhone, and the Audio Sphere.

In 1992, Louis Rosenberg created the Virtual Fixtures system at the U.S. Air Force's Armstrong Labs using a full upper-body enabling a physically realistic virtual reality in 3D. The system enabled the overlay of physically real 3D virtual objects registered with a user's direct view of the real world, producing the first true augmented reality experience enabling sight, sound, and touch.

In 2001, Z-A Production , Barco, and Clarté developed SAS Cube (SAS3) became the first PC based cubic room . It was installed in Laval, France. The SAS library gave birth to VirtoolsVRPack.

By 2007, Google introduced Street View, a service that shows indoor views of an increasing number of worldwide positions such as roads, indoor buildings and rural areas. It also features a stereoscopic 3D mode, introduced in 2010.

In 2014, Sony announced Project Morpheus, a virtual reality headset for the PlayStation video game console.

In 2015, HTC and Valve announced the virtual reality headset HTC Vive and controllers. The set included tracking technology called Lighthouse, which utilized wall-mounted "base stations" for positional tracking using infrared light.
In 2016, HTC shipped its first units of the HTC ViveSteamVR headset. This marked the first major sensor-based tracking, allowing for free movement of users within a defined space.

IV. TECHNOLOGY

The Virtual Reality Modelling Language (VRML) is the first tool that used for develop the "virtual worlds" without use of headsets in 1994.

In 1997, the web3D consortium developed the industry standards for web-based 3D graphics. later, consortium developed open-source standard for web-based distribution of VR content name as X3D.

All modern smart phones displays are based on VR technology.
it sense gyroscopes and motion sensors for tracking head, hand, and body positions, small HD screens for stereoscopic displays, and small, lightweight and fast processors.

V. APPLICATIONS OF VR

- VR is most commonly used in entertainment applications such as gaming and 3D cinema.
- In robotics, virtual reality has been used to control robots in telepresence and telerobotic systems. The technology is useful in robotics development such as in experiments the how robots work an intuitive human interface.
- In social sciences, virtual reality offers a cost-effective tool to study and replicate interactions in a controlled environment. It can be used as a form of therapeutic intervention.
- VR is used to view the plan of a building. This gives a 3 dimensional image. upload all the virtual versions of the proposed buildings on their virtual reality building and their all clients can view the basic structures from there.
- VR has been improving teaching and learning. With virtual reality, Instead of going to analyse certain industrial processes, it can be simulated on virtual reality environment. This enhances understanding and also makes learning fun for students.
- Virtual reality has also been adopted in business. It is now being used for virtual tours of a business

environment, training of new employees and this also gives all view point of product.

VI. VIRTUAL REALITY IN USE

- Google Maps shows Street View via virtual reality. And Google Business View people inside of restaurants, departments, stores etc.
- In a clinical trial a virtual reality tour of the operating room prior to anaesthesia helped reduce preoperative anxiety in children scheduled to undergo surgery.
- There are VR systems which enable wheelchair users to navigate a virtual world, for example how to learn to move around and avoid obstacles in a virtual setting before putting these into practice in the real world.
- Use of virtual reality, have contributed enormously to improving the treatment, training, and quality of life of children with disabilities.
- The VR industry mainly provided VR devices for medical, flight simulation, automobile industry design, and military training purposes.
- The University of Georgia and the Georgia Institute of Technology developed a program called "BreakThru" to help students with disabilities pursue STEM (Science, Technology, Engineering, and Math) careers.
- Virtual Reality is being found to be useful in testing the design of buildings for disabled access before they are built.
- Virtual reality's growing market presents an opportunity and an alternative channel for digital marketing. The International Data Corporation expects spending to increase for augmented and virtual reality.
- It can be used in military training for the soldiers to get familiar with different areas in the battlefield.

VII. ADVANTAGES OF VIRTUAL REALITY

- Virtual reality creates a realistic world.
- It enables user to find viewer places.
- Through Virtual Reality user can experiment with an artificial environment.
- Virtual Reality make the education more easily and comfortable.
- Virtual Reality has makes watching more enjoyable than reading. VR technicality is extremely interesting and engaging. VR technology creates enjoyable experiences. This technology motivates the students to learn and know better in life.

VIII. DISADVANTAGES OF VIRTUAL REALITY

- The equipments used in virtual reality are very expensive.
- It consists of huge and complex technology.
- We can't move from virtual reality environment to our own the real world.
- In the classroom you can act with flexibility. You are open to give suggestions and ask questions. This is not possible with virtual reality. With the virtual reality headset, you can make use of the same program in all the sessions. There is no scope for positive interaction.

IX. CONCLUSIONS

Virtual reality is truly inspiring and emerging the 3D educational skill.

The development and use of VR is profitable and learnable with the help of Virtual Reality becomes efficient when users can both understand and learn. This is true in the virtual as well as in the real world.

The big advantages of VR are the substitution to real life, 3D perception, and the wide availability to markets.

The functions to most benefit from virtual reality are training, design, marketing, retailing, and real estate etc.

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