

**DATA ANALYSIS: CREATING A VIRTUAL PLATFORM TO TEST THE NGS
SHIPBOARD**
(Technical Topic)

**THE EFFECTS OF VIRTUAL REALITY ON SOCIAL NORMS AND DIFFERENT
SOCIAL ENVIRONMENTS**
(STS Topic)

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Introduction

One of the biggest problems encountered while I was working as a software engineer intern for the United States Navy was the lack of a platform to analyze data from various naval gunfire support ships. In order to thoroughly test naval gunfire ships, the Navigation and Analysis team designed a virtual platform that would allow us to record data from different virtual systems. We modeled and designed a next generation simulation (NGS) shipboard that made it possible to multicast to a virtual machine and record data from different ships. As the production of naval gunfire ships are rapidly increasing, we needed a way that we can test accuracy and different components as well as analyzing the data to ensure we can use the ships during conflicts. The problem was that since there are so many naval gunfire support ships, the navigation team are not able to test all of them simultaneously, and creating a virtual platform allows us to simulate real world experiences that may occur.

As virtual reality is expanding in the United States of America (USA), we were able to adapt similar concepts to create a virtual platform for different naval gunfire ships. Not many individuals realize the benefits of virtual reality and how it is utilized in different environments that allows for many advancements to occur. Many individuals think that there is no reason to utilize virtual reality concepts since it may not be cost effective or affects social norms (Watson, 2021). Virtual reality is used in numerous environments such as academic field, automotive industry, healthcare industry, and the retail industry in general. The School of Education States (2019) states that “not only does virtual reality provide students with immersive learning experiences, other benefits of virtual reality in education include the ability to inspire students’ creativity and spark their imaginations”. Boiko (2022) articulates augmented reality lets shoppers see the real world with the imposed digital elements, while virtual reality shopping experience

transfers them to virtual settings. Augmented Reality lets shoppers see the real world with the imposed digital elements, while virtual reality shopping experience transfers them to virtual settings opposed to virtual reality which creates an artificial environment (Gillis, 2022). In the healthcare industry “VR simulations as a way to help doctors better empathize with their patients” (VR and the Future of Healthcare, 2020). One of the ways that the automotive industry utilizes virtual reality is for vehicle prototyping. “Virtual prototyping also simplifies research and development, accelerates the design process, and reduces the number of adjustment rounds.” According to the report, “virtual reality technology can become a sales-boosting mechanism for car manufacturers and dealers” in the general retail market (“Virtual Reality (VR) in the Automotive Industry | Overview,” n.d.). As technology is improving, we are learning that we can live in different experiences in a virtual system without having to experience it in real life. Through virtual reality, we can depict and experience simulations that can be difficult to test in the real world. These advancements in technology impact the changes in society and we adapt to the norms that are created along (Wardynski, 2019). Although there are many benefits to utilizing virtual reality in different environments, there are still affects that it has on social norms that are both positive and negative. Throughout this research, I will focus on how virtual reality affects social norms and how it is utilized differently in different environments and drives us towards technical changes that we are living in.

Technical Topic

The United States Navy is a seaborne branch of the military of the United States. Their mission is to deliver ready naval forces to win conflicts and wars for the United States. I worked for the navigation team during my internship and our main objectives were where to work with the navigation and combat system of naval gunfire ships. We needed a platform for testing the

navigation and combat ranges of different naval gunfire ships to ensure that we were equipped and organized to deliver naval forces to battle in conflicts and wars. We modeled and designed a next generation shipboard that allowed us to record data from different ships. During the modeling and design stage of the project, we needed to find a way that we can record and parse information efficiently.

Having learned how to parse information through a previous internship, I taught my team different techniques of data parsing and how to implement it in the NGS shipboard. Using Python and BeautifulSoup, we were able to create data scrapers to analyze and record data for the virtualization of ships. BeautifulSoup is a Python package that allows you to parse HTML and XML documents. It generates a parse tree for parsed pages, which can be used to extract data from HTML for web scraping (Breuss, n.d.). Analyzing this data was crucial because we needed to examine real time monitoring tools for lab-based testing. Virtual reality is a computer-generated simulation that can model real-world experiences and give an immersive feel of a simulated virtual environment (Sheldon, 2022). Many industries are using virtual systems to help test different situations to record data and analyze information in order to reduce future risks (Petrenko, 2021). Another place we may see a virtual platform used is in the automotive industry. There are different use cases of VR in the automotive industry such as prototyping which is designing a model before building it and testing design requirements and developments (Terra, n.d.). VR can be utilized to test numerous things in a car such as the safety, reliability, and much more.

An automotive industry-related article published by the Ford Media Center (2020) presented the reasons they utilize VR in their auto design work and how they able to perform maintenance and make repairs efficiently. In particular, this method saves time and money,

allowing engineers to find potential issues and do a redesign without having to build the entire vehicle. This was also a reason the Navy chose to utilize virtual reality in their design of work because it would save time to model and test ships. Sulcas, (2021) published one of the most recent studies related to site parsing during my time at my previous internship. That, along with my prior experience with site parsing for Flag Media Analytics influenced my decision to utilize this technology in the Navy simulation project. We needed to find a way to take all the data and analyze it but going through it manually would take too much time. With learning concepts of data parsing and analysis, we were able utilize that technology in our project.

STS Topic

Learning the relationship with technology and society and how we can use our technological advancements to simulate another “life” or experience without even having to occur in real life shows how we can utilize virtual reality in different way in various environments. With the technological advancements and the impact, they have on human evolution, technological determinism explores the idea of how virtual reality connects between the technical and social dimensions (Du Toit & Swer, 2021). Technological determinism focuses on the societal impact of technology. The advancements of technology shapes how society changes throughout a period. Yengin (2017) articulates “the individual’s approach to the virtual reality, hence his approach to technological determinism has changed and because of its state, technological determinism became the cause of occurrence of the virtual determinism.” Prior to virtual reality, we would not be able to experience different simulations, but as technology advanced, we learned that we can simulate experiences in a virtual reality and this increased human demands towards virtual reality. This illustrates that us individuals has adopted a lifestyle that accepts virtual reality and it becoming more common.

Another argument Yengin focuses on how virtual reality has impacted techno-social life. Yengin (2017) states that “as a result of the socialization of the produced information, human, who is globalized, starts to become digitized technically as a techno-social life individual”. This highlights another framework of techno-social life and how social interactions are driven by technology. Virtual reality has the potential to advance social connections and this shows how there is a positive impact of virtual reality and social human interactions. “Social connection through new and improved technology-mediated communication has become a mainstay in an ever-changing society, and innovative extended reality technologies, such as augmented reality (AR) and virtual reality (VR), have the potential to advance social connection from face-to-face and 2D interfaces into a lively and interactive 3D virtual environment” (Lee et al., 2021). Virtual reality can be utilized to test and improve social connections, demonstrating how technology can alter social interactions.

Although it is shown that virtual reality has positive impacts on political, civic, and environmental view, studies and research shows that virtual reality influences social attitudes more than non-immersive interventions. “Experiencing the feeling of being present in VR has potential value for the communication of social and political concerns, given that these tend to be perceived as psychologically distant” (Nikolaou et al., 2022). The authors articulate their concerns that virtual reality is affecting people’s social attitudes. “The sense of embodiment will positively moderate the relation between VR intervention and attitude” (Nikolaou et al., 2022). Virtual reality has impacted our perspective of things because it eliminates us needing to create a different viewpoint of somethings by programming it into the point of view of the user. This somewhat shows that virtual reality is giving you a perspective that is different than something that you may perceive when in the real world. Despite having many benefits of virtual reality and

how it is utilized in different environments, there are also some disadvantages to virtual reality and that it takes away human and social interactions. The connections with humans and society are taken away because people isolating them self with VR. “They can become antisocial and lose basic social skills, which can then form into social anxiety and other mental health problems” (Pennington, 2021). As they are isolating themselves, they are losing connections and interactions that essentially make them lose basic skills. Lynch (2017) argues that virtual reality in school Devalues the importance of human connections and synergy in education. Although technology has evolved and has advanced the academic field greatly by allowing education to be more accessible, it has divided the connections between human interactions.

Research question and methods

To what extent does virtual reality influence individuals’ social norms and what are the effects of it being utilized in different environments? The importance of this question highlights the different social connections between humans and virtual reality. Virtual reality (VR) is seen to influence human social interactions and how the connections are driven by modern technology. This research questions also highlights the importance of virtual reality being utilized in different fields. There are number industries that implement VR concepts that drives their mission and goals. This research questions underlines the different connections between the technical and human and social dimensions of the project. Exploring different frameworks of technological and virtual determinism along with techno-social life. Analyzing these differences in the frameworks and how they connect in certain ways. This topic will be analyzed by reviewing numerous research articles and analyzing case studies that exhibit the importance of virtual reality and how it may alter one’s behavior. All the data will be collected by analyzing different perspectives of view on virtual reality and the influence it has on social norms. The

research question addresses the importance of why virtual reality should be used in different environments but also highlights the effects it has on human social interactions.

Conclusion

When you think of virtual reality, the first thing you think of is gaming and how there are different types of consoles that simulate experiences for entertainment. Many individuals are hesitant to use virtual reality since they believe it may affect an individual's behavior or their social attitude. Not realizing the benefits of it being utilized in different social environments. Although there are many studies that show the negative outcomes of individuals using virtual reality because they have become addicted to it and has devalued their social connections, they do not see realize the importance for the use it has in driving social norms. The impacts of virtual reality have placed advancements in many fields such as the academic field, automotive industry, healthcare industry, and more. This research paper is to focus on the techno-social life and virtual determinism and how virtual reality has impacted changes in our society and how we are driven by these technological changes and promote the utilization of virtual reality although there are some predicaments when considering human social interactions in society.

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