

EMERGING VIRTUAL AND AUGMENTED REALITY ENVIRONMENTS IN E-COMMERCE

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ABSTRACT

Today we are living in the era of convergence and technological developments, where Machines are imparted deep learning through Artificial Intelligence(AI), internet is adopting scalable, huge storage, cost effective and fast processing cloud service environments . Many technologies are being integrated with each other to give birth to new technological environment. Virtual Reality (VR) and Augmented reality(AR) environments are emerging because of human desire to escape the boundaries of the real world by embracing cyberspace. When humans can interact with virtual environment in more natural manner, then it will generate new form of Human-machine interaction

(HMI).This paper will explain the concept of Virtual Reality and how these VR environments are beneficial when implemented in e-Commerce and to have immersive experience of the product which customer want to buy from online retails shops.

Keywords: Artificial Intelligence (AI), Cloud-Service, Cyberspace, Environments, Virtual Reality (VR).

I. INTRODUCTION

Global society is getting benefited by technological developments, integration and emergence of various technologies. Computers and computing devices are making our day to day life easier. Technologies so developed are user friendly and beneficial for the society as a whole. Recently there is emergence of a new technology called Virtual Reality, **Virtual reality (VR)** typically refers to computer technologies that use software to generate the realistic images, sounds and other sensations that replicate a real environment (or create an imaginary setting), and simulate a user's physical presence in this environment. 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 or as an "immersive, interactive experience generated by a computer. There are wide range of areas like entertainment and gaming where impact of VR was first recognized and praised and then VR environments has been implemented in other areas which in turn led to new and exciting discoveries in these areas like education and research, medicine, Armed forces, flight simulations, business promotion, e-commerce, Architecture , sports, arts etc. VR environments has been

adopted and implemented by various organizations of different work area because VR environments are practical inexpensive and danger free for example from trainee fighter pilots to medical applications trainee surgeons, virtual reality allow to take virtual risks in order to gain real world experience. As the cost of virtual reality goes down and it becomes more mainstream you can expect more serious uses, such as education or productivity applications, to come to the fore. Virtual reality and augmented reality could substantively change the way we interface with our digital technologies. VR environments now emerging as the technology of masses because of its lowering cost, dynamic user interface, immersive experience and personalization of their real and virtual environments like in VR mirrors, head gears , and cardboards users and e-Commerce tycoons in the field of fashion , architecture, automobiles have created their VR website tour and virtual product display, to give their customers an immersive experience, VR and AR are becoming the next step in an e-Commerce. Therefore, in this contest, the present paper highlights advantages, benefits, and some ethical issues of Virtual and Augmented Reality Environments being implemented in online retail or in ecommerce.

II. VIRTUAL REALITY

The **definition of virtual reality** comes, naturally, from the definitions for both ‘virtual’ and ‘reality’. The definition of ‘virtual’ is near and reality is what we experience as human beings. So the term ‘virtual reality’ basically means ‘near-reality’. This could, of course, mean anything but it usually refers to a specific type of reality emulation. We know the world through our senses and perception systems. In school we all learned that we have five senses: taste, touch, smell, sight and hearing. 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 for example. These 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. Everything that we know about our reality comes by way of our senses. In other words, our entire experience of reality is simply a combination of sensory information 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. Something we would refer to as a *virtual reality*. So, in summary, virtual reality entails presenting our senses with a computer generated virtual environment that we can explore in some fashion.

2.1 Virtual Reality in technical terms

Virtual Reality in technical terms is used to describe a three-dimensional, computer generated environment which can be explored and interacted with by a person. That person becomes part of this virtual world or is immersed within this environment and whilst there, is able to manipulate objects or perform a series of actions.

III. VIRTUAL REALITY CONCEPTS

The concepts behind virtual reality are based upon theories about a long held human desire to escape the boundaries of the ‘real world’ by embracing cyberspace. Once there we can interact with this virtual environment in a more naturalistic manner which will generate new forms of human-machine interaction (HMI).

3.1 keyboard and mouse not required

The aim is to move beyond standard forms of interaction such as the keyboard and mouse which most people work with on a daily basis. This is seen as an unnatural way of working which forces people to adapt to the demands of the technology rather than the other way around. But a virtual environment does the opposite. It allows someone to fully immerse themselves in a highly visual world which they explore by means of their senses. This natural form of interaction within this world often results in new forms of communication and understanding.

3.2 Three Dimensional virtual environment

The experience of a virtual world mimics that of a real world scenario but often without many of its constraints. Virtual reality enables allows someone to do the following:

- Walk around a three-dimensional building
- Perform a virtual operation
- Play a multi-user game
- Take part in a theatre of war
- Interact with an artwork, e.g. installation

Plus the fact that they can do this in a 3D environment means that they replicate an experience similar to that in the real world but without many of the dangers. This is preferable to trying to simulate these experiences in a two-dimensional setting, e.g. a computer desktop. Find out more about these and other applications in the how virtual reality is used article.

3.3 Problem solving with virtual reality

Virtual reality also acts as a problem solving **device** in that it enables us to explore various options as a means of finding an answer to a problem. For example, an engineering company will use virtual reality to **produce a prototype** which is then tested and the results fed back to the design team. The advantage of this is that it enables the designers to make alterations to their design but at far less time and cost. This is a preferred option to building a physical prototype which is expensive to build and make changes to: especially if it undergoes several alterations as part of the design process.

IV. VR ENVIRONMENT APPLICATIONS

There are numerous ways virtual reality can be used which provide enormous benefits to us. These include:

Healthcare/surgery

- Military
- Architecture

- Art
- Entertainment
- Education
- Business
- The media
- Sport
- Rehabilitation/treatment of phobias

The list of applications for VR is endless. Virtual reality may have been considered an overnight sensation but it has been re-invented under the term ‘virtual environments’ and is proving to be useful in ways which had never been previously considered. Games, surgery and flight simulators are the most well known uses of virtual reality but other, lesser well known applications include:

- Visualisations, e.g. geographical
- Study and treatment of addictions
- Weather forecasting
- Historical, e.g. re-creating ancient civilisations
- Data analysis, e.g. financial data

There may be additional applications which we have not heard about.

V. VIRTUAL REALITY ETHICAL ISSUES AND MEASURE OF EFFECTIVENESS OF VIRTUAL REALITY SYSTEMS

There are a few ethical issues in regard to virtual environments which need to be addressed. These are related to human behaviour and motivations and are also a concern for the gaming industry.

They include:

- The problem of ‘desensitisation’
- Virtual criminality

5.1 The desensitisation of virtual reality

Concerns have been raised about a possible relationship between virtual reality and desensitisation. This refers to virtual reality games in which there are high levels of violence or training exercises for the military in which soldiers engage in simulated combat scenarios which include killing. Desensitisation means that the person is no longer affected by extreme acts of behaviour such as violence and fails to show empathy or compassion as a result. In some situations they actively seek out this type of scenario for the adrenaline rush and sense of power. This has been noticed with gamers, especially those who play first person shooters or role playing games which involve a high degree of immersion. Another issue related to this is ‘cyber-addiction’. There are people who

become addicted to virtual reality games and as a consequence, start to blur the boundary between real and virtual life. They spend increasing amounts of time in the virtual environment which has a detrimental effect on their real world life.

5.2 Virtual criminality

It is hard to imagine but what happens if someone commits a criminal act but within a virtual environment? A potential situation is one in which several people are immersed within a virtual environment but one of these participants becomes injured or traumatised due to the actions of another person in that situation. The question is whether it is possible for someone to suffer an injury or mental distress as a result of a violent action carried out in a virtual environment. And if this does happen is the perpetrator punished in a similar way to someone who commits this action in the real world? What may be argued is whether a virtual reality participant can experience pain, distress or other emotions associated with a criminal act? This is an ongoing issue. The disadvantages of virtual reality described above are minute in comparison to the wide benefits of virtual reality as a whole but it is very important that these issues are addressed.

5.3 How to measure effective virtual reality systems

Does virtual reality do this? Does it fit into the category of ‘ease of use’ and how do we measure its effectiveness? The problem is that existing usability guidelines are designed for standard user interfaces such as a desktop computer in which the user interacts with information in a two dimensional space. But virtual reality is a 3D system which enables users to interact with objects with a computer generated environment, often utilising their senses as well. The aim is to generate an experience which is indistinguishable from the real world. The issue is that of developing usability guidelines for virtual reality systems which ensure that they are easy to use, effective and efficient. Virtual reality has its own particular issues which require a different approach to that used for other interactive systems.

VI. VR AND AR ENVIRONMENTS IN E-COMMERCE

We are aware, but as retailers look to give their customers an immersive experience, VR and AR are becoming the next step in an increasingly digital world.

6.1 VR environment in fashion Industry

From virtual and augmented experiences that bring budding fashionistas to the FROW (Catwalk Front Row), to in-store virtual journeys, VR and AR are giving customers the opportunity to view products from all angles, enhancing the presentation and bringing real-life experiences to e-commerce.

6.2 e- Commerce through VR Gadgets

With Oculus, Samsung, Sony and Google all vying for positions in the market, VR is rapidly growing. Samsung’s Gear VR headset goes on sale shortly and Oculus Rift and Sony Playstation VR are due to launch in 2016. And not forgetting the Google Cardboard, currently available, it provides an inexpensive way to turn your smart-phone into a VR headset. Earlier this year, Rebecca Minkoff and River Island teamed up with Google Cardboard as a way to exhibit their wares and new collections. Having filmed the Rebecca Minkoff Fall 15 runway show, users were able to download the show on to their smart-phone and from a simple head movement you could be given a sweeping view of the entire show, from the runway, to the photographers, or to audience members. Not to mention, the Cardboard was given a high fashion makeover. To celebrate the launch of their Design Forum x Jean-Pierre Braganza collection, River Island created an augmented reality experience where you were able to take control of a Kingfisher and manoeuvre it through a mechanical structure to a model wearing the collection.

6.3 VR in Homeware and interior design

Not just for the fashion world, VR and AR are taking hold in other spaces including homewares and interior design. For their 2014 catalogue Ikea created an augmented reality feature on their app that allowed customers to view and place 3D virtual products in their own homes. Giving customers the chance to have preview how their home could look, eliminating the guesswork and adding certainty that products are suited for their space. Another company M&S substituted the traditional showroom in favour of a VR experience. Using Oculus Rift and Leap Motion technology, avatar guide “Amy” advised customers through placing their choice of three different ranges in either a townhouse or a loft style apartment. And at the end consumers were encouraged to share their installations via social media. With so many variations in room layout and furniture choices it can be hard to visualise the functionality and different combinations available but VR and AR offer an excellent solution to help with customising our interior spaces of their homes/ apartments.

6.4 Augmented Reality mirrors

Augmented Reality mirrors allows user to try on different outfits. Microsoft and AR specialists Ads Reality to create an interactive video wall and an AR window giving customers the opportunity to stand alongside Halo characters, And in addition customers using the GAME app are able to scan in-store floor markers to take a selfie with the characters in the middle of the aisles. With Black Friday being one of the biggest shopping days of the year, and UK consumers having spent £180m online alone last year, it seems only logical to incorporate new technology into that shopping experience. House of Fraser utilised the use of augmented reality in stores with shoppable windows, giving users the opportunity to scan a vinyl shape within the windows to be able to view the in store’s Black Friday Deals. Designer lifestyle brand Tommy Hilfiger has added a virtual reality fixture to their New York flagship on Fifth Avenue, which gives shoppers a front-row view of the Fall fashion show through a Samsung GearVR headset. And they’re soon to be installed in the brand’s flagship stores throughout the US and Europe, bringing customers entertainment and the chance to view the current season’s runway collection.

6.5 Virtual Tours of e-Stores

One company bringing bricks-and-mortar to life with VR are Avenue Imperial. Founded in 2013, they are one company allowing iconic brands to implement virtual tours of their stores. Featuring brands such as Harvey Nichols, Karen Millen and Jimmy Choo, Avenue Imperial allow customers to see these brands' store conceptions from the comfort of their own home as well as presenting the opportunity to shop the store at the same time. With many retailers and e-commerce stores beginning to adopt this technology, they are bridging the gap between physical and virtual and creating a deeper sensory experience. This is changing, and within a couple of years we'll know if VR is the future for retail. So for now retailers are exploring how they can best use this technology. The early adopters and pioneers may not be able to directly attribute significant revenue yet but they certainly demonstrate a readiness to embrace this immersive technology, which suggests a future where VR and AR play a significant role in

VII. CONCLUSION

Virtual reality is the development and rendering of a virtual environment presented to our senses in such a way that we experience it as if we were really there. It uses an integration of technologies to achieve this goal and is a technically complex feat that has to account for our perception and cognition. It has both entertainment and serious uses. The technology is becoming cheaper and more widespread. It is expected to see many more innovative uses. There has been an increased interest in virtual reality which has led to new developments for society as a whole. This technology is recognized as an adaptive and feasible rather than something which only relates to sci-fi movies and games only. Virtual reality has a wide range of applications which range from gaming and entertainment through to medicine, engineering, military training, scientific visualization and business. VR can be viewed as a form of human-computer interaction (HCI) in which information flows between the user (person) and the technology. But the aim with HCI is to enable people or users to use the technology to achieve a goal easily and effectively. Technological developments and human desire led to go beyond the reality to embrace virtual environments. There is no doubt VR and AR are being implemented by many of the e-commerce companies whose creativity is delivering immersive retail experiences now online retailers are exploring how they can best use this technology by using head gears, cardboard, VR mirrors, and virtual tours and virtual trial rooms in Apparel online retailers. Etc. on their e-commerce website (ebay.com.au/VR and MYER) and The early adopters and pioneers may not be able to directly attribute significant revenue yet but they certainly demonstrate a readiness to embrace this immersive technology, which suggests a future where VR and AR play a significant role in e-commerce. At last we can say that VR and AR are emerging technological environments that have everything that e-commerce wants to make it real on virtual cyber space, to promote e-commerce and give customers immersive and real life experience of products that they want to buy from online retail shop or e-commerce websites.

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