

Undergraduate Thesis Prospectus

Helping Individuals with Demographic Differences to Communicate Better

(Technical Research Project in Computer Science)

Apple and the FBI: Divergent Ideas about Privacy and Security

(STS Research Project)

by

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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General Research Problem

How are divergent perspectives best managed in communications?

People often “make decisions based on what [they] already believe,” without listening to other perspectives (Headlee, 2015). This makes communication competitive instead of cooperative (Zenger & Folkman, 2016). Poor communication desensitizes people to what others say (Treasure, 2011). People can see topics in a new light and better understand others when they listen to diverse perspectives (Zenger & Folkman, 2016).

Helping Individuals with Demographic Differences to Communicate Better

How can individuals with demographic differences learn to communicate better?

The Sum, led by Elliott Cisneros, is a Charlottesville, Virginia non-profit partnered with the Heather Heyer Foundation which promotes personal growth, skill development, and diversity. The goal of the The Sum is to stand in solidarity with all people, no matter their background. The Sum offers a Power of Difference Assessment (PDA). The PDA gathers participants’ demographics and asks a series of demographic-based questions. After taking the PDA, a report with results is generated and emailed to the participant. The results are categorized across demographics, areas of strength, and areas of growth. The results help reveal people’s demographic biases. Those that take the PDA can meet with a consultant from The Sum to learn about their biases and how to communicate better across demographics. There are paid, free, and organizational versions of the PDA with the only difference being the length of the consultation received (“The Sum”, n.d.).

The Sum already has an online PDA system in place. The current system allows users to take the PDA and schedule a consultation. However, the system is error-prone. The system

improperly categorizes results and it requires someone at The Sum to manually generate reports and email them to users. As part of report generation, categorizations are manually checked and corrected. This makes report generation time consuming and prone to human error. Although manually generating a report only takes a few minutes, the time from PDA completion to reports being emailed to users varies based upon availability at The Sum and can take up to 24 hours. This methodology is not scalable and cannot support the upcoming UVA Department of Psychology study of 1,000 PDA takers. In addition to this, the current system does not detect a difference between assessment versions. It is also insecure and allows for URL manipulation.

The goal of this capstone project is to make a new PDA system. The new system should include all the features of the current system. The new system should correctly categorize results, generate reports, email reports to users, and detect which version of the PDA is being taken. For organizational and paid versions of the PDA, the new system should handle organizational access and payments correctly. The new system should also have security checks in place to prevent revisiting previously answered questions and URL manipulation.

In order to make the new system, requirements had to be gathered from The Sum. Requirements determine what features should be part of the new system and which features should be prioritized. Feature prioritization impacts the development timeline. Requirements help track development progress. Separating the work into requirements allows the team to determine who works on which features. Most importantly, requirements establish clarity between the capstone project team and The Sum for what is to be built.

Minimum requirements are to make a system where users can sign up with a valid email address, undergo email verification, select which version of the assessment to take, fill out user demographics, answer each question of the PDA, only view one question at a time, only answer

questions in order, and have access to the separate consultant scheduling system. Users cannot change responses to previously answered questions. For the minimum requirements, assessment versions do not have to differ and The Sum should have administrator access to the system so they can view results, generate reports, and email reports to users.

Desired requirements include having the system correctly categorize results, generate reports, and email the reports to users and The Sum. Desired requirements also include implementing the paid and organizational versions of the PDA, moving the system to the cloud for scalability, and enhancing the systems administrator experience for The Sum.

Optional requirements include integrating the consultant scheduling system with the PDA system, supporting mobile devices, supporting changing the PDA questions, letting The Sum give consultants permissions to view specific user's results within the system, and allows organizations to view the results for their members who have taken the PDA.

Apple and the FBI: Divergent Ideas about Privacy and Security

How did the 2016 Apple-FBI dispute reveal divergent ideas about privacy and security?

Views on privacy and security diverge. They are often viewed as competing forces. There is no consensus on whether privacy or security is more important. 93% of American adults value privacy and “being in control of who can get information about them.” Only 6% of American adults are “very confident” that government agencies can keep their information private (Madden & Rainie, 2016). Belanger et al. (2002) found that people value “security features” over other “trust indices” such as privacy.

Cultures differ in how much they value privacy; cultures that emphasize individuality value privacy more than cultures that value the group more than the individual (Larson &

Medora, 1992). Some countries have tried to censor citizens, control information access, and limit privacy by banning virtual private networks and Tor. (Tor Project, 2019).

In 2006, the Greek government had wiretapping capabilities put into mobile phones. This privacy reduction was meant to increase security, but became a security issue when a third-party intercepted communications between the Greek Prime Minister and other officials (Chandler, 2007). Increasing surveillance for security reasons while reducing privacy is a common response to terrorism. Examples include the United States' Patriot Act, Canada's Anti-Terrorism Act, and India's Unique Identity Project (Hiranandani, 2011). Increasing surveillance creates new attack vectors as communications can be intercepted and collected data can be stolen or leaked.

Many participants are linked with this research problem. In 2016, Apple refused an FBI request to make a version of the iPhone Operating System (iOS) that "would create a backdoor" to encryption (Cook, 2016). The FBI wanted Apple to disable the iOS "auto encryption feature" (Comey, 2016). The Reform Government Surveillance group does not want the federal government to require "any security vulnerabilities" in its products (RGS, n.d.). The National Sheriffs' Association wants law enforcement to be able to "fulfill its obligation to investigate crimes" (LaBahn et al., 2016, p. 3-4). The Electronic Privacy Information Center (EPIC) stands for consumer rights to strong encryption and they support "the protection of privacy and personal data" ("Apple v. FBI," 2016). The California State Sheriffs Association, however, claims the FBI is "hampered in its efforts to provide for the public's safety" due to Apple's actions (Mayer et al., 2016, p. 4). The American Civil Liberties Union (ACLU) does not want the FBI to force Apple to "go beyond the well-established duties of citizens to aid law enforcement" (Sweren-Becker, 2016). The Electronic Frontier Foundation (EFF) does not want

to set a legal precedent that makes companies undermine customer security protections (Buttar, 2016).

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