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Augmented Reality and Virtual Reality on Web: Be Ready For Second Life

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Abstract – *"The constant evolution of the technology is a pervasive force, it impacts the way that business is conducted, communication is relayed, healthcare is negotiated and knowledge is acquired." Make no mistake, the next couple of years are going to see huge developments for the technology industry and bring about a seismic shift in the way that we do business and education on the web. The catalyst for this change is going to be AR and VR which will completely blow current technologies out of the water. As the internet has completely change the perspectives of business, communication and more; augmented and virtual reality alter the way we engage in all kinds of activities on the web.*

AR and VR are the key to experiences, feelings, touching and interactions fueled by the desire to become immersed in a simulated land for education, entertainment and play or to add a new dimension of interaction to experience things that are not accessible in real life or even not yet created in fact are often combined together to generate an even more immersing experience. Augmented reality adds information and meaning to a real object or place. Dissimilar to virtual reality, augmented reality does not create a simulated reality. Instead, it takes a real object or space and uses technologies to add contextual data to deepen understanding of it. So, this paper brushes the importance of this stimulated reality stating how VR has gone through advancements giving us a cutting edge technology. As people riveting on VR mainly for entertainment but their real impacts are in arts, business, communication, design, education, engineering, medicine, path planning and many other fields.

Key Words*: *Augmented Reality (AR), Immersive System, Virtual Reality (VR), Virtual Worlds

1. INTRODUCTION

The former times of computers is one of increasing intimacy. In 1990s, augmented reality and virtual reality was on the lips of everyone as multiple companies tried and failed to make it happen. As technology is improving at a rapid pace, as many things are possible today that were not possible ten years ago even if we tried our best to make it happen. Today, some of the impossible things are rising to the occasion in the form of augmented reality and virtual reality.

We are living in the world through our senses and perception systems. In school we all learned that we have five senses: hearing, sight, smell, taste and touch. These are however only our most obvious sense organs. The truth is that humans have many more senses than this, such as a sense of balance. The other sensory inputs, plus some special processing of sensory information by our brains ensures that we have a rich flow of information from the environment to our minds. [1]

Every single thing that we know about our reality comes by way of what we perceive by our senses. Generally our entire experience of reality is simply a combination of sensory information collected from sensory receptors and our brains sense-making mechanisms for that information. It stands to reason then, that if you can present your senses with made up information, your perception of reality would also change in response to it. You would be presented with a version of reality that isn't really there, but from your perspective it would be perceived as real.

2. AUGMENTED REALITY

Augmented reality is a growing phenomenon and very neat concept. In this we take a view of the world around us and supplement it with images, text, sound, video and it turns the environment around you into a digital interface by placing virtual objects in the real world, in real-time. AR can be seen through a wide variety of experiences. Following are the three categories of augmented reality tools.

1. Augmented Reality 3D viewers allow users to place life size 3D models in your environment with or without the use of trackers. Trackers are images that 3D models can be attached to in AR.
2. Augmented Reality browsers enrich your camera display with contextual information. For example, you can point your smartphone at a building to display its history or estimated value.
3. AR is generally experienced through gaming, creating immersive gaming experiences that utilize your actual surroundings. Imagine shooting games with zombies walking in your own bedroom. The biggest use of augmented reality gaming to-date is Pokemon Go which entranced the users in 2016 as well as allowing users to catch virtual Pokemon who are hidden throughout a map of the real world.

AR technology mainly works with the help of the sensors and is also a stretched virtual reality technology as AR is a close cousin to virtual reality. The users will be able to experience a real environment while using this technology, for e.g. if we are watching a live telecast of a game, AR will give us the same ambiance of sitting inside that stadium. [2][3]

3. VIRTUAL REALITY

Virtual Reality is a real time and interactive technology means the computer is able to detect user inputs and alter the virtual world instantaneously. Virtual interactivity and its captivating power contribute to the feeling of being the part of the action on the environment that the user experience.

On the other side of coin, Virtual worlds combine the power of 3D graphics and the internet, giving users the ability to create new versions of themselves literally within a virtual world. VR has been defined as "...a realistic and immersive simulation of a three-dimensional environment, created using interactive software and hardware and experienced or controlled by movement of the body" besides VR is an artificial, computer-generated simulation or recreation of a real life environment or situation. It immerses the user by making them feel like they are experiencing the simulated reality firsthand, primarily by stimulating their vision and hearing.

Creating Virtual World: With this busy world and stresses of everyday life in actual reality, why would individuals want to create another reality, in the virtual world? Or is leaving the actual world an escape from reality? Do people enter into this virtual world to get away from the daily influences that effect our behavior and mood? Reasons for creating a virtual life are endless and vary from person to person, but from what I have found there are three main reasons individuals enters a virtual reality. [1][3]

1. We all love to play the games. Whether it's a card game or a computer game, we love games; it often brings out the child inside from all of us. Games are an outlet to create something or do something we cannot do in actual reality. Whether it is being a murderer in the game of clue or maneuvering a Warthog in Halo to find the opponent, we enjoy games. Games allow us to become something without the natural consequences of reality.

2. Living in a world on your computer protects people, you and others. It protects others from your facial expressions that often times express more emotion than your words. It protects you from being rejected or teased. Living a life on your own computer screen protects peoples' emotional stability. Living a life on your private computer saves the embarrassment of sweaty hands or shifty eyes.

3. Comparing, we all do it. There are things we may not particularly like about ourselves in normal life. Perhaps some of us are not as tall as we would like to be or not as athletic or creative. But having a second life in the virtual world can change that completely.

Fig: Interaction with Virtual Reality Headset

4. EFFECT OF AUGMENTED REALITY AND VIRTUAL REALITY ON E-COMMERCE

In a world where brands struggle to keep themselves different from the rest, augmented and virtual reality was born to serve the brands just what they needed. There are many websites that give real time experience of augmented and virtual reality to the customers. Bridging the gap between the virtual and physical worlds, Augment reality changes the way we see, imagine and learn about the world around us. Augmented reality is the evolution of online product visualization. It connects online and offline channels creating a seamless Omni channel retail experience to drive engagement and sales.

Online and in-store customers want to interact with a product to get a feel of how it works before heading to the checkout. Augmented reality uses animations to allow shoppers to see how complex products like appliances or electronics work and function. Before making a purchasing decision, customers often want to see various color selections and explore other modifications that might be available. Historically, customization options have been difficult for online retailers to convey to their customers. Augmented reality and computer graphics make it easy for customers to explore their options and make personalized modifications while shopping online. With retailers who offer augmented reality, customers can change the color of

furniture they're looking to buy to see how it looks in their home.

It isn't rare for a customer to start shopping in one channel and end up purchasing through another. A true Omni channel retail approach is about creating a customer experience that is seamless across all mediums. Augmented reality is helping to solve these dilemmas with product visualization. AR makes it possible to see virtual products in your actual environment, and the integration of AR in ecommerce is quickly changing how consumers shop by allowing them to see what they want to buy before any purchase is made. [2][5]

Even with the knowledge of a product's dimensions, it's still challenging to envision how it will look in your home or on your counter beyond a simple eyeball test. Augmented reality is set to revamp the online shopping experience in that sense. What if customers could see the product in front of them right now? AR is providing value to retailers and customers in the following areas:

1. Keeping customers engaged throughout the buyer's journey is a priority for all retailers, but it's still a difficult task. Engaging users through augmented reality leads to longer times spent browsing an online store, interacting with products and testing additional functionality through AR. Additionally, AR provides true value when it comes to making a purchase decision.

2. While shopping online, customers have to imagine and interpret what an item would feel like in their hands or look like in their home. AR technology helps overcome this online buyer's challenge by transforming imagination into a reality.

5. APPLICATION OF AUGMENTED REALITY

1. Automobile engineering
2. Information technology
3. Medical instruments
4. Projectors
5. Virtual retina displays
6. Location tracking and mapping
7. Sports telecasting
8. Video gaming consoles and mobile gaming
9. Virtual keyboard

6. APPLICATION OF VIRTUAL REALITY

1. Architecture
2. Sport
3. Medicine
4. Arts
5. Entertainment

7. FUTURE WORK

In the forthcoming years, as more research is done we are bound to see both augmented and virtual reality become as foundation in our homes and at work. As the computers become faster, they will be able to create more realistic graphic images to simulate reality better. It will be interesting to see how it enhances artificial reality in the years to come. Besides augmented and virtual reality have the potential to become the next big computing platform.

The technology is becoming cheaper and more widespread. We can expect to see many more innovative uses for the technology in the future and also it is possible that in the future we will be communicating with virtual phones. The future is augmented as well as virtual reality, and its benefits will remain immeasurable.

8. CONCLUSION

Augmented and virtual reality have the potential to improve productivity in real world tasks. Ultimate goal of virtual reality is the creation of a virtual environment presented to our senses in such a way that we experience it as if we were really there. It uses a host of technologies to achieve this goal and is a technically complex feat that has to account for our perception and cognition.

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