

**Thesis Project Portfolio**

**Design of a Non-Alcoholic Beer and Hard Kombucha Manufacturing Process**

(Technical Report)

**Analyzing the Technologies that Reinforce Systems of Social Inequality in American  
Brewing Companies**

(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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## **Sociotechnical Synthesis**

Throughout my thesis, there are themes of recognizing, analyzing, and capitalizing on changes in the American brewing industry. The motivation behind my STS research is to analyze the brewing industry's past to determine its present state and the possible steps for them to take in the future. For my technical capstone, my team and I take advantage of favorable market trends to design a novel process that holds a significant amount of future value.

In my STS research, I identify and investigate the technologies in place that reinforce social inequality in the American brewing industry. I primarily use the STS theory of technological politics developed by Langdon Winner to come to my conclusions. Winner's theory, which basically argues that technologies have real social implications on the people that engage with them, perfectly aligns with the aims of this paper. Although many advancements have been made in the brewing industry to become more diverse in gender, race, and class, there are still noticeable barriers that have the possibility of being removed to continue making those advancements. A unique aspect of this study is analyzing the differences between local craft breweries and large-scale national brewing companies. Determining the extent in which these differences have an impact, combined with the theory of technological politics, allows for a complex and intersectional analysis to take place. By using literature review spanning several decades, this study determines how certain existing technologies reinforce social inequality in regard to sexism, racism, and classism, and to what extent. It also determines how the effects of technological politics change as a company expands its operations. This paper argues that the importance of identifying these technologies has real social and economic implications. Studies have repeatedly shown that increasing diversity not only makes workers feel more comfortable and satisfied with their jobs, but also economically benefits the company.

The technical portion of my thesis focuses on new products and processes. By combining the production of non-alcoholic beer and hard kombucha, my capstone team and I are stepping into markets that are growing rapidly and putting ourselves at the technological forefront of the industry. Our key point in our process is our alcohol transportation method; we use reverse osmosis to remove an ethanol and water mixture from the beer, then distill the mixture to send a higher concentration of ethanol into our kombucha. The processes of removing ethanol from beer and adding ethanol to kombucha are not new, however we are the first ones to combine the processes under one roof.