

Thesis Project Portfolio

Combatting the Ever-Growing Societal Issue of Smartphone Addiction

(Technical Report)

Sociotechnical Systems Analysis of Combat Sports to Advocate for Action to Reduce Rapid Weight Loss

(STS Research Paper)

An Undergraduate Thesis

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Investigating Potential Solutions to Issues within Combat Sports and Smartphone Addiction

Within the world of combat sports, there has been increased attention on protecting the health of its athletes. An ongoing problem that has been highlighted involves rapid weight loss techniques that place their athlete's physical and mental health at risk. The technical portion of my thesis project involved developing a proof of concept for a browser extension to help combat smartphone addiction. My STS research focused on the sociotechnical system of combat sports, providing an evaluation of the system and attempts at solving the issues with rapid weight loss. The motivation to research this topic stems from my personal experience with combat sports, as this was a consistent problem and subject during my time competing.

The technical portion of my thesis produced a proof of concept for a Google Chrome extension designed to help deter smartphone and internet addiction. The project involved researching the rise of the issue in recent times and the proposed solutions that have been developed to curb or deter its effects. Our research found that similar attempts at solutions have proven ineffective due to the lack of incentives provided to a person for their efforts in curing their addiction, as well as many loopholes within the solutions that allow users to continue practicing patterns of addictive usage and behaviors. Our proposed extension would require a user to deposit funds at the beginning of the week that would be decremented based on the amount of time the user spent on the internet outside of allocated "productivity hours". The remaining funds at the end of each week would be rewarded back to the user, and the user would be provided analytics of their usage as well as an end-of-week survey to reflect on their data. The

design choices for the extension were focused on utilizing a combination of positive- and negative-reinforcement in order to help maintain a user's motivation to battle their addiction.

In my STS research, I examined the sociotechnical system of combat sports to better understand how rapidly induced weight loss has become an evolving issue over time. At nearly every level of competition, from high school athletes to professional athletes, there have been reports of weight loss that results in athletes reducing their weight by roughly 10-20% in order to compete at lower weight classes. I developed a map of the system to evaluate the entities and actors involved, providing an overview of the roles they have played in the growth of the issue. The system map helps highlight the weaknesses of recent attempts at solutions, which largely consist of hydration testing leading up to competition. Combat sports athletes are motivated to compete at lower weight classes in order to compete against smaller, weaker opponents. This is only exacerbated by the cultural and organizational aspects of the system, which involve a culture of athletes and trainers that have normalized the practice, and negative consequences for an athlete's inability to make weight, such as reductions in payment and prevention of participating in competition. These existing systemic issues prevent the attempted solutions from having more positive results, as hydration testing only provides organizations with the ability to catch an occurrence, rather than work on its actual prevention.

The process of performing research for my STS project and the steps involved in developing the technical portion has provided valuable experience in both academic and technical writing. The skills gained through researching the STS portion assisted in performing

in-depth research for the technical portion, as it required looking at the problem of smartphone addiction from multiple angles in order to produce a potentially viable and effective solution. In STS 4500, we emphasized the importance of correctly defining a problem prior to attempting to develop a solution. This was an important motivating factor behind both projects, as they involved researching current systems in an attempt to better define the different aspects of each problem that had potential for improvement.