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

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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.

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Introduction

Just like every other industry in the United States, there are systems ingrained in the brewing industry that reinforce social inequalities. Although heartfelt efforts are being made to turn the industry into a more equitable place for people of all identities, it is a process that will take years full of deliberate changes. In fact, there is already discourse surrounding recent changes in the brewing industry that had initially hopeful results but have in a way backfired due to certain cultural logics.

A cultural logic describes the process of people using stereotypes and other precedents to hypothesize other's motivations and intentions (Enfield, 2000). A recent study focuses on the cultural logic coined as "pure passion", which refers to the increasingly common idea of finding a passion for work, which is used both by workers making career choices and employers making hiring decisions. Initially, this was seen as the ideal cultural logic, rendering useless any consideration based on gender, race, and class, while prioritizing inner drive and merit. In practice, however, cultural logics like pure passion were found to "reinforce the dominant position of white, middle-class men in [the brewing] industry while simultaneously marginalizing the experiences of women and people of color" (Wilson, 2022). This realization is impelling; clearly one of the primary ways of thinking in the brewing industry that was meant to create an even playing field is not actually doing so. Therefore, I dedicate this research project to identifying the systems in place that – if they were to change – would truly lead to an industry that is more welcoming and fairer to people of all backgrounds.

Theory of Technological Politics

In Langdon Winner's paper "Do artifacts have politics?" written in 1980, he argues that there are two ways that artifacts have politics. He refers to artifacts as the material things that we

engage with every day, and defines politics here as the social arrangements of power and authority, and the interactions that occur withing those arrangements (Winner, 1980). For this paper, I equate artifacts to the physical technologies that exist in the brewing industry.

The first of two ways that artifacts have politics is when the invention, design, or technology is created or used to solve a problem by a specific community for a specific community. Winner uses the development of the tomato harvester as an example. Designers at the University of California system created an incredibly efficient tomato harvester that automated the entire hand picking process. However, this machine had a tremendous size and cost, putting farmers at a disadvantage if they did not have the required capital and farm size. This led to a severe drop in the number of Californian tomato farmers, despite tomato production increasing substantially. Additionally, the aggressive automation forced researchers to breed varieties of tomatoes that prioritized sturdiness at the cost of taste. These two consequences reveal the community that the University of California researchers were aiming to help; the large-scale industrial farmers. By helping a certain community, other communities were also affected, in this case negatively.

The second way is seen in cases he refers to as “inherently political technologies”, this definition has many more subsets, but generally he is referring to the impact of technologies that can exist outside of their design process. These technologies have the seemingly inevitable power to bring about new relations between groups of people, or even new groups entirely. In his paper, he cites an example: by accepting the use of nuclear power plants, you also accept a “techno-scientific-industrial-military elite.” To efficiently run such a complex and high-risk system, there must be a specialized select few to lead, thereby creating an imbalance of power that likely has staggering political and economic ramifications.

This idea that technologies not only are created from structures of power but have the ability to reinforce them is an important light that I use to guide my research for this project. I cannot let any technology go unnoticed, no matter how mundane or unimposing it may seem. I found Winner's theory of technologies having politics to be relevant to the research I wanted to conduct in the STS portion of my project, which seeks to identify the technologies that reinforce systems of inequality.

I find both ways of artifacts having politics to be relevant in this portion of research. The first classification, which focuses on the target problems and communities, helps me determine who actually benefits from the technologies being used. Is it the consumer at the end of the process, the operator who uses the technologies on a daily basis, or the management that prioritizes production quotas and economics over everything else? The second classification of inherently political technologies leads me to ask many more loaded questions. By creating both software and hardware used in breweries, what political implications are brought into the space? What qualifications are needed to use these technologies? Do these qualifications come from on-the-job training, or are they expected to have some certification, or maybe an engineering degree, to even be considered for a job here? From the implementation of certain technologies, do we see new relations being created or affected?

Research Question and Methods

To effectively apply the theory of technological politics onto the technological systems in the brewing industry, I have devised a research question that allows me to analyze brewing companies through a lens of socio-technological change and expansion: to what extent do technologies in American brewing companies reinforce systems of social inequality as they expand their operations?

The research method that I use is literature review. This literature review spans multiple media, including research papers, articles, and recorded interviews regarding the prevalent technologies across the brewing industry. I will also look through the requirements that are listed in the hiring websites of both local and national brewing companies.

In this project, I focus on many companies spanning the range of operation size. For smaller, local brewers, I looked at Three Notch'd Brewing Company, Devil's Backbone Brewing Company, and Starr Hill Brewery, all based in Virginia. For larger, national brewers, I looked at Molson Coors, Anheuser-Busch, and Constellation Brands (Corona, Modelo beers).

History of the Large Brewing Companies

When discussing the differences between two categories so monumentally different in scale, it is crucial to understand the environments that the more established breweries started and succeeded in. For reference, none of the local brewing companies are more than 25 years old; in contrast, none of the larger brands in this paper are younger than 79 years old, with Molson (part of Molson Coors) being the oldest at 238 years old (Molson Coors, n.d.).

Not only are these companies well-established, but they are also revolutionary; Anheuser-Busch especially made many important technological developments in its time. It was the first American brewer to use pasteurization to keep beer fresh and was also the first to use mechanical refrigeration and refrigerated railroad cars. (Anheuser-Busch, n.d.).

Although these well-established companies have helped push technological progress in a multitude of ways, they are not without their very harmful downfalls. There is a notable difference in the barrier for entry between straight white men and basically every other demographic; the difference in the barrier for acceptance is even greater. In the 1960s and 1970s,

Coors Brewing Company—now part of Molson Coors—used polygraph testing to allegedly discriminate against LGBTQ+ individuals (Hsiao, 1998).

In 1970, Coors was also found guilty by the Colorado Civil Rights Commission of racial discrimination for firing a worker because of his race (Cole & Brantley, 2014). Additionally, multiple claims were filed by the Equal Employment Opportunity Commission alleging that African Americans and Mexican Americans were only allowed to work at Coors in menial labor and clerical positions (El Despertador, 1976). Along with these serious claims, African Americans, Mexican Americans, and queer people started a joint boycott against Coors in their flagship plant's town of Golden, Colorado (Gold, 1999). This boycott has lasted so long in places that, commented by renowned LGBT activist Nancy Wohlforth, no gay bars supply Coors in San Francisco, even 50 years later (Kelly, 2019).

Two notable time periods that contributed to the low numbers of women in the industry are the Industrial Revolution and the Temperance movement. As the United States started to industrialize in the late 18th century, a distinct gender divide expected the men to work in the factories and brewing plants while women were forced to focus on things like family and home care (Stanfors & Goldscheider, 2017). The Temperance movement, also known as the "Women's Crusade," created a strong link between women and alcohol prohibition during the late 19th and early 20th centuries (Knight, 1976). These two movements both contributed to stigmas surrounding women in the workplace and women associating with beer and can explain the low female worker percentages that are still noticeably low to this day. The social history of the brewing industry and the entire United States illustrates how difficult it was to succeed as a gender, racial, and/or sexual minority, and these difficulties are nowhere near gone.

From a sociotechnical aspect, another significant difference in the barrier for entry was a degree requirement. In the 1700's and 1800's, it was not required at all to get a degree; however, wealth was still a major factor in founding and maintaining a brewery. Eberhard Anheuser, one of the co-founders of Anheuser-Busch, was born into a wealthy family in Germany and was himself a successful businessman (Barnett, n.d.). Adolphus Busch, co-founder of Anheuser-Busch, was born into a wealthy family in present-day Germany, and actually graduated from a collegiate institute in Brussels. (New York Times, 1913).

In the 21st century, experience is important, but it is encouraged to have a relevant degree in the brewing industry. In a sample size of 397, a survey found a positive correlation between getting a degree and having a higher salary, regardless of position in the brewery (McClellan, 2018). By applying the second classification of technological politics to the degree in the environment of the brewing industry workforce, a degree's inherent politics are revealed. By pushing the cultural logics mentioned in the introduction and creating a sense of meritocracy around the earning of a degree, even though there are still many real social and economic barriers. It comes off as fair, while simultaneously diminishing the struggles of people who can't afford to get a degree, in turn reinforcing the systems of inequality that exist in the brewing industry. In the United States, white men have had a very strong grasp on the leadership in the brewing industry, and there are still lingering effects of the racism and sexism imposed on American society.

Analysis

The first aspect that is analyzed is the requirements for entry level positions in the engineering and brewer operation realms. By applying the first classification of technological politics, we find that the "problem" in this situation is who will produce the beer, and who will

improve the production process. The specific community solving the problem are the current employees; HR personnel guided by the needs of senior plant managers and engineers at the larger companies, and the equivalents for the smaller brewers. The specific community that the problem is being solved for is actually the same people; the consumers of the beer may be the community for the product, but the senior plant managers and engineers are the people whose jobs and reputations are at stake when they are hiring entry level operators and engineers.

When looking at the requirements for entry level operators, there was a relative uniformity across the board. The academic requirements asked only for a high school diploma or GED. Notably, Constellation requires a PIT (powered industrial truck) certificate or equivalent experience, and PIT certificate holders are overwhelmingly male (Workday, 2024; Zippia, 2021a). Although there is not a clear and direct causal relationship, this statistic contributes to the second classification of technological politics. The forklift, along with other heavy machinery, carries a socially inherent politics to it, affecting relations between groups of people. In this case, there has been a long-standing and deep-rooted social expectation that men "should" be the ones working with forklifts and other heavy machinery, reinforcing gender stereotypes (Ginige et al., 2007).

Aside from the PIT certificate requirement, there was no significant difference in the requirements for entry level positions in engineering and brewing operations for all the companies in this study. Therefore, I conclude that the hiring requirements are not subject to change depending on the size of a company's operations. Additionally, I note that men make up a majority of people in this aspect of the workplace due to existing and powerful social forces that may prevent more women from joining this sector of the workforce. These social forces at play have also helped perpetuate this very drastic gender imbalance (Ginige et al.).

The second aspect in this analysis is the brewing industry's adoption of computing concepts like artificial intelligence (AI) and the Internet of Things (IoT). These concepts are applied to the brewing industry in various ways: companies like IntelligentX are creating beer recipes and producing them based off data that is collected from beer drinkers and run through AI algorithms. Breweries have been gradually implementing IoT technologies into their production process, such as RDIF tagging, programmable logic controllers, and sensors that help automate beer production (Rawat, n.d.).

Applying the first classification of technological politics to this wave of new technologies in the brewing industry reveals the problem and communities involved. The problem, as with the hiring requirements, is to improve both the product and the production process. The community solving the problem is researchers and computer scientists with specialties in artificial intelligence. The target community is once again not actually the consumers, but rather the people who lead the company or have stakes in the company's success. Although companies like IntelligentX attempt to market the user experience as the center of the company's operations, they are still limited by the capabilities of their processes and the need to make a sufficient profit.

When applying the second classification, a hidden obstacle comes to light. Most people who work in software engineering have at least a bachelor's degree (Zippia, 2021b). Additionally, the majority of data scientists earned a master's degree or PhD (365 Data Science, 2024). Regardless of whether or not the degree is "worth it" in the end, its presence holds weight; to get into these subfields of the brewing industry, a bachelor's degree is required. This field of work that has genuine promise in the brewing industry has features built in its structure that tremendously limits the worker population, especially limiting those that do not have a sufficiently high financial capability to earn a bachelor's degree. These limitations in turn have a

reinforcing effect on the industry's social hierarchy. By placing the new high-paying jobs behind a degree barrier, it only continues to be that degrees are the primary way for people to get high-paying jobs in the brewing industry.

Discussion

Through the analysis of multiple technologies and artifacts and the politics that they carry with them, I have determined that the college degree acts as one of the largest contributors to the reinforcement of social inequalities in the American brewing industry. By combining the lens of technological politics with the histories of the companies, I pinpointed how power and wealth has traveled through time in this country. In past centuries, wealthy people did not really need to earn a degree to keep making wealth. These days, however, the path that wealth takes to proliferate goes through the higher education system. And in this country where white men have always been the ones in power, it is not farfetched to say the same applies to the brewing industry. In fact, in 2021, about 93% of brewery owners identify as White; additionally, 75% of brewery owners identify as a man (Watson, 2021). It is not just brewery owners that are mostly white and mostly male; similar trends can be seen in software engineers and data scientists (Zippia, 2021c; Kinsta, n.d.).

This corroborates the fact that white people and men have multiple systems that encourage and allow them to earn degrees more successfully than their gender and racial counterparts, which has been the case throughout all of the United States' history (Bonilla-Silva & Peoples, 2022). In this era where technological advancements largely center around computers, the story is no different.

A survey led by Joseph Roy of the American Society for Engineering Education tracked all American institutions that awarded engineering degrees from 2009 to 2018. In 2018, the

researchers found that 78% of all bachelor's degrees in engineering were earned by white people, and that 62% of all bachelor's degrees in engineering were earned by men (Roy, 2019). Since 2009, these percentages have mostly stayed the same. This stagnation is especially concerning since, according to the National Center for Education Statistics, overall STEM degrees earned have been increasing steadily across the nation, from 254,000 bachelor's degrees awarded in 2009-2010 to 413,000 in 2018-2019. Although there is a discrepancy in the absolute number of degrees awarded between the two sources – due to the NCES's more broad data set accounting for more than just engineering degrees – the gender and racial breakdown are actually relatively similar throughout the 10 years that are studied, and in turn contribute to the same story. These technologies that have become ingrained in our society have politics inherent to them, and the reach of these politics extend to and are strengthened by the centuries-old American higher education system, which in turn impacts the American brewing industry.

It was surprising but comforting to see a uniformity in hiring requirements across both all companies hiring entry level engineers and operators. However, this is only on paper; the requirements and expectations on the website may differ from what hiring managers actually expect. And of course, there is an aspect of personality that may change how interviews go. The most notable part is the PIT certificate and the overwhelming male percentage of earners. Rather than being a root problem that must be fixed, it acts more as a symptom that seemingly points to larger social forces regarding gender stereotypes and performances.

Although there may be industries that are not so welcoming to women, the craft brewing industry has been a relatively open environment that has pushed for acceptance for all, including women, and especially those in STEM. This is relatively in line with the demographic statistics brought up earlier from the Brewers Association and shows the progress that has been made

since the first women started their own breweries. However, this does raise a question about the efforts for equality on race and ethnicity; revisiting Wilson's research from the introduction offers a helpful glimpse into the more purely sociological aspect of this question.

Citing Wilson's research about pure passion in the American craft brewing industry, the increasingly popular cultural logics in the brewing industry actually go against its purported steps towards a more diverse and equitable industry, and instead reinforce existing systems of social inequality. Especially in the craft brewing industry, this movement advocating for a passion-driven industry is not creating a fundamental change in the industry that would lead to a more robust and long lasting system that promotes diversity and equity.

White men were much more likely to describe their job as a genuine passion in their lives, while women and people of color were hardly ever as enthusiastic about their role in the industry. Wilson noted that white men were the most likely to make extra brewing-related commitments outside of work. This is exactly the attitude that is praised and idealized in the craft brewing industry, even leading to the point of social exclusion for those who do not fit – or at least try to fit – the ideal attitude. In addition to social exclusion, when white men in power want to hire and promote people who are extraordinarily passionate, and white men are more likely to be that passionate, then white men are therefore more likely to get hired and promoted. A cultural logic that was meant to remove race and gender inequality from the equation, in practice, only perpetuated the pre-existing systems, but now shifts the power more onto a white man-centric camaraderie. This sociological research is helpful to mine because it mirrors what we see within the higher education system. White men have several social systems that work in their favor and allow – or even encourage – them to get coveted degrees in fields such as computer science and data science.

Conclusion

This research project identified the technologies that reinforce systems of inequality and to what extent they do so. There are a couple possible things that breweries can do to change their ways to be more welcoming to all. One way to increase diversity is to host local events open to the community; giving people a place to be themselves and have fun, potentially allowing for stronger ties to the community and opening up the possibility for more people in general to learn about the brewery. Another way to increase diversity is to recruit at local community colleges. By creating strong bonds with departments at community colleges, breweries have the chance to create connections with a diverse population that has a strong personal drive but may be too economically hindered to attend universities that have been proven to reinforce social inequalities (Mijs, 2023). In other words, only recruiting at universities is likely to continue this reinforcement of social inequality. Therefore, brewing companies must start to look in places where both passion thrives and financial burdens are not as divisive.

Removing a degree requirement may not solve any problems; it may lead to a situation similar to the pure passion cultural logic mentioned in the introduction. By becoming more holistic, they focus on attributes and experiences that are more easily available to people with more wealth or power. Most of the changes that need to be done to have a lasting effect on the industry are actually on the large scale. Changing the perception of what women and men can and cannot do would be the most impactful; it would also be the most difficult. Although the degree has been shown to reinforce social inequality in a variety of ways, many of the requirements are not really found to be significantly reinforcing systems of social inequality, and it is not possible for the college degree to be the sole factor in the social inequalities in the

brewing industry. This means that there is another force at play; a glimpse of this is seen in the research done by Wilson.

To create a comprehensive understanding of the technologies and policies that significantly reinforce systems of social inequality, it would be worth looking into more purely social aspects of the brewing industry. It would be especially fruitful to investigate the HR policies of companies; this would most effectively be done through interviews with hiring managers and people in the HR departments of the companies I focused on in this study. Additionally, a deeper understanding of the public perception of the brewing industry with a lens specific to gender and sexuality would likely lead to more conclusive findings on the brewing industry.

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