

Virtual Reality is a simulation and immersion technology that creates a realistic three-dimensional image or artificial environment with a mixture of interactive hardware and software, and presented to the user in such a way that it is accepted as a real environment in which it is interacted as if it is real. Until recently, virtual reality had been something of a fantasy for storytellers and technologists. There have been many decades of experimentation around virtual reality, from the first head-mounted VR system in the late 1960s to the first commercial products in the 1980s to the first Hollywood film in 1992, *The Lawnmower Man*, which shaped general population's perceptions of virtual reality, in short VR. The current age of virtual reality began in 2010. Virtual reality technologies are drawing millions of dollars in investments, and they are heading to reach \$150 billion by 2020. It is hard to tell where virtual reality belongs and it could become ubiquitous in all workplaces. The widespread adoption of Virtual Reality technologies are set to transform entertainment, healthcare, tourism, sports, and education and manufacturing industries dramatically in the coming years.

Benefits of Virtual Reality

Virtual Reality brings so many benefits in our day-to-day life without even anyone realizing it. Its impacts have been growing so fast that no one ever dreamed before. Let us recognize some of the key benefits that Virtual Reality brings. There are situations where staffs are to be trained where real risks of personal injury or loss/damage to expensive equipments such as airline pilot training, battlefield rehearsals. Virtual Reality technology enables to simulate such situation in a less expensive and safe environment. The VR technology provide a virtual environment that makes users feel hearing the real sounds and seeing the real things as if users are in the real locations. It is a life gifts to by the disabled people who can taste the same experience as others do. Virtual reality is enables effective communication. It makes Interactive learning at schools more fun, interesting and enjoyable, simulation games enables users to communicate with the people that they ever met in their real life and makes the relationship more efficient compared to the real life. 3D movies like *Avatar*, *Robocop* bring science fiction to entertainment reality and gives audience a more real and to allow individual to experience adventures under extreme conditions. The role of VR in health industry is limitless. Simulation of complex procedures on human bodies helps medical professionals to learn and practice more before can be applied in real world. In real-estate industry, the whole project can be simulated in 3d with fine details and make adjustment before the actual work starts. The list goes on and on.

Few things wholly evil or wholly good

Abraham Lincoln once quoted that “There are few things wholly evil or wholly good. Almost everything...is an inseparable compound of the two, so that our best judgment of the preponderance between them is continually demanded”.

Ethics & Integrity in Virtual Reality

A good professional always follows the codes of ethics relevant to his/her profession laid by the respective authority such as Human Resources department in a company. He/She should be responsible and accountable to change the code of ethics if codes of ethics are in sync or out of date with larger ethical principles that generally acceptable outside of the profession. One should follow civil laws, regulations such as safety requirements. Also one should not get along or co-operate with others who are not following codes of ethics and he/she should bring those incidents to the ethics governing body. Integrity is the characteristics of resisting to pressure or to compromise to ethical standards whether pressure comes from customers, employers, clients or anywhere else. One inherits the organization values and code of conducts upon employment. Having personal integrity involves being clear about your own values, and having professional integrity means engaging with the values of your profession. Having integrity means one should ‘stand for something’, trying to change practices and attitudes that one think are less than ethical. For some, having integrity involves trying to influence for the better the practices of your employer, your profession, or even society at large. One should honor his/her commitments and put company or clients interest above his/her own interests. One should not lie or cheat and committed to the work agreed to the immediate supervisor, customer, client or patient.

In this article, let us primarily focus and identify the interesting facts of Virtual Reality, and outline some possible answers from three perspectives; Virtual Criminology, Effects on the body and mind and Sensory Deprivation.

Virtual Criminology

Humans are fundamentally social. The virtual crimes is on the rise due to desensitization in which one is no longer affected by extreme acts of behavior such as violence and fails to show empathy or compassion. Another ethical issue related to Virtual Reality is cyber-addiction where the boundary between real and virtual starts to blur. One spending more time in the virtual environment has a detrimental effect on real world life. A potential situation is one in which several people are immersed within a virtual environment but one of these participants becomes injured due to the actions of another person. It is also possible for someone to suffer an injury or mental distress as a result of a violent action carried out in a virtual environment. Simulation games such as battlefield exercises where mass killings taking place, terror groups’ ideology propaganda games are examples wherein people get drawn into and subsequently carry out assaults and crimes in real world. Though virtual reality brings more benefits as a whole but it is very important to address virtual crimes. Perpetrator ought to be punished in a similar way to someone who commits the action in the real world. For an example, a death threat via virtual reality technology is legally the same as a death threat via an oral conversation, an e-mail or a letter. Sexual harassment is another dimension to virtual reality and it has been a feature from the early days of the internet. The abuse has been limited largely to verbal and visual messages until now, but as virtual reality



technology becomes more immersive, the line between our real bodies and our digital bodies begins to diminish. Violent crimes and sexual harassment acts are censored by censor board before releasing the content to public consumption. Terrorists and porn sites are blocked and accessing them considered as offense. In virtual technology platforms, the same content released unblocked, uncensored and unedited.

Similar to common carrier laws, it is necessary to come up with socially responsible regulations to streamline immense technology content as well.

Effects on the body and mind

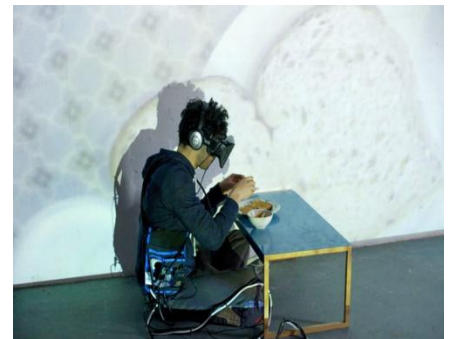
In 3rd quarter of 2017 alone more than a millions of Virtual Reality headset/gadgets shipped. Virtual Reality headset is a natural evolution from book reading to TV and to movies to iPod/iPad which is all a type immersion technology in a way. VR headset has taken immersion technology to a new high and their effect on body and mind are mind boggling. While wearing the product's headset one becomes blind to the real world. One can trip and hit head and get seriously hurt. Headsets and gadgets affect the growth of the eye, which can lead to myopia or nearsightedness by lengthening the eye.



In the United States, nearsightedness rose from only 25% in 1970 to 40% of the population by 2000. In a virtual environment, the human interaction is changed by tricking the brain by projecting object onto eyes that looks far away but in reality, it is only very close to the eyes. With VR, it's easy to become immersed in out-of-body experience and brain sees it as similar to a real world experience. Loud audio can be damaging to ears. Flickering objects that come too fast or too close to eyes can produce eye strain. With pregnant and elderly, virtual reality experience may cause vision abnormalities, psychiatric disorders, heart conditions. If the content is violent or anxiety provoking, it can make the body to react physically, increasing the heart rate and blood pressure. It can also cause psychological reactions, including anxiety, fear, or stress Disorder. Children are more susceptible to confusing virtual reality with the real world.

Sensory Deprivation

Virtual Reality is sensory deprivation. When Virtual reality becomes part of day-to-day life, most will prefer to spend time in virtual spaces that could lead to self-imposed social isolation and physical withdrawal from society. The concept of life lived outside of regular society is unhealthy. When brain and machine interface is encouraged as is the case, the human brain is more like conditioned and mechanical. The brain and environment are inseparable. Genetic expression is triggered by the environment and not by technology. Study after study, prolonged exposure of VR headsets or immersion technology is liked with educational, social, personal and health illness.



Impacts on Copyright and Privacy

There are privacy policies and data collection issues in virtual reality platforms. Companies are already collecting head movements and eye movements from VR gadgets, and possibly health information such as heart rate, body temperature, and sweat level without having consent from users. There are Trademarks and copyright issues in VR technology as well such as virtual characters wearing Reebok T-Shirt or virtual characters assaulting someone or some company.

How can these ethical issues or concerns be abused?

Virtual Reality innovative immersion technology brings lot of benefits in almost everything we do nowadays. The introduction of any new innovation will have both positive and negative impacts. Though the benefits of

technology revolution reach most of the population, there will be a section of population impacted negatively. Though airline pilot training or battlefield rehearsal VR simulation are on the benefits column, for an example, may cause social unrest by involving in anti-social activities such as crimes, drug abuse, and theft etc., and becoming social burden rather social influencer in a positive way. VR technology innovations can be abused to hurt in varying degree. This could be anywhere between intruding someone's privacy by taking violent activities or compromising pictures and publishing as games in social media, threatening, stalking, kindling hopelessness with the intend to hurt the individuals or groups or to target a specific ethical groups OR by turning them as weapons against them as they are programmed by humans. With so many terrorism events happening around the world in the name of religion, ethnicity, skin color, inequality, VR technology can be misused or abused for their ill intentions.

what could be done to prevent or limit these ethical issues?

We all know technology innovations in the form VR, immersion or simulation is inevitable and everyone should start enjoying the phenomenon rather worrying about it. Change is the only one that never stops changing. If the basic needs, fundamental rights, and privacy of every individual are met, ethical issues are of no concern and it is an indication of healthy and prosperous society. When a change of any kind, whether it is VR or automation or Robotics or AI, affects the individual in their daily activities, social security, rights, freedom in the form job security, financial instruments, privacy, it is not just the individual gets affected but also the communities that we all live-in. Unlike the changes which were slowly introduced in early industrial revolution days where there was time to address ethical issues. In the case of VR, changes are happening in a faster rate and the impacts are much faster and sudden that many cannot take in. Good governance, regulation of technologies, risk analysis in the context of ethical issues, human dignity, inclusiveness which would lead to good policies will prevent and limit ethical issues. The introduction of changes can be governed and can be introduced into the society by stipulating good policies, and making changes to the existing policies, rules and laws. This will bring confidence and assurance among everyone to meet the challenges in emerging IT landscape.

References

<http://www.realitytechnologies.com/virtual-reality>

<https://www.livescience.com/53392-virtual-reality-tech-uses-beyond-gaming.html>

<https://www.theguardian.com/technology/2016/nov/10/virtual-reality-guide-headsets-apps-games-vr>

<http://rocketproductions.com.au/blog/where-does-virtual-reality-belong-2/>

<http://www.skills2learn.com/virtual-reality-benefits.html>