

Sociotechnical Synthesis

The main focus of both my STS research paper and technical report is to investigate the impact of applying the design thinking paradigm in the development of cybersecurity products, especially that of authentication systems to verify the identity of users. Although the topics of these papers are very similar, there are a couple of important distinctions. Firstly, the technical report primarily details the practical benefits of this paradigm, whereas the STS paper explores how design thinking may affect social imbalances in cybersecurity. Another difference is that the technical report goes more in-depth about how software engineers can be educated on design thinking principles, and it proposes modifications to the curriculums of cybersecurity courses at the university level.

In the technical report, I performed a meta-study to explore how design thinking concepts have been used to combat and prevent cyber attacks. I looked into existing systems related to threat modelling and the security features of smart homes in order to determine how the stages of design thinking process resulted in more robust and technically-sound software solutions. I also researched proposals for authentication systems that are developed through design thinking and how these systems might influence cybersecurity if properly implemented. Also, I considered how students might benefit from being educated about this paradigm. The technical report is concluded with an explanation of what the incorporation of design thinking in cybersecurity education might look like and what potential advantages it has. There is also a brief look into future project ideas that I could carry out in order to confirm my own theories.

As for the STS research paper, I focused on the social and ethical issues surrounding the current techniques used to develop authentication software. Integrating ideas from Langdon Winner's theory of whether artifacts have politics, I discussed how discriminatory aspects of

society may be reflected by the innate nature of some biometrically-based products, and how the design thinking process has the potential to minimize such harmful effects. To do this, I compiled texts that describe how members of marginalized groups have been prevented from being able to fully experience and benefit from particular authentication systems. I then discuss how Winner's theory may apply to such systems and what they say about our society's values. There is also a detailed look at past case studies in which researchers have successfully applied design thinking concepts in the development of cybersecurity systems and how the results of their experiments indicated that this concept really could help promote accessibility and fairness.