

Sociotechnical Thesis

Today, technology is everywhere, impacting our social interactions and shaping our economy. Countless new apps emerge daily with many becoming indispensable tools for navigating everyday tasks. Consider the reliance on Google Maps for navigation or online banking for financial transactions, both applications which replaced their traditional counterparts. This reliance on apps and technology does pose one significant challenge: the need to own a phone or computer. People without the tools of technology lack the ability to integrate with society and are severely disadvantaged because of how ingrained these devices are within our culture. Consequently, as more people own electronic devices, electronic waste also rapidly increases, becoming one of the world's fastest growing streams of waste, highlighting the drawbacks of our tech-centric society.

The motivation behind my technical research revolves around the idea of using technology to create a safer and more convenient experience for users. Thus came the idea for ParkMe, a smart parking application to assist in finding parking spaces, particularly in cities. Research has shown that distracted driving is the leading cause of car accidents and finding a parking spot is one of those main distractions every driver must deal with eventually. This issue is exacerbated within cities, where there is increased pedestrian traffic and road distractions. The current prototype of ParkMe involves two circuit boards communicating through WiFi. When a user parks their car, they must press a button on the circuit board to switch their parking status. Conversely, when they leave that parking spot, the button must be pressed to switch their parking status. This button press communicates with the server, updating the list of available parking spots. When another user enters and is looking for places to park, they can select from the list of available spots and reserve it while they navigate there. Taking motivation from similar applications such as ParkMobile, I wanted to create an application that removed the distractions and stress involved in parking and hoped to increase driving safety as a result.

Understanding that ParkMe is yet another application which would increase our dependence on technology, I aimed to research electronic waste for my STS research project. In my research, I examined how different countries employed different strategies to handle e-waste and analyzed their effectiveness. Three main e-waste disposal methods were recognized.

The first method, specifically popular in the United States, was landfilling. Without proper e-waste management systems, the United States tends to dispose of their e-waste with other streams of waste, exacerbating the landfill issue and contaminating local environments further. The second method was establishing Producer Responsible Organizations (PRO), which made one or more organizations responsible for the end-of-life processes of technology. PRO's are often the company who manufactured the product but on occasion, the government steps in as the responsible figure. Lastly, when nothing is done about e-waste, many citizens take it upon themselves to solve the issue, spawning the informal sector for e-waste. This informal sector consists of locally owned second-hand markets, refurbishing shops, part stores, etc. This practice is largely popular in Asian countries however, without proper training or knowledge into e-waste, poisonous residue is leftover and polluting the local environment and residents.

In the future, I recognize that my work will mimic much of the work done during my technical research and during my time at the University of Virginia. Technological advancements will continue, apps like ParkMe will still be created at a breakneck pace, all of which can and will influence society and the culture we live in. Despite that, I would still like to recognize the impacts of our creation, including the end-of-life processes. The e-waste issue still remains complex but, my research has shown that there are possible green solutions that other countries have implemented. For the United States to begin considering and implementing these alternative solutions however, further research may be necessary to consider economic, social, and environmental factors.

To close out, I would like to thank my professors for providing guidance during my undergraduate studies and allowing me to capitalize on my time at the University of Virginia.

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