

**Thesis Portfolio**

**Identityti: Digital Storage of Personal Identification Documents**

(Technical Report)

**The Evolution of Online Marketing and the Implications of its Current Practices**

(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

Chris Han  
Spring, 2020

Department of Computer Science

## **Table of Contents**

Sociotechnical Synthesis

Identyti: Digital Storage of Personal Identification Documents

The Evolution of Online Marketing and the Implications of its Current Practices

Thesis Prospectus

## **Sociotechnical Synthesis**

### **Introduction**

For engineers entering the field of computing, it is important to understand the ethical nuances when working with computers and the Internet. It is hard to define a comprehensive ethical code that encompasses all aspects of computing because of the endless amount of uses for computers. The following portfolio consists of two projects about Internet privacy. When discussing the ethics of Internet privacy, the core issue is about the ownership of personal data and the extent of personal data that Internet platforms should have. The STS research paper explores the tradeoff between convenience and user privacy as it pertains to online advertisements and social media and its effects on users as well as society. When researching a topic like this, it is typical to view the social media companies as the antagonists in the fight for privacy. To gain a better insight on the social media companies' perspectives, the capstone project is to create a web application in which the collection of personal data is a main focus. The capstone project is a web application called "Identityti" that allows users to upload and store their official documents onto the cloud for simple access and transfer. By viewing the battle of personal data from the receiving end, this will give a better understanding of the personal data necessary for the essential functions of today's Internet applications.

### **Capstone Project Summary: Identityti**

This capstone project is a cloud storage web application called "Identityti," similar to services like Google Drive. The purpose of Identityti is to store and organize users' official documents such as driver's licenses and tax forms. Once uploaded to Identityti, the documents can be shared to official enterprises or institutions such as the Department of Motor Vehicles or the

Internal Revenue Service. The motivation for this product is to facilitate the process of applying and submitting official documents. Most government-related applications require people to provide a physical copy of the required documents. These documents, such as a social security card, can be easily lost or destroyed. Identity provides a secure and reliable access to these documents by taking advantage of today's cloud capabilities.

### **STS Research Paper Summary: The Evolution of Online Marketing and the Implications of its Current Practices**

This STS research paper investigates how advertising has adapted to a more interconnected, online society over the 2010s. As access to the Internet and quality of online platforms improved, the Internet became people's main method of consuming media. Because the Internet allows for two-way communication, advertisements have improved immensely since 2010. Collection of user data has allowed marketing agencies to target consumers with personalized advertisements. The use of personal data by social media and advertising companies has raised concerns over privacy. These privacy concerns are evaluated in order to answer the question: how has online marketing changed from 2010-2019 and how are users responding to the potential privacy implications? This research is conducted within the framework of technological momentum. As social media platforms improved, more people began using them creating an ideal audience for advertisements. Social media companies recognized the value of the personal data users put on their website as well as the large number of users and began investing into their advertising infrastructure to improve user tracking and advertising targeting since advertising became the main, if not the only, source of revenue for these social media companies. It is expected that this research will reveal that social media

companies are developing advertisements to become more profitable at the expense of user data, which helps answer a common question in STS: is all technological advancements good for society?

## **Conclusion**

Working on the STS research paper and the capstone project has highlighted the struggle between needing and protecting personal data on online platforms. The STS research paper exposes online advertising practices that are entering a grey area of acceptable uses of user data defined by present Internet standards. The paper explores the privacy implications with the users' interests in mind. However, it also touches on the social media companies' perspective by identifying the social factors that led to the development of these online advertising practices. These social factors include the advertising-based business model used by most free online platforms today as well as the features desired by the platform's users. The capstone project, however, showed how a developer could design their product with user privacy in mind while providing the features users want. This includes properly encrypting data as well as limiting access to that data from the developer. This project has shown that it is possible to develop an online platform without the need for unnecessary infringement of personal privacy. The improved advertising features that allow for more relevant advertisements were developed with business interests in mind and are not necessary for a satisfiable product. While the objectives of a social media platform and Identityti are different, the process of development are essentially the same. The difference being social media features are being developed with the belief that data being a resource whereas Identityti features are being developed with the belief that the use of the data should be avoided if possible.