Thesis Portfolio

An Interdisciplinary Approach to Sports Analytics in a University Setting

(Technical Report)

The Ethics of Sports Analytics in Track and Field

(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

Introduction

The technical report, *Sports and Performance Analytics Center*, and the STS research paper, *The Ethics of Sports Analytics in Track and Field*, both focus on sports analytics. The capstone project explores how the University of Virginia (UVA) can better implement and grow sports analytics within both academics and the athletic department. Nonetheless, there are consequences to all advancements in technology and fields of science, even sports analytics. The STS paper focuses on those consequences and how they affect professional and Olympic track and field athlete, both in their individual careers and in the sport overall.

Capstone Project (Technical Report)

Sports analytics is a growing and profitable field that started years ago, but recently emerged quickly as a driving force in sports in the last few years. However, it remains a new application in universities. The University of Virginia (UVA) wants to incorporate sport analytics: (1) to make it a leader in the sports analytics field and (2) create a closer connection between athletics and academics. Applying systems analysis, by ranking metrics throughout identified alternatives, my capstone team and I determined the best three options for how to facilitate the growth of sports analytics at UVA, including their development over the five years that the plan is implemented. The top three options: (1) a pan-university center focused on collaboration between different schools and the athletic department, (2) a center within the athletic department focused on research involving various teams and administrations, and (3) a school center within the School of Data Science that would turn into a sports analytics major. These three options will be presented to Carla Williams, the athletic director of UVA, and

President Jim Ryan, the president of UVA, at the end of the school year to obtain their buy-in to putting the best option in motion.

STS Research Paper

As the field of sports analytics grows, there will be consequences and issues that could potentially change the sport and affect the athletes requiring answers. One issue is the ethics of collecting biometric data of athletes. This issue cuts across all sports. For the STS research paper, the focus is on professional and Olympic track and field athletes. Sports analytics that focuses on biometric data is still a new and developing concept in the sport of track and field, but the athletes are interested in using sports analytics to improve their performance. Professional Athletes were interviewed for the STS Research Paper and some of these interviewed athletes have already started collecting biometric data points; such as lactic acid, heart rate, and oxygen levels. It is anticipated that as more athletes collect biometric data that cases like Caster Semenya's ban and the Russian doping scandal will grow, meaning that knowledge of an athlete's biometrics may backfire and be used against them. For Caster Semenya, the biometric data on her testosterone levels led to her being banned from international competition. Yet, the information was insufficient to know why. Her case demonstrated the need for the International Association of Athletic Federation (IAAF) and International Olympic Committee (IOC) to create a fair field for competition.

The issue of fair competition was best shown in the Russian Doping Scandal. The Russians used biometric data to cheat on drug tests for years. When the system was discovered, the IAAF and IOC had to promptly develop new testing methods. The methods developed were based on the suspicion of drug use, not solid proof. This placed athletes at risk of being punished for false drug use. From these two cases, and having talked to professional athletes, one possible

approach for this ethic question is for the IAAF and IOC to implement laws that protect the athlete. Ultimately, individual choice on involvement in biometric data collection studies, and how their data is used, should be included in such regulation.

Reflection

Both of these research projects are important together, but also, individually. Through the capstone project, the importance of collaboration between the athletic department and academics became apparent. Working together, both advance new and innovative ideas, by incorporating groups with different background knowledge. Also, sports analytics is a field that is only going to continue to grow, as it is the next step in sports evolution. The STS research paper demonstrates the effect on the individual of these new ideas, as well as showing that attempts at fixing a problem can create new problems that require their own solutions. Finally, the STS research paper enhanced the capstone project further by focusing on one specific part of the capstone project: data collection. The ethics explored in the STS research paper could affect the data collection process for the center designed in the capstone project and effect how the center approaches projects in the future.