Thesis Project Portfolio

Tap2Change: Cashless Transactions for Panhandlers

(Technical Report)

Consumer Data Collection

(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

With the increasing prevalence of online technologies, my goal for my thesis project and research was to tackle a societal issue in relation to technology as a whole. My technical project was centered around a Design Thinking course taught by Professor James Groves. This class focused on executing projects related to sustainability so my group, Tap2Change, decided to develop an application where individuals could donate directly to panhandlers without the usage of cash.

With the exponential expansion of cashless transactions in our society, our group thought it was critical to include those who are less fortunate to be a part of this increasingly cashless world. The initial project idea was to produce a feature where donors could limit the purchases of illicit substances in our application which in turn would increase the trust in the money they were donating. On the receiving end, we would partner with businesses to provide discounts for purchases made with money received through our application.

Through the Design Thinking process, our group did external research on the challenge space, generated critical requirements that should be satisfied in the application, and selected the most promising solution concept (the application we ended up developing). Professor Yuan Tian (our technical advisor) overlooked the development of our application to make sure it followed the industry standard. For the Minimum Viable Product (MVP), we developed an application that uses a two-tier architecture with a web frontend, designed for mobile use, and a backend, both developed using Docker containerization and the Django framework. Donors would be able to scan a QR code from a receiver's phone to make a transaction. We used the Coinbase API to conduct these transactions.

When working on the technical project, I realized that our application could have the potential capability of keeping track of information on how much money people donated or how much money panhandlers received. Currently, the government does not have a concrete way of obtaining this information. If our app gained enough traction, it could be a great platform for the government to collect this kind of data, which they would have not received otherwise. This ultimately led to the motivation for my STS research. I started thinking about consumer data collection in general and how society has shaped it. The media along with other individuals harp on all the negative factors of collecting personal data through app usage, but I believe that there are positive factors that most people do not consider.

My STS research is about using the Social Construction of Technology (SCOT) framework to analyze the consumer data collection technology. While it is true that there are many underlying negative factors that should be considered including data privacy concerns, the capitalist nature of corporations, and the segmentation of user data, there are many positives as well. Beneficial factors include the increasing prevalence of online learning, usage of predictive analysis for threat detection, and the greater personalization of content for consumers. The ultimate goal of the paper is to use the main factors of the SCOT framework (relevant social groups, interpretive flexibility, and the technological frame) to analyze this technology to exhibit that spreading preeminent knowledge about this technology and its potential implications could foster greater acceptance and be beneficial for all parties.