Thesis Project Portfolio

Software Engineering: A Generic and Scalable Data Reconciliation Pipeline

(Technical Report)

Moral Arguments on Engineers' Actions when Designing Social Media for Addiction

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science

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Bachelor of Science, School of Engineering

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Sociotechnical Synthesis

(Executive Summary)

The Intersection of Technology and Engineering Ethics in Social Media Companies

"Addicting users to social media is impermissible because it unjustifiably harms users in a way that is both demeaning and objectionably exploitative… The attention-economy business model of social media companies strongly incentivizes them to perpetrate this wrongdoing."

- Vikram R. Bhargava and Manuel Velasquez, Ethics of the Attention Economy: The Problem of Social Media Addiction

Social media companies are businesses built on top of technology. There is inherently a drive for the company to earn money in order to make a profit. In order to make a profit and be able to pay their workers, these technology companies need to have workers who work efficiently and have a strong user base. This way, they minimize their costs and maximize their revenue, making as much of a profit as they can. For my technical project, I built a pipeline to improve worker efficiency. This pipeline was built for a big technology social media company which inspired my STS Research Paper. I knew that social media addiction is a problem, especially for children and teenagers, and wanted to investigate the ethics behind running a business in the attention-economy, where the user's attention is the product.

My technical project was a conceptual idea and implementation of an automatic and generic pipeline that reconciles data discrepancies for a big social media company. The benefits would be immediate for the team that the pipeline was implemented for because before the pipeline, different projects would need to be verified manually. However, after adoption of the pipeline, weekly manual checks and reconciliation would no longer be necessary. Additionally,

this pipeline was designed to be scalable so new projects could be onboarded and used with the pipeline.

My STS Research Paper investigates the extent to which virtue ethics as a system and the effect of understanding the effects and harms of social media impacts engineer's behaviors, focusing on the implications engineer's behaviors have on social media users' mental health. My research shows that due to the competitive nature of social media business, awareness of moral issues of certain practices have no effect on actions in the industry and business incentives will ultimately win over. These business incentives are imposed upon the engineers by the higher-ups which in turn feel pressure from the executives. These executives are very business-minded and money-oriented because they are running a company and have workers to pay.

The pipeline in my technical project was built for the specific subset of businesses that I scrutinized in my STS Research Paper, big technology companies in the social media industry. The knowledge that I gained from this experience influenced my STS research because I knew first-hand how the management structure at a big technology firm works. I learned that the three main actors that I identified in my STS Research Paper and how they interact with each other do have weight and influence engineer's decision making. Additionally, I noticed that the added layer that the engineer (singular) is only one individual in a big corporation can really be felt.

My project as a whole demonstrates that STS perspectives, in this case knowledge of ethical implications of your work, is important in supporting ethical responsibility in engineering, but is not all. Due to bureaucracy in large social media technology companies, knowledge by itself is not enough because of the business incentives. Speaking from experience, it is easy to feel like a small fish in a small pond with the amount of people in a large company. However, this can also be beneficial because of the strength in numbers (of engineers). There are

a lot of code reviews and all the engineers take pride in their work. Other fellow engineers will scrutinize the code written and it does not easily get put into production. It takes many iterations for it to go through. If many engineers recognize the harm in something and band together, they may be able to make a change in the system and prevent harm such as damage to users' mental health.