Thesis Project Portfolio

UniMap: Using Python's Django Framework to Identify On-Campus Traffic

(Technical Report)

Exploring the Reluctance of Adopting New Technologies and How that Impacts the Food Waste Issue Using Actor Network Theory

(STS Research Paper)

An Undergraduate Thesis

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Executive Summary

Introduction:

My STS research investigates the impact executives not adopting new technology in their businesses plays on the issue of food waste. My technical capstone report on an application I built that helped students across UVA know how busy certain locations are across grounds in real time on a scale of one to five. These projects relate to each other because they both involve finding ways to leverage technology to notify seemingly unrelated actors in a large network about information that is pertinent to them. In the capstone project, this involves letting random people know how busy places like a gym or library are at the current moment. In the STS research paper, it involves understanding how much stock there is in a food supply chain network and finding ways to distribute the excess food to nonprofits in a timely manner, before the food goes bad.

Summary of Capstone Project:

I built an application to help UVA students know how busy different places across grounds are including gyms, libraries, and restaurants. This application is called UniMap. Once logged in, users can click a location on the map designated by a pin and rate how busy the location is on a scale of 1 to 5, where 5 means it is extremely busy and 1 means not very busy. If a location is not on a map, users can add a pin to create a new place and it will be accessible to all users once the site admins approve it. UniMap was built using Python and its Django framework, JavaScript, HTML/CSS, the Google Authentication API, and the Google Maps API.

Summary of STS Research Paper:

Technology evolves at a rapid rate, often too fast for many companies to adapt them to enhance their business without disrupting their long-term business practices. This STS research focuses on understanding how companies approach technological change and finding its intersection as it relates to the food waste issue. The research question being examined is how the reluctance of stakeholders

involved the food industry to adopt new technology, such as Artificial Intelligence, exacerbates food waste. Using Actor Network Theory, the research paper maps the interactions between various human and nonhuman actors in the sociotechnical system including grocers, nonprofit organizations, and the technologies they use. Additionally, Downey's Problem Definition and Solution Process is used to help bridge the gaps in the system that contribute to entities wasting food by providing a strong method of examining potential solutions. The research expects to find that the reluctance to adopt modern technology is due to concerns about data privacy, a lack of understanding of the new technology, and the financial consequences for the organizations. This reluctance contributes to overproduction and inefficient distribution of food, which significantly contributes to its waste. The research in this paper is important STS because it helps organizations understand the root cause of an important sustainability issue. By understanding the interactions various unique actors and promoting effective communication and technical literacy, the study provides insights for creating more efficient food distribution systems that minimize waste.

Concluding Reflection:

The value of working on both projects is because they helped instill a mindset of engineering for impact. The STS research paper allowed me to dive into a niche use cases of understanding the mindset behind leaders who decide to use and implement new technology changes and relate that understanding to current global issues such as food waste. The technical project allowed me to build a project that directly helps people solve a common problem: not knowing how busy places were across UVA. Doing the relatively simultaneously was very valuable and rewarding because it served to reinforce methods of building projects to help people as well as providing a strong technical background when doing my research. Working on the research paper helped my technical project by keeping concepts like Actor Network Theory in mind to help understand how the new technology keeps people connected and solves their problems. Furthermore, it helped with building the project when studying the Problem Definition and Solution process because it helped me construct and optimal plan to build my software solution.

Working on my technical project helped me understand using lots of technical frameworks especially as it relates to building projects from the ground up. It translated to my research project because it played a role in understanding the actual difficulty of implementing new technology and why many businesses are indeed reluctant to do so. By doing both projects together, it allowed me to understand the human side of building technology and the technical side to business relationships.