

Thesis Project Portfolio

A Systems Approach to Improving the Spectator Experience at Collegiate Football Games

(Technical Report)

The Ethics and Implementation of the National Football League's Concussion Protocol

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science

University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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Spring, 2023

Department of Systems and Information Engineering

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Sociotechnical Synthesis

Football is one of the most popular sports across the United States. A lot goes into prepping and playing the game. The National Football League (NFL) is the single most profitable sport in America, and serves as the top level of the game. College football is the highest revenue-generating sport for many schools involved with the National Collegiate Athletic Association (NCAA). The technical work and STS research will focus on collegiate level and professional level respectively.

The technical research will devise a systems approach to evaluating the process of football game day in Charlottesville. Here at the University of Virginia, there is an intensive process that occurs in order to be prepared for the event. In 2019, UVA reported a home game attendance of approximately 47,000 people. One of the main troubles of a football team is keeping attendance and ticket sales high. UVA has had a decline in attendance since COVID-19, a drop to about 25,000 per game, and the university looks to increase fan engagement within the football community. The focus of the technical work is to use a systems methodology to improve customer experience for spectators and thus creating a stronger football culture around UVA. Utilizing a three-pronged approach, the analysis focused on traffic limitation, in-game experience improvement, and an updated website design. Meetings with stakeholders in all facets of the analysis lead to informed research and understanding. Scott Stadium sits in a unique and difficult location due to being centered between UVA grounds and the Charlottesville community. This location, as well as a lack of parking options has created issues for fans traveling to Charlottesville for a football gameday. Working alongside the University Police Department (UPD) yielded observational data on the game day traffic around Scott Stadium. The UVA Athletics Department provided ticketing data that showed the ingress and egress of fans

per gate. Aramark provided concessions numbers and a survey offered information on the in-game experience from the eyes of students. Finally, there was an examination of the team's digital presence and an analysis of the website. The data provided that new signage, GPS directions and an updated traffic plan could reduce congestion around Scott Stadium. Analyzing ticketing statistics showed that late arrivals and inefficient distribution of ticket scans lead to poor kick-off attendance and bottleneck in the entrances. This creates a need for more communication about the best way to enter the stadium. The concession data revealed that concessions could be distributed more efficiently, and be more affordable. The student survey revealed that many students stay about half of the game, and that there is a need for more incentive to stay through the entire game. Finally, website evaluation led to a discovery of difficulty finding important information as a fan, and a need to be updated for simplicity.

The focus of the STS research paper is to analyze the dangers of playing football at a professional level. There is a focus on the ethics of the Concussion Protocol that the NFL updates and utilizes every season involving traumatic brain injury. The integrity of the NFL was not questioned until there was a discovery of chronic traumatic encephalopathy (CTE) in retired players. Throughout my STS research I accentuate the social and psychological factors of brain injury, and the reaction of the NFL. A key factor of the research involves Dr. Bennet Omalu and his findings of CTE, and the lengths he went to spread awareness. The STS research explores through two case studies how the league has navigated concussion injuries and the long lasting impact they can have on an individual. The first study is on the "patient-zero" of CTE research, Mike Webster. Research explained his reduced quality of life stemmed directly from injuries he faced in the league. Another, more recent study, is that of Tua Tagovailoa, and how the NFL handled his injuries. This case more so focuses on the malpractice of the NFL, and how it could

potentially lead to CTE in a retired life. These findings argue that the way the NFL has been handling these procedures is unethical in the way they have been trying to mask the damaging effects of these injuries on retired players. The results of the research were to have an increased emphasis on the needs for a higher focus on preventative measures to better the lives of the players in the league. The technical and STS studies both focus on the betterment of football, on both the attendees and players of the game.