Thesis Project Portfolio

Agile Web Application Development: Displaying Twitter Trends to Better Understand Current Events Around the World

(Technical Report)

User Perceptions of Accuracy and Data Privacy of Smart Fitness Devices

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science

University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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Spring 2023

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Table of Contents

Sociotechnical Synthesis

In the STS research paper, I explore users' perceptions about the accuracy and data privacy of smart fitness devices. I investigate the general accuracy of step counting, heart rate tracking, and calories burned of smart fitness devices. I also examine four companies that produce fitness devices and applications (Apple, Fitbit, MyFitnessPal, and Strava) to get a sense of how protected user data is. Users' perceptions of these devices is important in the development of technology. The STS framework Technological Momentum is used to look at how these devices shape society and vice versa. It is not a one-way causal relationship where technology shapes society or society shapes technology solely. Rather, both influence one another where society drives the development of technology and technology, in turn, shapes society. When the smart fitness devices are not meeting consumers' needs in terms of accuracy of health information or privacy of their data, users may demand changes from the producers which drive the development of the technology. In a similar way, the technology may shape society if the devices are popular enough to create a culture of fitness or if users decide to make new laws to protect their data.

In the technical report, I document my experience as an intern over the summer of 2022. I worked in a team of interns to build a web application to display globally trending Twitter topics in a more user-friendly manner so that users can get a better idea of current world events. In addition to creating a web application, I learned more about agile software development. Our team followed a specific agile development framework called Scrum, and my primary role was as Scrum Master where I guided the team in following the best practices for this framework.

My STS topic and my technical topic involve rather different issues, but social media can loosely tie the two topics together. Fitness trackers have become their own social media for users

to connect and share data with their friends while Twitter is a more traditional social media platform. Additionally, user feedback is an important component when developing a web application, and user feedback for fitness trackers is crucial in how society shapes technology.