VIRTUAL REALITY: THE REAL LIFE CONSEQUENCES

ROYA BAGHERI*

ABSTRACT

Virtual Reality has emerged as the next major technology to impact industry and change business models. As it expands into various markets and becomes more prevalent in society, proper regulations should be put in place to protect consumers and address widespread legal issues. This paper discusses the history and growth of Virtual Reality technology, the major legal concerns that loom over its expansion, and proposed recommendations on regulations and safeguards. The paper argues that in order to balance innovation and consumer protection, privacy should be immediately regulated, but the other legal issues of intellectual property, physical and torts risks, and first amendment rights should only be regulated as and when the issues emerge.

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*Roya Bagheri, UC Davis School of Law, 2017; B.A., Boston College, 2013. I would like to thank the UC Davis Business Law Journal for giving me the opportunity to publish this paper and for their excellent editorial work. I'm very grateful to Professor Albert Lin, Khushi Desai and my family for their support.

I. INTRODUCTION

Virtual reality is here. It has long since materialized out of the pages of science fiction and is rapidly expanding its presence in our day to day lives. We are now entering an era where it is possible to experience a whole new immersive interactive environment from the comfort of our own living rooms. The potential of this technology is immeasurable and its recent evolution has been overwhelming. With today's exponential growth in computer processing power and technological advancement, virtual reality is expanding into multiple facets of our daily lives. Imagine a world where students can experience living history, where real estate agents can give immersive house tours cross-country, where psychologists can create safe environments for treatment. These situations are all becoming a reality as virtual reality expands in the economic marketplace.

Current data shows that since 2010, virtual reality companies have seen over $4 billion dollars in investments, across over 350 deals, with no indication that this momentum will slow.[1] Eight of the top ten technology companies in the world have invested in virtual reality development.[2] Even this list leaves out major virtual reality competitors such as Facebook, Sony, LG and HTC, all of which have developed commercial VR headsets. Analysts at Goldman Sachs recently forecast that virtual reality "has the potential to spawn a multibillion-dollar industry, and possibly be as game changing as the advent of the PC."[3] Their market research projects the base level of virtual reality industry revenue at $80 billion dollars by 2025, while an accelerated uptake scenario puts it at a massive $182 billion dollars.[4] According to research from Canalys, a leading global technology market analyst firm, vendors are estimated to ship 6.3 million virtual reality headsets globally in 2016.[5] Although the virtual reality market is currently dominated by the video game industry, it has the potential to impact a variety of industries and evolve their business models. Goldman Sachs outlined the nine biggest markets for virtual reality as videogames, live events, video

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[1] Naader Banki & Jordan Pritchett, *Legal Issues in VR*, MANATT (Mar. 23, 2016), https://www.manatt.com/manatt-digital-media/Legal-Issues-in-VR.aspx.

[2] Will Mason, *8 of the Top 10 Tech Companies in the World Are Invested in VR/AR*, UPLOAD (Mar. 8, 2016), http://uploadvr.com/8-of-the-top-10-tech-companies-invested-in-vr-ar.

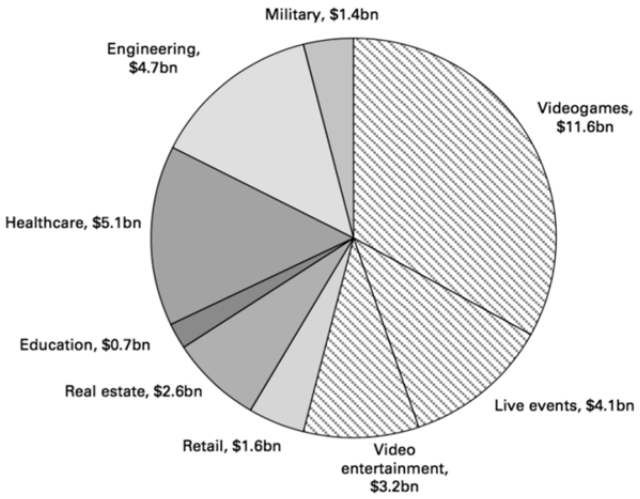
[3] Julie Verhage, *Goldman Sachs Has Four Charts Showing the Huge Potential in virtual and Augmented Reality*, BLOOMBERG (Jan. 13, 2016), http://www.bloomberg.com/news/articles/2016-01-13/goldman-sachs-has-four-charts-showing-the-huge-potential-in-virtual-and-augmented-reality.

[4] *Id.*

[5] Arjun Kharpal, *Samsung Gear VR: Over one million people used the technology last month*, CNBC (May 11, 2016), http://www.cnbc.com/2016/05/12/samsung-gear-vr-over-one-million-people-used-the-technology-last-month.html.

entertainment, healthcare, real estate, retail, engineering and military.[6] *See Chart Below*.

Exhibit 4: Our 2025 base case VR/AR software assumptions by use case



Source: Goldman Sachs Global Investment Research.

As virtual reality continues to expand into these various markets and becomes prevalent in society, we must ensure that there are proper regulations in place to protect consumers and address widespread legal issues. In order to balance innovation and consumer protection, privacy should be immediately regulated. However, other legal issues that relate to intellectual property, physical and torts risks, and first amendment rights should be regulated only as they emerge. This paper discusses the growth of virtual reality technology, the major legal concerns that loom over its expansion, and proposed recommendations for regulations and safeguards as the technology continues to advance.

II. WHAT IS VIRTUAL REALITY?

Virtual reality, commonly shortened to "VR", is a computer generated three dimensional world that simulates a user's physical presence and allows the user to interact with objects in that world.[7] This virtual world is meant to be

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[6] *Profiles in Innovation: virtual & Augmented Reality*, GOLDMAN SACHS, 8 (Jan. 13, 2016), http://www.goldmansachs.com/our-thinking/pages/technology-driving-innovation-folder/virtual-and-augmented-reality/report.pdf.

[7] Mary C. Kelly & Jack N. Bernstein, Comment, *virtual reality: The Reality of Getting It Admitted*, 13 J. MARSHALL J. COMPUTER & INFO. L. 145, 151 (1994); Jack Russo & Michael Risch,

experienced as the real world is: through artificial sensory experiences of sight, sound, touch and smell.[8] Virtual reality environments are promoted as a means to free oneself from the traditional confines of the physical body.[9] However, virtual reality technology relies heavily on the physical body. It reacts directly to typical body movements and sensations to translate the physical information into a virtualized environment to create the experience of immersion.[10] Immersion is the key feature of the current development of virtual reality.[11]

There have traditionally been two different types of virtual reality.[12] The less commonly known type of virtual reality is "Desktop" VR, which presents three dimensional images on a high resolution computer screen.[13] The more common and rapidly expanding form of virtual reality is known as "immersion" VR.[14] Immersion virtual reality involves a wearable headgear that contains video screens and audio attachments allowing users to see and hear the virtual world.[15] The equipment tracks a user's movements and modifies the graphics to correspond to physical movements, so what a user sees changes as their perspective changes.[16] Although both forms of virtual reality allow a user to control movement and interaction within the virtual world, immersion virtual reality technology and headsets are rapidly growing and being praised as the future of computers.[17]

III. HISTORY OF VIRTUAL REALITY

From iPhones to drones, over the past few decades many of the technological advances that were only dreamed of in science fiction have amazingly become reality. In the 1930's the science fiction story *Pygmalion's Spectacles* by Stanley G. Weinbaum describes a pair of goggles that contain "a movie that gives one sight and sound [. . .] taste, smell, and touch. [. . .]You are in the story, you speak to the shadows [characters] and the shadows reply, and

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The Law of virtual reality, LAWYERS FOR THE INTERNET ECONOMY (1993), http://www.computerlaw.com/Articles/The-Law-of-virtual-Reality.shtml; Michael Sliwinski, *Making Reality virtual: The Rising Tide of virtual reality*, LAW STREET (Aug. 16, 2015), http://lawstreetmedia.com/issues/technology/making-reality-virtual-rising-tide-virtual-reality; FEI HU, VIRTUAL REALITY ENHANCED ROBOTIC SYSTEMS FOR DISABILITY REHABILITATION (2016).

[8] Sliwinski, *supra* note 7.

[9] Jonathon W. Penney, *Privacy and the New virtualism*, 10 YALE J. L. & TECH. 194, 220 (2008).

[10] *Id.*

[11] Sliwinski, *supra* note 7.

[12] Kelly & Benstein, *supra* note 7

[13] *Id.*

[14] *Id.*

[15] *Id.*

[16] *Id.*

[17] *Id.*

instead of being on a screen, the story is all about you, and you are in it."[18] This is an uncanny description of what current virtual reality technology headsets are attempting to provide users. It took many failed experiments, patents and products over the past century to get virtual reality successfully out of the pages of science fiction and into consumer hands.

The first attempts at virtual reality can be traced back to the 1950s with the creation of the Sensorama by cinematographer Morton Heilig.[19] Eventually patented in 1962, the Sensorama was an "arcade style theater cabinet" that attempted to stimulate all the senses with a stereoscopic 3D display, fans, smell generators and a vibrating chair.[20] A year later in 1961, two engineers created "the headsight" which was a head mounted display (HMD) that incorporated a rudimentary motion tracking system. Although the headsight didn't have computer and image generation integration, it was the first step in the evolution of the virtual reality headset.[21]

In 1965, Ivan Sutherland, often referred to as the father of VR, took a massive step in the pursuit of virtual reality by imagining "the ultimate display" concept to form "a room within which the computer can control the existence of matter."[22] He turned his idea into a prototype with a tracking system built into the head mount called the "Sword of Damocles" in 1968. The system was suspended from the ceiling and required the user to be strapped into the device.[23]

In the 1970s and 1980s, there were large advancements in computers, as well as flight simulators. This continued the advancement of virtual reality technology in the private sector, as well as in military and government agencies like NASA.[24] Even with all of the development within the field, there was still was no term available to describe the technology.[25] Jaron Lanier, founder of the visual programming lab (VPL) finally coined the term "virtual reality" in 1987 to describe the research area.[26]

The 1990s saw a period of growth within the arcade and video game sector.[27] In 1991, Virtuality Group Arcade Machines created a range of virtual

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[18] *"Pygmalion's Spectacles," Probably the First Comprehensive and Specific Fictional Model for virtual reality*, HISTORY OF INFORMATION (1935), http://www.historyofinformation.com/expanded.php?id=4543 (last visited Feb. 10, 2017).

[19] Sliwinski, *supra* note 7.

[20] *History of virtual reality*, VIRTUAL REALITY SOCIETY, http://www.vrs.org.uk/virtualreality/history.html (last visited May 11, 2016).

[21] *Id.*

[22] Adi Robertson & Michael Zelenko, *Voices from a virtual Past*, VERGE, http://www.theverge.com/a/virtual-reality/oral_history (last visited May 11, 2016).

[23] *Id.*

[24] Sliwinski, *supra* note 7.

[25] *History of virtual reality*, *supra* note 20.

[26] *Id.*

[27] *Id.*

reality arcade games and machines.[28] In 1993, SEGA announced the Sega VR headset for the Sega Genesis Console. However, due to difficulties that arose in technical development, the headset never made it past the prototype and resulted in a large financial loss for SEGA.[29] In 1995, Nintendo failed to enter the market with the Nintendo Virtual Boy.[30] Despite the initial widespread interest in virtual reality video games, the string of failures led to a substantial withdrawal in research and production of the technology by the late 90s.[31]

Throughout the late 90s and early 2000s, the "death of VR" became a standard narrative and the few virtual reality companies that still operated had a much lower profile.[32] Research largely shifted to the military and despite advances in 3D graphics, there was little to no association with "virtual reality."[33] In spite of the rapid advances in personal computing, virtual reality development was essentially dormant until 2012. In 2012, the Oculus Rift was revealed through a Kickstarter campaign. This triggered a widespread virtual reality resurgence.[34]

IV. CURRENT VIRTUAL REALITY TECHNOLOGY

Investment in the field of technology is booming now that we are in an age of virtual reality's resurgence. The major differences between the present virtual reality age and its predecessor of the 90's are the current technological advancements and subsequent resources. This time around, major technology giants have been funding the progress and dedicating resources necessary to drive innovation. Goldman Sachs created a timeline to illustrate the major players and current investments gaining traction.[35] *See chart below*:

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[28] *Id.*
[29] *Id.*
[30] *Id.*
[31] *Id.*
[32] Robertson & Zelenko, *supra* note 22.
[33] *Id.*
[34] *Id.*; Sliwinski, *supra* note 7.
[35] *Profiles in Innovation*, *supra* note 6.

Exhibit 7: Recent involvement in virtual reality by technology giants

Company	Date	Details
Qualcomm	Jan-12	Raised seed funding for the mobile augmented reality startup Blippar
Google	Apr-12	Introduced augmented reality glasses, Google Glass, to the public
Sony	Mar-14	Sony announces Project Morpheus, later renamed PlayStation VR
HP	Mar-14	Launched Aurasma 3.0, an augmented reality platform that it acquired through Autonomy
Facebook	Mar-14	Acquired Oculus, a virtual reality startup, for $2bn
Samsung	Sep-14	Revealed its own head-mounted display, Samsung Gear VR, partnering with Oculus
Google	Oct-14	Invested $542mn in the startup Magic Leap
Intel	Apr-15	Invested in Series A funding for the virtual reality startup WorldViz
Apple	May-15	Reportedly acquired Metaio, an augmented reality software maker
Disney	Sep-15	Led a $65mn funding round in Jaunt, a VR content startup
Microsoft	Oct-15	Acquired Havok, a 3D physics engine used for videogames
Comcast & Time Warner	Nov-15	Participated in a $30.5mn funding round for NextVR, which captures live events in VR
Apple	Nov-15	Acquired Faceshift, a facial recognition capture and animation company
Fox	Jan-16	Acquired minority stake in Osterhout Design Group, a VR/AR HMD maker

Source: News sources, compiled by Goldman Sachs Global Investments Research.

The biggest current virtual reality technology products are the: Google Cardboard, Samsung Gear VR, HTC Vive, PlayStation VR, and of course the Oculus Rift. The Google Cardboard and the Samsung Gear VR are the two most accessible forms of virtual reality because they are powered by existing smartphones and cost less than a hundred dollars. The PlayStation VR, in contrast, is unique because it is the only virtual reality device powered by an existing video game console.[36] The HTC Vive and Oculus Rift are the two most popular VR devices designed to run off personal computers ("PCs").

The Oculus Rift is arguably the most recognized name in virtual reality because it jumpstarted the new virtual reality rush after its Kickstarter popularity in 2012.[37] In March of 2014 Mark Zuckerberg announced Facebook's acquisition of Oculus for more than $2 billion dollars.[38] The Oculus headset includes a brilliant OLED display and 360-degree positional head-tracking technology to fully immerse the viewer.[39] Mark Zuckerberg indicates that Facebook not only intends to take Oculus far beyond gaming and has said that virtual reality "is really a new communication platform."[40] Accordingly, Zuckerberg also invites people to "imagine enjoying a court side seat at a game, studying in a classroom

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[36] Sherri L. Smith, *VR Headset Mega Guide: Features and Release Dates*, TOM'S GUIDE (Apr. 5, 2016), http://www.tomsguide.com/us/vr-headset-guide,news-20644.html.

[37] Sliwinski, *supra* note 7.

[38] Max Chafkin, *Why Facebook's $2 Billion Bet on Oculus Rift Might One Day Connect Everyone on Earth*, VANITY FAIR (Sep. 8, 2015), http://www.vanityfair.com/news/2015/09/oculus-rift-mark-zuckerberg-cover-story-palmer-luckey.

[39] Smith, *supra* note 36.

[40] Mark Zuckerberg, FACEBOOK (Mar. 25, 2014), https://www.facebook.com/zuck/posts/10101319050523971.

of students and teachers all over the world or consulting with a doctor face-to-face—just by putting on goggles in your home."[41]

All of the massive technology companies, including Facebook, have invested in virtual reality, knowing it will transcend its current videogame focus into broader platforms. For example, Goldman Sachs identifies nine major markets that virtual reality is set to disrupt: videogames, live events, video entertainment, healthcare, real estate, retail, engineering and military.[42] These nine categories are subsequently divided into consumer driven markets, enterprise driven markets and public sector spending.[43] As virtual reality expands into these markets and creates new platforms that have the potential to reach millions of people around the world, we need to look at the potential ramifications and anticipate the legal issues that might emerge.

V. MAJOR LEGAL ISSUES ASSOCIATED WITH VIRTUAL REALITY

As the supply of virtual reality devices increases and the use of the technology expands, consumers, developers and manufacturers will likely soon be confronted with a range of legal issues. Given that virtual reality is an entirely new medium, it is unknown what legal complications may arise in relation to virtual reality headsets.[44] The technology has progressed at a speed faster than the law and therefore, there is little, if any, regulation of the market. There is also the question as to whether new laws should be created or modified to adjust with existing law.[45] No precedent exists for virtual reality, meaning that any legal disputes will mostly be handled on an ad hoc basis.[46] Furthermore, while there are cases from comparable mediums, such as film, music, video games, board games, and amusement parks, that can serve as guidelines for virtual reality, VR headsets have an unparalleled level of interactivity, thereby creating novel deviations to different legal issues.[47]

The likelihood of major legal issues arising will potentially range from privacy risks, to products liability and physical torts cases, to various IP issues such as copyright, and even first amendment freedom of speech claims.[48] The legal implications of the technology are also largely being shaped by the User

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[41] *Id.*
[42] *Profiles in Innovation*, *supra* note 6.
[43] *Id.*
[44] Banki & Pritchett, *supra* note 1.
[45] *Virtual reality Gaming Will Challenge Existing Laws*, KELLY DRYE (Oct. 1, 2015), http://www.kelleydrye.com/news/in_the_media/2033.
[46] Banki & Pritchett, *supra* note 1.
[47] *Id.*
[48] William T. Um, *New Economy Businesses Need New Insurance*, KILPATRICK TOWNSEND (Oct. 29, 2015, 2:32 PM), http://www.kilpatricktownsend.com/en/Knowledge_Center/Publications/Articles/2015/10/New_Economy_Businesses_Need_New_Insurance.aspx.

Licensing Agreements of the individual products, such as the "Terms of Use" provided for the Oculus Rift.[49] The following sections will analyze each major legal issue associated with virtual reality technology and look to videogame law for comparable precedent, as it is the most similar medium in terms of function, technology and consumer base.

A. Privacy

Privacy concerns have been a central issue associated with emerging technologies, and our new societal norm of being constantly connected. For example, Facebook generates $5.6 billion dollars a year by monitoring all of our online activity and feeding the data to marketers.[50] Seeing as Facebook owns the foremost virtual reality company Oculus, legal privacy concerns should be at the forefront of any dialogue about virtual reality regulation.

Within a virtual environment, every single behavior can be tracked and manipulated, dramatically expanding the scope of potential privacy concerns.[51] Within virtual reality worlds data can be categorized as either involving identifiable personal information (IPI) or non-identifiable personal information (non-IPI).[52] IPI is information about personal characteristics of the user including culture, age, religion, employment, credit history, and personal contact information.[53] Non-IPI usually refers to "in-world" information about virtual activities within the virtual world that do not link the online persona to the user's actual identity. In general, IPI receives much more privacy protection than non-IPI. However, because the virtual reality technology is so new, it is unclear whether there is an expectation of privacy for non-IPI activities.[54] Violations of consumer privacy could result in companies being investigated by the FTC and state regulators.[55]

Facebook's Oculus Rift is already in hot water with many critics, consumers and even a member of Congress for the privacy concerns that have emerged out of its terms of service. Essentially, when users agree to Oculus' Terms and Conditions agreement, they give Oculus the right to automatically collect and share data regarding where and how they interact with their virtual

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[49] Webber Wentzel, *Regulating a virtual reality: Can We Keep Up?*, WRITE CANDIDATE (Feb. 11, 2015), http://thewritecandidate.co.za/regulating-virtual-reality-can-keep/; Andrew Liptak, *There Are Some Super Shady Things in Oculus Rift's Terms of Service*, GIZMODO (Apr. 2, 2016, 9:17 PM), http://gizmodo.com/there-are-some-super-shady-things-in-oculus-rifts-terms-1768678169.

[50] Will Mason, *Oculus 'Always On' Services and Privacy Policy May Be a Cause for Concern*, UPLOAD (Apr. 1, 2016, 6:03 AM), http://uploadvr.com/facebook-oculus-privacy/.

[51] Maria Korolov, *The Real Risks of virtual reality*, RISK MANAGEMENT (Oct. 1, 2014), http://www.rmmagazine.com/2014/10/01/the-real-risks-of-virtual-reality/.

[52] Penney, *supra* note 9, at 222.

[53] *Id.*

[54] *Id.*; Korolov, *supra* note 51.

[55] *Id.*

reality experience. This includes their physical movements and dimensions, GPS location information, information on how they access the services, what they install, and various other activities.[56] The Oculus Rift is also the type of device that is always on and regularly sends updates back to Facebook's servers. This leads to further concerns about when the information will be collected.[57] Oculus Rift's Terms set a dangerous precedent for other virtual reality devices with regard to privacy.

Senator Al Franken (D-Minnesota), who sits on the Senate Privacy and Technology Subcommittee wrote an open letter to Oculus VR on April 7, 2016 responding to their Terms of Service and asking it to provide more information on how it is addressing the issue of privacy.[58] The involvement of a US Senator illustrates how significant the privacy concerns are within the field of virtual reality, and could lead to direct legal regulation from Congress to protect consumer information. However, there have been similar events and concerns associated with videogame consoles that have not led to any reform or change in privacy attitudes.

Videogame consoles provide the most direct comparison for the analysis of current privacy laws, trends and attitudes. Modern videogame companies and consoles have expanded the amount of data that they record and have thus been confronted by a series of privacy debates in recent years. In April 2011, PlayStation Network (PSN) was hacked, leading to one of the largest data breaches in history.[59] The hack compromised the personal data and credit card information of over 77 million users.[60] This led to public, media, and governmental outcry and demands for change. However, besides the $171 million dollars that the hack cost Sony, there were no further repercussions or changes in privacy protection.[61]

In 2013, Microsoft was also the target of privacy related outcry when it announced that its Xbox One's Kinect camera feature would need to be

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[56] Liptak, *supra* note 49; *Oculus Terms of Service*, OCULUS VR, LLC, https://www.oculus.com/en-us/legal/terms-of-service/ (last updated Mar. 28, 2016).

[57] Mason, *supra* note 50.

[58] Al Franken, *Sen. Franken Questions Oculus Rift on How It Collects and Shares Personal Information*, AL FRANKEN (Apr. 7, 2016), https://www.franken.senate.gov/?p=press_release&id=3411; Andrew Liptak, *Oculus Rift's Terms of Service Are Now Attracting Questions From a Member of Congress*, GIZMODO (Apr. 10, 2016, 4:33 PM), http://gizmodo.com/oculus-rifts-terms-of-service-are-now-attracting-questi-1770169449.

[59] Karen Petruska & John Vanderhoef, *TV That Watches You: Data Collection and the Connected Living Room*, 34.2 SPECTATOR 33, 37 (Fall 2014). http://www.academia.edu/7801456/TV_That_Watches_You_Data_Collection_and_the_Connected_Living_Room.

[60] *Id.*

[61] *Id.*

connected and always on in order to function properly.[62] This triggered massive concern about the camera's surveillance capabilities and questions about how the data would be stored and used.[63] Publicity over the Kinect camera feature led to an analysis about the differences in US privacy laws and European privacy laws.[64] Professor Joshua Fairfield from Washington and Lee School of Law explains that "Europeans think that the right to privacy is more robust, and require consumers to affirmatively opt in to monitoring programs, rather than opting out, which is the U.S. rule."[65] There were also concerns that the always on camera would violate the recently amended Children's Online Privacy Protection Act ("The Act"). The Act requires operators of websites or online services directed to children to obtain parental consent when collecting personal information from a child under the age of 13.[66] However, despite all of the privacy concerns and outcry, no new protective actions were taken by the government, and Microsoft moved forward with its product with little to no repercussions.[67]

As illustrated by videogame console examples, privacy and data regulation in the United States is minimal and consent driven. Although decisional privacy, which ensures personal autonomy in making personal decisions, is protected under the Fourteenth Amendment, there is currently no provision in the U.S. Constitution that has been recognized to provide protection for informational privacy.[68] Informational privacy has been defined as the "'right to be let alone' – to avoid disclosure of personal information about oneself, either to the government or to the world at large."[69] It has been suggested that informational privacy protection can develop out of the of the 'zone of privacy' apparent in the 'penumbras' of the Constitution and Fourteenth Amendment noted in *Griswold v. Connecticut* and *Roe v. Wade*.[70] Since *Roe*, the court has acknowledged several fundamental rights under decisional privacy: "marriage, procreation, contraception, family relationships, child rearing, education" and

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[62] Yannick LeJacq, *Game on for surveillance? Privacy advocates concerned over new consoles*, NBC NEWS (July 25, 2013), http://www.nbcnews.com/technology/game-surveillance-privacy-advocates-concerned-over-new-consoles-6C10732136.

[63] *Id.*

[64] Emily Gera, *Can your next-gen console spy on you?*, POLYGON (Nov. 5, 2013), http://www.polygon.com/2013/11/5/5054400/can-your-xbox-one-spy-on-you.

[65] *Id.*

[66] 16 C.F.R. § 312.5 (2013); David Tashroudian, *Will Kinect 2.0 and COPPA Play Well Together?*, IAPP (Sep. 18, 2013), https://iapp.org/news/a/will-kinect-2.0-and-coppa-play-well-together.

[67] Petruska & Vanderhoef, *supra* note 59, at 38.

[68] Sara Stratton, Note, *Passwords Please: Rethinking the Constitutional Right to Informational Privacy in the Context of Social Media*, 41 HASTINGS CONST. L.Q. 649, 666 (2014).

[69] Timothy Azarchs, Comment, *Informational Privacy: Lessons from Across the Atlantic*, 16 U. PA. J. CONST. L. 805, 805-806 (2014).

[70] Jonathon Penney, *Privacy and the New Virtualism*, 10 YALE J. L. & TECH. 194, 244 (2007-08).

"certain intimate conduct."[71] Considering that an aspect of virtual reality is decision based, it might be possible to extend the Fourteenth Amendment decisional privacy protection to decisions made within a virtual reality world. However, the majority of the privacy concerns surrounding the technology firmly fall under the unprotected category of informational privacy.

Informational privacy has thus far been addressed by the Supreme Court in the following cases: *Whalen v. Roe*, *Nixon v. Administrator of General Services*, *NASA v. Nelson*, and *United States v. Jones*.[72] Despite the discussions of informational privacy in these cases, the court has yet to clarify if there is a right to informational privacy, what level of scrutiny would be applied, or what might infringe upon this possible right.[73] The lower courts are fractured on the issue, with the majority ruling in favor of a broad right to informational privacy along with a form of heightened scrutiny.[74] State law does not provide any further clarification because state remedies do not cover the full range of privacy issues and mostly only provide protection if there has been dissemination of "highly offensive" private matters to a wide audience.[75] Therefore, it is not likely that state law or existing informational privacy case law will provide much protection for the valuable private information that is at risk through the use of virtual reality technology.

Perhaps the emergence of virtual reality will bring about a change in privacy rights and legislation. However, there is concern that it could follow the precedent set by videogame consoles and remain relatively unregulated. As virtual reality technology continues to become ingrained in day-to-day society and expands the scope of what data is tracked and collected, hopefully it will trigger greater legal privacy protection for users across multiple platforms.

B. Intellectual Property:

With the growth of virtual reality "worlds" comes a number of legal questions about how different players will be able to create, use and enforce their intellectual property within virtual reality.[76] In general, copyrighted or trademarked content that is uploaded into a virtual reality world is protected by the same standards that would apply in the real world setting.[77] Any created coded content that is sold within a virtual reality world is protectable by

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[71] Stratton, *supra* note 68, at 667.
[72] Azarchs, *supra* note 69, at 809-815.
[73] *Id.* at 815.
[74] *Id.* at 816.
[75] *Id.* at 818.
[76] Jonathan M. Purow, *Virtual Reality May Create Novel IP Issues In The Real World*, LAW 360 (Mar. 28, 2016) http://www.law360.com/articles/769479/virtual-reality-may-create-novel-ipissues-in-the-real-world.
[77] *Id.*

copyright.[78] Any brands which are developed and sold within a virtual reality world can be registered as a trademark.[79] However there are likely possible twists in these rights as there are questions as to what is original and capable of copyright and trademark protection within a virtual environment.[80]

Case precedent in videogame law suggests that current copyright and trademark laws can be used to analyze any potential infringement within virtual reality. For example, in 2008 the Ninth Circuit ruled in *E.S.S. Entm't 2000, Inc. v. Rock Star Videos, Inc.* that trademark law and the Lanham Act could be extended to virtual strip clubs within the videogame Grand Theft Auto.[81] The court applied the *Rogers v. Grimaldi* two-pronged test, stating that an artistic work's use of a trademark that otherwise would violate the Lanham Act is not actionable "unless the [use of the mark] has no artistic relevance to the underlying work whatsoever, or if it has some artistic relevance, unless [it] explicitly misleads as to the source or the content of the work."[82] Therefore because the videogame was found to be "artistic," it did not violate trademark law.[83] Accordingly, virtual reality content will likely fall into the same "artistic" category as videogames and therefore likely receive the same trademark protections. Furthermore, virtual reality case law may mimic the trajectory of video game case law, with IP rights developing through case law as the technology progresses.

As with videogames, the Terms of Service and use for virtual reality products will likely attempt to divert traditional ownership of intellectual property to the virtual reality provider company.[84] For example, Oculus' terms of service provide that if you create something using Oculus' services, you surrender all rights to that work and Oculus may use it for its own purposes at any time.[85] For example, if a developer creates interactive artwork within Oculus, Facebook can then use it for an advertisement without the developer's permission.[86] It is still unclear whether this contract will be found to be unconscionable and if that result may transform intellectual property rights within virtual reality.[87]

Existing trademark and copyright law coupled with well drafted terms of service can govern the majority of current interactions between companies,

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[78] V*irtual reality Creates Potentially Real Legal Issues*, VENABLE LLP (July 9, 2015), https://www.venable.com/virtual-reality-creates-potentially-real-legal-issues-07-09-2015/.

[79] *Id.*

[80] *Id.*

[81] E.S.S. Entm't 2000, Inc. v. Rock Star Videos, Inc., 444 F. Supp. 2d 1012, 1014 (C.D. Cal. 2006), *aff'd* 547 F.3d 1095 (9th Cir. 2008).

[82] *Id.* at 1037.

[83] *Id.*

[84] Liptak, *supra* note 49.

[85] *Id.*; *Oculus Terms of Service*, OCULUS VR, https://www.oculus.com/en-us/legal/terms-of-service/ (last updated Mar. 28, 2016).

[86] *Id.*

[87] Purow, *supra* note 76.

creators, users and world owners in virtual worlds. Nevertheless, the evolving nature of virtual reality will prompt novel IP questions that will need to be addressed by either technological fixes, legislation or new case law.[88]

C. Physical and Torts Risks

Virtual reality headsets are still technically new and experimental devices with the potential for real world injuries and resulting torts product liability legal concerns. Of the various legal issues associated with virtual reality, "consumer safety, products liability, and tort/negligence appear to be the most glaring issues."[89] One of the widespread concerns that remains is motion sickness, also known as "virtual reality sickness."[90] Within the first several weeks that the Oculus and HTC Vive were released and reviewed, many cases of nausea had been reported.[91] The US Army has deemed the Oculus Rift and related devices as too risky for soldier training purposes.[92] Douglas Maxwell, science and technology manager at the U.S. Army Simulation and Training Technology Center, explained that "if one of these devices makes me or my staff sick, there is no chance that I will put it in front of a solider."[93] Going beyond mere nausea, there are concerns of long term brain damage as a result of the full-screen immersion by devices like the Oculus Rift.[94] Biomedical Engineer and augmented reality "genius" Rony Abovitz has advised that "the brain is very neuroplastic. . . and there is no doubt that near-eye stereoscopic 3D systems [like the Rift] have the potential to cause neurologic change."[95] However, given the novelty of the technology, it is too soon to determine whether or not virtual reality devices will in fact have negative cognitive side-effects.

Nevertheless, while companies are actively working to reduce the physical risks associated with the technology, there is potential for a long latency period. Other physical risks have the potential to emerge years down the line.[96] In the event of uncovered cognitive damage or other safety disputes, users will likely attempt to sue on the basis of strict liability for products defects. Other

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[88] *Id.*
[89] Banki & Pritchett, *supra* note 1.
[90] Kirk Hamilton, *One Wild, Occasionally Nauseating WeekOof virtual reality With The Oculus Rift*, KOTAKU (Mar. 28, 2016, 10:00 AM), http://kotaku.com/one-wild-occasionally-nauseating-week-of-virtual-reali-1767442615.
[91] *Id.*
[92] Korolov, *supra* note 51.
[93] *Id.*
[94] Chafkin, *supra* note 38.
[95] *Id.*
[96] Eric Johnson, *Legal Danger: What We Don't Know About virtual reality Today Might Hurt Companies Tomorrow*, RECODE (Aug. 11, 2015, 12:18 PM), http://recode.net/2015/08/11/legal-danger-what-we-dont-know-about-virtual-reality-today-might-hurt-companies-tomorrow/.

potential claims include negligence, breach of warranties, and breach of consumer protections acts.[97]

The potential health hazards create a lot of legal uncertainty for both the companies and consumers. This is resulting in massive warnings and safeguards placed within the terms of service in order to potentially shield companies from personal injury and liability suits.[98] The Oculus Terms of Service include numerous safety warnings for discomfort, seizures, avoiding injury from your surroundings, repetitive stress, interference with medical devices and risk to children.[99] Also included are fixed arbitration clauses and bars on class action lawsuits.[100] While these warnings and terms of use greatly reduce the ability for consumers to sue and recover with traditional torts remedies, there are no common comparisons that help provide guidance to do so.[101]

Nintendo provides the best example of a company dealing with analogous tort claims, stemming from the danger of their Wii remotes.[102] A series of lawsuits claimed that the Wii remotes were unsafe after they flew from people's hands and crashed into TVs and injured other people.[103] Nintendo won the lawsuits because of the clear warnings and safety cards about proper usage that shipped along with the console.[104] Users or bystanders that suffer damage as a result of virtual reality devices will, like the Nintendo users, attempt to sue. However as illustrated by the Nintendo litigation, it will be very difficult for plaintiffs to recover because of the plethora of safety warnings and clauses that ship along with virtual reality products.

As the technology incorporates the efforts of both of hardware makers and application developers, there is also the question of source of liability.[105] Current case law in comparable industries demonstrates a pattern of the cases being resolved in favor of defendants involved in "the creation and dissemination of creative works." [106] Ultimately however, only time will truly tell how these legal issues associated with virtual reality, and inevitable cases will be resolved.

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[97] David Hoppe, *Collateral Damage: Real Legal Risks for virtual reality Companies*, GAMMA LAW (Jan. 6, 2016), http://gammalaw.com/collateral-damage-real-legal-risks-for-virtual-reality-companies/.

[98] Sean Morrison, *Oculus Rift – Legal Issues in the virtual World*, SEAN MORRISON LAW OFFICES LLC (Mar. 26, 2014), http://seanmorrisonpllc.com/2014/03/26/oculus-rift-legal-issues-virtual-world/.

[99] *Oculus Health and Safety Warnings*, OCULUS VR, LLC, https://www.oculus.com/en-us/legal/health-and-safety-warnings/ (last visited Feb. 10, 2017).

[100] *Oculus Terms of Service*, *supra* note 56.

[101] Johnson, *supra* note 96.

[102] Morrison, *supra* note 98.

[103] *Id.*

[104] *Id.*

[105] *Id.*

[106] *Id.*; Banki & Pritchett, *supra* note 1.

D. First Amendment Freedom of Speech

Virtual reality is providing users with an unprecedented level of interactivity and the ability to fully immerse a user in experiences.[107] As such, it is expected that virtual reality content will lead to debates about the First Amendment right to freedom of speech. It has long been established that film and television portrayals of gratuitous violence and torture are protected by the First Amendment. What happens when virtual reality makes it possible to not only watch, but experience and perpetrate violence?[108] Should the First Amendment be used to protect this form of conduct that is otherwise rejected in civilized society?

For purposes of freedom of speech extension, the leading field of comparison is videogame law.[109] In *Brown v. Entertainment Merchants Association*, the Supreme Court held "that despite the increasing degree of interactivity in video games, such works are considered creative expressions entitled to First Amendment protection."[110] VR content manufacturers may similarly try to insulate their content.[111]

However, under the First Amendment, the right to freedom of speech generally protects expression but does not extend to non-expressive conduct, such as driving a car.[112] Some may argue that the immersive nature of virtual reality makes it more analogous to driving a car, and therefore not expressive or protected under the First Amendment.[113] The Supreme Court case of *Spence v. Washington* established a test that draws a line for what could constitute expression in a virtual reality environment.[114] As explained by Professor Blitz, "under the "Spence test," an act such as burning a flag or walking down a street—which is neither a use of words, nor another recognized form of expression—may nonetheless count as First Amendment expression when the individual undertaking the act is using it in such a way that conveys a particularized message to an audience likely to understand that message, given the context."[115] Thus, in a virtual reality world, riding in a virtual car would not be an expressive act, while painting a virtual picture or burning a virtual flag in protest would be protected by the First Amendment.[116]

Proponents have expanded upon First Amendment protection within virtual reality by arguing that private virtual reality experiences deserve stronger

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[107] Banki & Pritchett, *supra* note 1.
[108] *Id.*
[109] *Id.*
[110] *Id.*
[111] *Id.*
[112] Marc Jonathan Blitz, *The Freedom Of 3d Thought: The First Amendment In virtual reality*, 30 CARDOZO L. REV. 1141, 1148 (2009).
[113] *Id.*
[114] *Id.* at 1149.
[115] *Id.*
[116] *Id.*

First Amendment protection, even if they are not speech or expression.[117] In *Stanley v. Georgia*, the Supreme Court held that the free speech clause protects people against government restriction of our "beliefs. . . thoughts. . . emotions and. . . sensations" in addition to speech.[118] Thus, the free speech clause protects the realm of fantasies, which is the particular realm that virtual reality offers users in entering when they put on the head mounted display.[119] Accordingly, under *Stanley v. Georgia*, private virtual reality experiences within this fantasy could be fully protected by the First Amendment.

The virtual reality experience is so unique and different from other experiences that it is still very unclear how much First Amendment protection the technology will receive. Ultimately, only time will tell if this becomes a significant issue or if conduct otherwise rejected in civilized society, such as torture and violence, will be protected within virtual reality.[120]

VI. RECOMMENDATIONS ON REGULATION

Virtual reality is still a new emerging field of technology with a variety of legal issues that may or may not materialize. As such, formal regulation is still very difficult and would not likely be very effective until the passage of time uncovers the main issues. There will always be a level of self-regulation conducted by the VR companies themselves as they create and police the use of their technology. But there remains concern that users and developers will need additional layers of protection from these companies themselves. Therefore, we must also set a framework for outside regulation to comprehensively guard the industry and protect their users.

A difficulty commonly associated with regulating an emerging technology such as virtual reality is protecting innovation. If regulation is introduced too quickly, it could stifle the natural evolution of the technology. However, if technological advancement goes unchecked, it could lead to hazardous situations and irreversible damage. In order to balance these interests for virtual reality, we must separate privacy from the other legal issues described above. Privacy concerns should be directly regulated as soon as possible to protect consumers. However, the other legal issues of intellectual property, physical and torts risks, and First Amendment rights should be addressed as they emerge. Although this would result in reactive regulation for these issues, proactive regulation might not be very accurate and could result in a chilling effect on the development of the technology.

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117 *Id.* at 1150.
118 *Id.*; Stanley v. Georgia, 394 U.S. 557, 564 (1969).
119 *Id.*
120 Banki & Pritchett, *supra* note 1.; Blitz, *supra* note 112.

A. Privacy Regulation

The privacy rights associated with virtual reality devices should be addressed as quickly as possible to protect consumer information. The personal information that users give to VR companies, in addition to the information gathered from users' actions and decisions while using the virtual reality technology, should be broadly protected. We cannot afford to wait to regulate privacy rights because the companies are already collecting user information and the damage is already occurring. Oculus's Terms of Use illustrates this danger currently. Reactive regulation would likely have little effect, as the companies would have already collected so much data that there would be no effective way to retrieve it. Furthermore, the longer we wait to regulate the privacy rights, the higher the risk that there will be a shift in our collective privacy norms and a public acceptance of a lack of privacy.

There is already an immense generational divide in online privacy perspectives. A 2013 University of Southern California study found that millennials were much more willing to release their personal data or web behavior to online businesses.[121] More than half of the millennials surveyed indicated they would trade personal information in exchange for something else.[122] Virtual reality technology is being most heavily marketed towards millennials. If privacy regulations are not established quickly, companies like Facebook might be able to collect VR data with little concern for the majority of their consumers.

There are various ways for the regulation of virtual reality privacy to begin through the public. Hopefully Senator Al Franken's letter to Oculus regarding privacy will be answered and the reply will create a public dialogue about the necessity of privacy regulation. With enough dialogue, there could be regulation that emerges from the companies themselves as a result of the social pressure to protect privacy. More likely, however, is the U.S. government stepping in to regulate user privacy. Perhaps the Federal Trade Commission (FTC) or the Federal Communications Commission (FCC) could step in to regulate virtual reality privacy. A special committee within one of these commissions could potentially set limits upon what kind of personal data can be collected and the specific ways in which it can be used. They could set enforcement guidelines and provide sanctions against VR companies that have been found in violation. Furthermore, they could aid consumers in pursuing private causes of actions in the event of data breaches and leaks. It is likely that in order to enact such broad privacy protection and impose these regulations upon VR companies, new government legislation would be needed to give the FTC or

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[121] Dan Graziano, *Study shows major generational divide on online privacy attitudes*, BGR (Apr. 25, 2013), http://bgr.com/2013/04/25/online-piracy-study-young-adults-465164/.

[122] *Id.*

FCC legitimacy and power. A special committee within these agencies would be able to operate with much more authority if the power was granted through new legislation.

Legislators should look to provide privacy protection not only in terms of virtual reality, but on the broadest scope possible. Informational privacy should be protected in the United States as an absolute value. In Western Europe, informational privacy is protected as a fundamental human right.[123] Europe illustrates that not only is it feasible to extend privacy protection, but that doing so has the potential to reduce litigation.[124] The US should follow the example of Europe and provide wider privacy rights, especially in light of the emergence of new technologies that keep facilitating further privacy violations.

By regulating virtual reality privacy rights, it is possible to not only safeguard VR consumers, but also help shift privacy norms among the new generations online as well. Regulating privacy rights will likely not stifle the innovation of virtual reality technology, as constant user data is not necessary or fundamental for the progression of the field. Therefore, there is little risk and lots of incentive for rapid regulation of virtual reality privacy rights.

B. Intellectual Property, Torts, and First Amendment Regulation

Intellectual Property, Torts and First Amendment regulation, on the other hand, should not be subject to new regulation until the passage of time reveals potential concerns that might merit regulation. The wait-and-see approach is more appropriate for these legal issues as they are yet to fully emerge, so reactive regulation will suffice. The negative ramifications of early regulation far outweigh any potential risks posed by waiting. With regard to IP, tort claims and freedom of speech rights, any overreaching regulation pose a threat to the developers, creators and manufacturers of the technology. Regulation without cause could stifle the creation of new VR technology and impact the way that users interact with the technology. In examining virtual worlds, Professor Albert Lin of UC Davis School of Law argues that "extending property, tort, or criminal protections to virtual worlds may undermine their attractiveness to users as places of intrigue, escape, and freedom. Incorporating private property protections also may infringe upon the freedom of virtual world designers, stifling the evolution of virtual worlds."[125] The impact of these forms of regulation on both VR creators and users would result in a chilling effect upon the technology and potentially hinder widespread adoption.

Tort, IP and First Amendment law is so expansive that it is unclear what novel issues will emerge in the future. While it is certain that virtual reality will

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[123] Azarchs, *supra* note 69 at 806.

[124] *Id.* at 828.

[125] Albert C. Lin, *virtual Consumption: A Second Life for Earth?*, 2008 B.Y.U.L. REV. 47, 102 (2008).

give rise to various tort claims, it currently does not present any unusual concerns that would result in cases of first impression. Any tort claims will likely fit into the established case law. Therefore, there is no need for any new regulatory tort response specific to virtual reality technology at this time.

Unlike privacy concerns, IP, tort and First Amendment challenges can be addressed retroactively and on a more case by case basis. Unless these legal issues become widespread, legal precedent should more than suffice in providing guidelines and remedies. Furthermore, the VR companies themselves will be able to self-regulate these issues to a certain extent internally through their content and terms of use. Therefore, to balance risks and promote innovation, lawmakers should refrain from regulating IP, tort, and first amendment issues until it becomes necessary.

VII. CONCLUSION

Virtual reality is positioned to become the next great technological innovation to gain mass adoption and ingrain itself in our national norms. This paper has discussed the growth of the technology and the immediate legal issues that we will face within the next five to ten years. Once we discover and address these legal issues as they emerge alongside the current VR technology, we must also look to safeguard against the future issues that might come with the mass adoption of this technology.

Just as science fiction predicted the first forms of virtual reality goggles in the 1930s, current sci-fi authors are focusing on worlds where life within virtual reality has mostly replaced real life. *Ready Player One* by Ernest Cline illustrates a world where the environment has been decimated, world governments have fallen, and people have turned completely to virtual reality to escape.[126] Although this science fiction example is quite extreme, we do not yet know the extent of virtual reality's future issues. We must guard our society from the negative ramifications of virtual reality technology through constant dialogue and careful regulation. Safeguarding our consumption without stifling future innovation is essential because the new age of virtual reality is here.

[126] ERNEST CLINE, READY PLAYER ONE (2011).