

Port of Virginia: Optimization of Port Systems

(Technical Paper)

The Impacts of Winning in NCAA Athletics

(STS Paper)

A Thesis Prospectus Submitted to the

Faculty of the School of Engineering and Applied Science
University of Virginia • Charlottesville, Virginia

In Partial Fulfillment of the Requirements of the Degree
Bachelor of Science, School of Engineering

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Fall, 2019

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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

Introduction

The National Collegiate Athletic Association (NCAA) is one of the most powerful and profitable entertainment businesses in America, grossing over \$1.1 billion in revenue each year (NCAA 2018). The impacts of these programs are not limited to solely financial success, however. Fielding successful sports teams has been shown to result in a rise in applications, recognition and a boost to public perception for a given university. Rallying behind a good team is also proven as an effective way to unify a student body and increase reported happiness levels for students (Silverthorne 2013). In return for the value they provide to their school, student-athletes can receive compensation in the form of scholarships for tuition and other fees, and access to team gear and facilities. As universities become increasingly aware of the many ways that offering good college athletics can benefit them, there has been a corresponding rise in efforts to secure the best recruits, provide better facilities, and offer elite coaching and medical staffs. However, as more money is spent on these teams, detractors calling for the NCAA to allow student-athletes to share in this profit grow louder and continue to gain nation-wide support. This research hopes to address the true value of success in NCAA sports, both financially and socially, in hopes to allow for more informed resolutions to the problems stated above.

The Technical Research portion of this proposal summarizes a project intended to assist the Port of Virginia (PoV) in optimizing its operations and increase trade capabilities and positive impact on the economy in Virginia. The PoV is one of the most important and influential organizations in Virginia, both socially and economically. Not only does it enable national and global trade at a massive scale, but, as a publicly-owned entity, it also makes a priority to affect its surrounding communities positively through bringing businesses and job

opportunities all over the state. At this point, the PoV has not selected a specific topic for our group to research, as our team is still in the process of collaborating with officials at the Port in order to select a feasible and actionable topic to pursue.

Technical Topic

The Port of Virginia (PoV) is an economic and social force that affects the lives and occupations of hundreds of thousands across the country. In 2018, the PoV shipped and received over 1.6 million container units, establishing it as a major player in global shipping. The Port also estimates that approximately 374,000 people, or 9.4% of Virginia's workforce, has a job that is related to the port in some capacity (Port of Virginia 2019). The PoV is a publicly owned organization, resulting in its main focus being positively impacting Virginia in social and economic manners, as opposed to private organizations that prioritize profit above all else. This mentality enables the port to effect huge amounts of positive change in the surrounding communities and Virginia as a whole.

Our capstone team is working in tandem with our faculty sponsor, UVa graduate students and Port officials and staff in order to optimize operations at the Port of Virginia and continue to increase its positive social impact. Our team collaborates with port employees in order to identify the most productive and feasible research that can be accomplished. While we have discussed other research possibilities with the Port, the two concepts that our team has been exploring most recently are: the implementation of a cold-ironing system, and the possibility of partnering with a crane manufacturer in order to produce ship-to-shore cranes in America.

Cold-ironing is a technology that was first implemented by the United States Navy, with the purpose of reducing wear on ships, cutting costs on fuel, and being more environmentally conscientious. Also known as Alternative Maritime Power (AMP), or Ship-to-Shore Power

(SSP), these names refer to the concept of providing docked container ships with a land-based power source at ports, mitigating the use of engines currently necessary to resist tides and stay stationary (Siuru 2008). In order to implement this system, a transformer must be built on the dock with the appropriate connections needed to provide the ships with a power source. The ships themselves must be outfitted with compatible technology, although several major shipping companies have been producing cargo ships with these capabilities for nearly a decade (Leach 2010). Some of the possible limitations of this suggestion include the cost of this technology and the power used, as well as the relatively short time that ships dock at the Port of Virginia on average.

Another possibility that our group is exploring is the feasibility of partnering with a large crane manufacturer, such as Konecrane, a Finnish company that does business with the PoV, in order to build and operate the first facility capable of building ship-to-shore cranes in the United States. Currently, ports in America rely on European and Asian companies to supply these massive and costly pieces of equipment. Although cost of labor and materials in the US would likely be more expensive than these companies currently can offer overseas, producing these cranes in America would allow ports to use federal and state grant money to offset this cost, as these grants are only applicable to equipment made in the United States. Producing these cranes in the USA would also reduce volatility in the price that ports have to pay for this technology. Steven M. Cernak, the chairman of the American Association of Port Authorities, called the tariffs imposed at the time on imported goods from China ‘patently unfair’ in regards to how they would affect American ports’ ability to continue growing to meet growing global economic demand (Abbott, 2018). As well as considering these benefits, the PoV is also interested in this

idea because it could have a significant positive effect on the job opportunities and economy of Virginia as a whole.

STS Topic

There are more than 460,000 college athletes in the United States, participating in 24 National College Athletic Association (NCAA) sports every year (NCAA, 2019). While most seasons only last for a few months, student-athletes often spend several hours participating in practice, meetings, film study, and other mandated team activities every week day. Many Division I athletes dedicate 40 hours or more every week to their sport (O'Shaughnessy, 2011), or the equivalent of a standard full-time job. Considering the serious time commitment, and the physical and mental tolls high-level athletics can take on an individual, it is no surprise that many student-athletes do not find the time or energy to devote themselves fully to their field of study. Compounding this issue, some universities have allowed, or even created, cultures in which student-athletes are expected to put little to no effort into their academics. An excellent example of this phenomenon is the University of North Carolina, which was sanctioned and reprimanded after it was discovered that they enrolled football and basketball players in fake courses and knowingly allowed tutors to complete their athletes' assignments (Gamin & Sayers, 2014). This culture is extremely problematic considering that even a Division I athlete has only about a two percent chance to play professionally (Manfred, 2012). According to the NCAA, student-athletes are compensated through scholarships that allow them to earn an education for free or for reduced costs, as well as through room and board and some other smaller perks. However, when the education these athletes receive is as limited and sub-optimal as it is in many cases, it often results in the NCAA making huge profits off of players while having to provide little of value in return.

Several members of the national media, such as Jemele Hill, have put further pressure on the NCAA and called for changes to be made in other facets of college sports. In her article for The Athletic, Hill called for elite African American athletes who are going to play in the NCAA to consider committing to play their respective sports at Historically Black Colleges and Universities (HBCU's) as opposed to Predominately White Institutions (PWI's). She argues that the shift in athletic power structure in college sports would not only result in far more revenue received from sports for HBCU's, but would also increase these schools' national recognition and standing, allowing them to provide top-level facilities and faculty. Hill posits that this change in mentality of athletes would have massive and far-reaching impacts in African American communities, affording them far better education and more avenues to success (Hill, 2019). This is just one example of the possibilities of social impacts from college sports that this research will seek to examine.

There are hundreds of thousands of people, institutions and organizations that are affected directly and indirectly by the network of college athletics. Some of the stakeholders whose roles are relatively clear in this network include the student-athletes, the universities, and the NCAA, as well as its body of governing rules. These groups combine to provide the product, entertaining sports games, to another influential part of this web, the fans. These consumers provide revenue for the NCAA by purchasing game tickets, and team and school merchandise, and watching on TV or online, or listening to broadcasts on the radio. This massive demand provides funding for universities and the NCAA to build stadiums, practice facilities, team stores, dining halls and other physical artifacts in hopes to provide the best possible experience for fans and encourage optimal performance from student-athletes. Other groups of people

influenced by these sports include the communities the universities are located in, as well as the current student body and alumni of the school.

The STS theory most applicable to analyzing NCAA sports is Actor-Network Theory (ANT), developed by Bruno Latour, Michel Callon, and John Law (Banks, 2011). This theory revolves around the concept of a heterogeneous network made of inseparable social and technical components. It is important to note that these components, commonly referred to as actants, are viewed as equals within their webs regardless of if they are people, ideas, societal norms, or any other identifiable concept that has influence on the actions and decisions made in the networks. The result of this equality is that not only people, but technology, laws, and countless other organizations are viewed as having the possibility of effecting change within society.

Critics of ANT, such as Sandra Harding, argue that it struggles to accurately assess the impact of social factors such as gender, race, and class. David Bloor and Sal Restivo offer similar thoughts, positing that the language and analytical tools employed by Actor-Network Theory only allow scholars to describe power structure, not to challenge them (Elder-Vass, 2015). Others believe that ANT can be unable to describe explanations for social processes due to its descriptive nature, or that analysis using it can often end in a researcher identifying endless connections and networks. Considering these weaknesses, ANT lends itself best to interpretative and critical research as opposed to positivist research. A researcher using Actor-Network Theory should also be sure to establish clear limits and boundaries, in hopes to limit the identified connections and actants to a manageable amount.

Research Question and Methods:

This research seeks to analyze and assess the true value of winning NCAA games. To adequately perform this research, the question should be partitioned into its two most relevant aspects: the financial impact and the social benefits. In order to quantify the effect of college sports on a university's financials, I will perform statistical analysis to determine if the revenue produced, merchandise sold, and donations received due to these games make a significant impact on the amount of money that a given university makes. In order to understand the social impact that a successful college sports program has on a community, I will examine existing literature and anecdotal evidence on the subject. I will also employ the Actor-Network Theory to examine the networks and actants involved in this network, in hopes to further understand the entire impact of NCAA sports. Once these networks have been identified and examined, I will employ network analysis in order to describe and understand the structure of this organization and the unique relationships of its actants. This method is an appropriate one to apply to this problem, as ANT and network analysis are effective methods to use in order to describe social processes occurring in huge, heterogeneous networks such as the one resulting from NCAA sports.

Conclusion

The technical deliverable resulting from this research will likely be a recommendation for the Port of Virginia to pursue the implementation of a system that our capstone team believes will further optimize their operation. While we do not yet know the specifics of the recommendation, we do know that it will enable the Port to better accomplish its goals of being a major force in global and national trade, as well as having a positive impact on its surrounding communities and Virginia as a whole.

The STS proposal will address the true value of winning college sports games, considering both financial and social impacts. This knowledge is valuable for multiple reasons, the first of which is understanding the value that athletes are providing the universities they play for, in hopes that they may be fairly compensated for their worth. Assessing the cultural impact of these sports is also an extremely important objective of this research. Understanding this aspect of NCAA sports would provide athletes with extremely valuable context in making the decision of what university to represent, as well as possibly offering some insight towards questions such as Jemele Hill's; "... what if a group of elite athletes collectively made the choice to attend [Historically Black Colleges and Universities]?" (Hill, 2019). This research will be performed with the hope of enabling a more informed and beneficial environment surrounding the NCAA and college athletics.

References

- Hill, J. (2019). "It's Time for Black Athletes to Leave White Colleges." *The Atlantic*. Retrieved from <https://www.theatlantic.com/magazine/archive/2019/10/black-athletes-should-leave-white-colleges/596629/>
- O'Shaughnessy, L. (2011) "Do College Athletes Have Time to Be Students?" *CBSNews*. Retrieved from <https://www.cbsnews.com/news/do-college-athletes-have-time-to-be-students/>
- (2018). "NCAA Finances." *USA Today Sports*. Retrieved from <http://sports.usatoday.com/ncaa/finances/>
- Southall et al., "Athletic Success and NCAA Profit-Athletes' Adjusted Graduation Gaps." *Sociology of Sport Journal*. Retrieved from <http://proxy01.its.virginia.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=113169506&site=ehost-live&scope=site>
- Silverthorne, S. (2013). "The Flutie Effect." *HBS Working Knowledge*. Retrieved from <https://www.forbes.com/sites/hbsworkingknowledge/2013/04/29/the-flutie-effect-how-athletic-success-boosts-college-applications/#1b93e80d6e96>
- Chung, D. (2015). "How much is a win worth?" *Harvard Business School*. Retrieved from https://www.hbs.edu/faculty/Publication%20Files/How%20much%20is%20a%20win%20worth_MgtSci_Final_2015_0812_5d8e67f6-cf0e-428f-bb03-7c292ecd6049.pdf
- Lindo, Swensen, and Waddell, (2011). "Are Big-Time Sports a Threat to Student Achievement?" *National Bureau of Economic Research*. Retrieved from <https://www.nber.org/papers/w17677.pdf>
- Zook and Holm, (2016). "Does Starting New Football Programs Help Universities?" *Scholars Strategy Network*. Retrieved from <https://scholars.org/contribution/does-starting-new-football-programs-help-universities>
- NCAA, (2019). "Student-Athletes". Retrieved from <http://www.ncaa.org/student-athletes>
- Gamin, S. & Sayers, D., (2014). *CNN* "UNC Athletics Report Finds 18 Years of Academic Fraud - CNN." Retrieved from <https://www.cnn.com/2014/10/22/us/unc-report-academic-fraud/index.html>

- Manfred, T., (2012). *Business Insider*. “NCAA: Percentage Of College Athletes In Football, Basketball, Baseball Who Go Pro - Business Insider.” Retrieved from <https://www.businessinsider.com/odds-college-athletes-become-professionals-2012-2>
- Banks, D. (2011). *Cyberology*. “A Brief Summary of Actor Network Theory.” Retrieved from <https://thesocietypages.org/cyborgology/2011/12/02/a-brief-summary-of-actor-network-theory/>
- Elder-Vass, D. (2015). *Loughborough University*. “Disassembling Actor-Network Theory.” Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.1029.5018&rep=rep1&type=pdf>
- The Port of Virginia*. (2019). “The Port of Virginia - Fast Facts.” Retrieved from <http://www.portofvirginia.com/stewardship/economic-development/fast-facts/>
- The Port of Virginia*. (2019). “The Port of Virginia - Port Stats.” Retrieved from <http://www.portofvirginia.com/about/port-stats/>
- Abbott, P. S., (2018). *AJOT* “‘Patently Unfair’ Tariffs Imperiling U.S. Port Infrastructure Advances.” Retrieved from <https://ajot.com/insights/full/ai-patently-unfair-tariffs-imperiling-u.s.-port-infrastructure-advances>
- Leach, P., (2010). *Maritime News*. “APL Retrofits Five Ships for Cold Ironing.” Retrieved from https://www.joc.com/maritime-news/apl-retrofits-five-ships-cold-ironing_20100726.html
- Siuru, B., (2008). *Professional Mariner*. “Cold Ironing: An Approach to Ships Power Whose Time Has Come.” Retrieved from <http://www.professionalmariner.com/April-2008/Cold-ironing-An-approach-to-ship-226-128-153s-power-whose-time-has-come/>