

**A Prototype Peer to Peer
Contact Sharing Mobile Application**

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Exchanging digital information has become a chore, an arduous and tedious task. Too often are people using email as a means to transfer files from device to device when it was never designed with that purpose in mind. Modern day alternatives to this are AirDrop and similar technologies that use Bluetooth and WiFi LAN networks to transfer data between devices. The problem is that these solutions are not cross-platform at all, i.e., it is impossible to AirDrop a file from an iPhone to an Android device. My Technical project aims to answer this calling by providing a cross platform solution for exchanging digital information, starting with easily shareable contact information. My STS work discussed two paradoxes of digital trust that I identified in society. The first is that people purchase goods and employ the services of companies that they distrust, which is especially prevalent online. The second paradox is that users' personal data is stored on corporate servers. This research affected my technical project when I decided to change my mobile application from a client-server architecture to a peer to peer architecture.

The technical project resulted in a prototype Android mobile application that was able to transfer data peer to peer using Bluetooth Low Energy and WiFi LAN. The app is a basic contact sharing app for now, where users "bump" when they meet to add each other to their address books and then users can "swap" data thereafter. The data they swap for now is limited to basic contact information, but an AirDrop alternative that can transfer any data or file will be implemented later. The chief goal of this project, after the STS influenced redesign, was to create a mobile app that could send significant amounts of data locally between devices, without using the internet at all. This prototype has proven that the concept works and just needs to be fleshed out.

In my STS research I researched the prevalence of two speculative paradoxes related to digital trust as mentioned above. The first paradox, where users utilize services from companies they do not trust, was fueled by the monopoly power each of those companies held in their industry. Facebook is the flagship social media site, Amazon the "best" online retail store, and Google the most effective search engine for the internet. Avid users of the services provided by these giants have an incredibly

difficult time giving them up since they are so convenient and popular, even when these companies are rife with scandal. The second paradox, where personal information of users is stored on corporate servers, persists due to the client-server architecture for online services that has been the dominant choice for the past decade. This architecture is prone to man in the middle attacks and data breaches that plague technology firms.

The main influence of this STS research on my technical project was transitioning the project architecture from client-server to "peer to peer". The client-server architecture involved making queries from the mobile app to an API server that I programmed, that then queried a PostgreSQL database for any resources that were needed. This was problematic as my STS research showed that client-server systems are prone to lots of malicious attacks. My prototype app was also going to be dealing with users' personal information and I wanted to be as careful with it as possible and preferably not store any of it on a remote server. Therefore, I decided to try implementing a peer to peer system that sent the data from the mobile device directly to another mobile device without using the internet. This eliminated a lot of possible attack routes and decreased the data transfer time between devices since they no longer had to query my remote server. The concept worked and was able to send contact information from one device to another completely offline. I am glad my STS research affected my technical project as my mobile app will now be a lot more unique than it might have been as a client-server app. I plan to continue working on this project after graduating and releasing a minimum viable product before next fall.

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