

## **Thesis Project Portfolio**

### **Investigation into Polyhydroxybutyrate and Bacterial Nanocellulose Composites as Replacements for Single- Use Paper Packaging** (Technical Report)

### **The Dichotomy of Money and Social Impact in Corporate America**

(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, 2021

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## **Sociotechnical Synthesis**

We only have one Earth, so we need to take care of it, and this means environmentally and socially. Corporations are an ever-growing power in our society that play a huge role in environmental and social impact, but the unfortunate reality is that for a long time these companies were harming anything that didn't make them money. This prompted the question of what is causing and how do we change the trajectory that we are currently on as a society? The following explores two directions to the questions of what is currently happening and how can we drive change within our society.

My STS research sets out to explore the broader question of what is currently happening within our society in regards to corporate impact. Initially exploring the different styles of corporations, the positive and negative impacts associated with them, and then moving more towards what groups hold the power to influence corporate action and some of the major shifts in typical corporate thinking. From this research I discovered a few trends. First, money is far and away the driving factor in most corporate decisions even if the company is a nonprofit. Companies need money to survive and also make shareholders happy, so they will go to great lengths to generate revenue. Because of this, money is also one of the strongest points of influencing corporate actions. Bodies like the government can create incentives or regulations to make companies act in a certain manor, individuals and workers can boycott certain shops or start social movements

that can attract companies' attention through lost revenue, and lastly institutional investors can provide more or less money to really influence long term changes within companies as they are typically some of the largest shareholders.

The technical project took a slightly different approach to influencing change in corporate impact. We set out to develop a holistically sustainable packaging alternative to existing plastic solutions that are harming our environment. This starting with the thesis that if consumers are demonstrating interest in more sustainable packaging and we can develop a more sustainable option, within a margin of the cost of existing packing, that we can essentially force adoption of a more sustainable packing solution. From this project we discovered that there is a significant amount of money being invested by companies and institutional investors into this area of greener packaging and would likely find adopters within emerging markets such as cannabis where the average consumer is aligned with the goal of reducing negative impact on our society.

My capstone group was successful in developing an initial prototype that utilized Polyhydroxybutyrate and Bacterial Nanocellulose Composites and could serve as an alternative to existing packaging option gives the necessary infrastructure and equipment to further develop our prototype into a market ready product.

I would like to thank professors Sean Ferguson, James Groves, James Fitz-Gerald, Chip Blankenship, and Jerry Floro in addition to Mike Hawboldt and Gayle Schueller for their immense contributions to our learning and this project as a whole. I would also like to thank my capstone group for their tremendous effort into this project, without whom none of this would have been possible.