Thesis Portfolio

Peer-to-Peer Variable Service Transactions
(Technical Report)

Accessibility Needs of Senior Citizens as a Factor for Designing Mobile Applications
(STS Research Paper)

An Undergraduate Thesis

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Table of Contents

Sociotechnical Synthesis

The STS research paper focuses on the challenges faced by individuals with accessibility needs, chiefly senior citizens, in accessing software on mobile devices. Adoption of smartphones and the internet-based platforms that come with them have replaced or are actively replacing many conventional means of communication and access to services. Everyday things replaced by mobile technology include ads in newspapers, paper mail, radio stations, local news outlets, taxi services, photo albums, most film and digital cameras, and even brick-and-mortar stores. These things are all integral to living life with dignity and independence, a central challenge of aging. I personally became aware of this issue while watching my ageing parents, especially my mother, try to use their smartphones. Using certain applications was so frustrating that they would give up or at least not receive the full benefit the application provides. I witnessed them having so much difficulty placing a takeout order from a restaurant, buying something online, or sharing photos with a relative that they abandon the effort entirely. Of highest concern was that many of my parents' complaints revolved around things like button visibility, intuitive navigation through apps, and vague gestures like a swipe or tap-and-hold that would not be a problem for a younger user. As the population of seniors explodes relative to other groups (and as recent data suggests, the birth rate slows) over the next few decades, this technology has the potential to both exclude these individuals from services and provide these individuals new means of accessing services.

The technical project sought to build a mobile application called Hamlet that utilizes Peer-to-Peer Variable Service Transactions (P2P-VST) systems and context-aware matching algorithms to enable community members to fulfil each other's service needs. Part of the

inspiration for this project came in the early days of the pandemic when supply chains worldwide struggled to adapt to large-scale changes in demand across almost all sectors. Many communities found themselves needing to find ways to meet each other's needs such as having groceries delivered or getting tutoring help with online classes. Thus, an application that could connect members of the community with each other to fulfill these needs was proposed. Additionally, the shift toward gig-type platforms like Uber and Task Rabbit in recent years as part of a growing 'sharing economy' makes this application especially relevant.

The technical project and STS research paper are closely related by their proximity to the growing use of mobile technology at the community level. Hamlet sought to create a community of sharing and cooperation through peer-to-peer service exchanges. Senior citizens are chief among groups that need the support of the community to thrive. Services like grocery delivery or help with moving furniture can be easily fulfilled by most normal people but are essential to living a good life as a senior. Thus, an app like Hamlet could either serve to enable the community to support its elders or serve to isolate its elders with an application that those individuals cannot use effectively. Further, similar applications could have an impact beyond just providing access to services. Every time someone is connected to a peer for the first time, a new bond is formed that creates a tighter community. This tighter community can share not only services, but perhaps food, resources, friendship, and economic opportunity. The vision of a community that can bring its residents closer to its elders and each other and make access to services truly universal can be in part realized by mobile technology and intelligent, human-centered design.