

**Optimization of Patient Flow and Process for a Primary Care Clinic During the COVID-19
Pandemic**

The Impacts of Data and Information Privacy on Consumer Trust and Behavior

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By
Bryce Huffman

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TECHNICAL TEAM MEMBERS

Margaret Cusack
Claire Dozier
Noor Drissi
Sarah Saas
Alexandra Schmid
Wei Wu

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.

ADVISORS

Dr. Robert Riggs, Department of Engineering Systems and Environment

Dr. Bryn Seabrook, Department of Engineering and Society

Introduction

At a breakneck speed, the invention and continuous innovation of personal digital technologies, such as social media and other online-based platforms, has touched nearly every facet of society. According to the United Nations (2021), these technologies have “advanced more rapidly than any innovation in our history – reaching around 50 percent of the developing world’s population in only two decades” (para. 1). Even more, the expansion and maturation of digital technologies is projected to grow faster into the next decade than that of 2010 to 2021 (Little, 2021). As described by Delia Balaban and Maria Mustăţea (2021), humanities professors at Babeş-Bolyai University, “technological development allows every form of user interaction to be transformed into data” (p. 101). With the rise of such digital platforms and services, consumer’s personal data is broadly collected and stored by firms and associated third parties for purposes including, but not limited to, service curation and advertisement targeting. The transition into the era of a data-centered digital economy inherently brings concerns and issues regarding trust and consumer privacy. Some firms, such as Apple (2021), are making proclamations on the issue by stating “privacy is a fundamental human right” due to its increasing relevance (para. 1). The rapid evolvement of technology and society inherently brings changes in the consumer privacy landscape.

There exists a two faceted reason to understand the impact of product design choices on consumer perception, behavior, and trust. Primarily, products should be designed with a user-centric approach. As such, designers and product developers should try to fully evaluate the scope of their invention’s reach and consider all acting agents in the respective system. In addition, any firm or individual that understands the consumer’s viewpoint of data privacy and perceived trust gains the capability to maximize the positive surplus a product creates (Martin et

al., 2020). In essence, positive benefit exists in both monetary and social forms when privacy is a guiding principle of design. The topic of data privacy and consumer trust will be analyzed in a research paper utilizing the inherent interconnections between science, technology, and society.

Similar to the rationales of why technology designers should consider the implications of their decisions on the end users, healthcare systems face a multitude of choices in determining how to deliver their mission of patient care. The Suite 2100 Clinics at 415 Ray C Hunt Drive in Charlottesville, Virginia within the University of Virginia (UVA) Hospital system contain numerous practices; the practices of primary care, rheumatology, and endocrinology are within the scope of the technical project. All of these practices share common check-in procedures, patient waiting areas, and facility resources and are facing patient throughput inefficiencies. The source of the inefficiencies is the result of lackluster communication, broken understandings of systems for optimization, and long-term challenges and impacts afforded by the COVID-19 pandemic (K. Dowdell, personal communication, September 22, 2021). The research team consisting of Margaret Cusack, Claire Dozier, Noor Drissi, Bryce Huffman, Sarah Saas, Alexandra Schmid, and Wei Wu in guidance from Dr. Robert Riggs aim to conduct a data-driven analysis to provide a set of recommendations to the clinic intended to increase throughput and the patient experience by decreasing overall wait time. The process and recommendations from this project will be documented in a technical report.

Improving Patient Flow for the Suite 2100 Clinics in the UVA Health System

Healthcare delivery is a challenging space to ensure a high-quality patient experience while meeting all requirements and regulations of medicine. Within the University of Virginia Health System, the mission includes “to provide excellence, innovation, and superlative quality in the care of patients” (UVA Health, 2021, para. 1). This mission holds true for the Suite 2100

Clinics at 415 Ray C Hunt Drive located within Fontaine Research Park. Although the Suite 2100 contains a variety of practices, the researchers will focus on primary care, rheumatology, and endocrinology practices due to the direct overlap of facilities and resources. The researchers plan to approach this project to exemplify UVA's vision of bringing together academia and medical care to push the institution and society forward (University of Virginia, 2021).

Patients at the Suite 2100 clinics currently complete two check-in procedures followed by a waiting period before being admitted back to a patient room. The first check-in procedure occurs at building entry and is shared with all offices within Suite 2100. This initial pre-registration is intended to complete all insurance and demographic information updates. Upon completion, patients relocate to the second floor and check-in at the clinic desk; the clinic desk is shared between primary care, rheumatology, and endocrinology. After the second check-in, patients reside in a nearby waiting area until roomed by a nurse or other staff. Patients then often experience waiting periods while in the room before seeing their provider. As patients can be subjected to wait times in multiple places, the team wishes to optimize the system to decrease the total amount of time spent in such waiting states.

The clinic infrequently uses data to better understand the system flow to make improvements. However, the clinic has a wealth of data available within the UVA Health MyChart platform that records extensive levels of data regarding patient visits (K. Dowdell, personal communication, September 22, 2021). The researchers plan to utilize relevant portions of this dataset along with in-person observational data to drive the path of the project. The observational data is critical to capturing information not found within MyChart and to enable the team to develop a better understanding of the clinic's current state. In conclusion, the use of

data mining and statistical principles will enable targeted recommendations supported by clear, strong evidence.

The researchers plan to execute a three-phase plan to improve the overall patient experience at the clinics. These phases include understanding the current system state and conditions, conducting a data-driven analysis of doctor scheduling and utilization, and then applying observational and clinic electronic medical record (EMR) data to develop a set of recommendations to provide to clinic management. The research plan is subject to change throughout the course of the project based on stakeholder input and changing conditions that continue to arise from the COVID-19 pandemic. The research will be recorded in a technical report and submitted for publication in a relevant academic journal.

The final conclusions from the technical team's work are intended to decrease the overall patient wait time throughout the facility thus improving the patient experience while simultaneously increasing office throughput capacity. Improving the clinic from a patient or user focused perspective enables for maximized benefit for all parties involved and adheres to the mission of the University of Virginia Health System.

The Impacts of Data and Information Privacy on Consumer Trust and Behavior

Privacy has no single definition but rather exists as a heterogenous makeup of ideologies amongst scholars and subject matter experts. As referenced in research by Louise Cooke (2008), a professor of information and knowledge management at Loughborough University, privacy was historically "understood as concerning itself with notions such as secrecy, solitude, security and confidentiality" (p. 167). However, with the rise of big data, a novel framework of privacy, coined as informational privacy, was explained by Luciano Floridi (2005), a professor of Philosophy and Ethics of Information at the University of Oxford, as relating to the extent to

which third-parties have access to an individual's personal data and information. The idea of informational privacy was again echoed by privacy researchers who asserted privacy is "the state of being free from public attention" (Cohen et al, 2020, p. 4). The definition of privacy has evolved over time with the changing state of technological development.

Using the notion of informational privacy enables each technologic advancement and the era of big data to be viewed from the perspective of how prohibitive it is for others, whether unauthorized or authorized, to obtain data on an individual. It is critical to focus not only on those who gain unauthorized access but also on those who possess authorized access to an individual's data. Due to government regulation, most products and services require users to agree to a terms and conditions or privacy policy prior to using the service. However, as explained by communications professors Jonathan Obar and Anne Oeldorf-Hirsch (2020), customers often accept usage terms and conditions or privacy policies without much examination of the documents. They described this observation with the paradox of "when asked, individuals appear to value privacy, but when behaviors are examined, individual actions suggest that privacy is not a high priority" (p. 22). Furthermore, this aligns with the results of a North American survey that found, "87 percent [of customers] – said they would not do business with a company if it gave away sensitive data without permission" (Anant et al, 2020, para. 1). Consumers of digital technologies often grant access to data without considering the potential risks. The plurality in the definition of privacy in terms of consumer data combined with the paradoxical elements of individual behavior bring relevance and urgency to the issue of data privacy and the internalized fostered trust.

Although the issue of informational data privacy should take a customer or user-centric approach, that does not necessitate a mutually exclusive benefit to any sole party. As detailed by

psychology researcher Edward Wang (2019), any lack of positive consumer perception of a firm's privacy practices can lead "to losses for online businesses and exerting a considerable negative effect on online business performance" (p. 60). Although Wang strictly mentions online business, their idea should apply to traditional, in-person firm interactions as most, if not all, entities have an underlying online presence. For example in an opinion piece for the New York Times, Michael Kwet (2019), a visiting fellow at the Information Society Project at Yale Law School, brings awareness to the level of surveillance that often occurs in a physical store without awareness of the customer. Kwet notes how Bluetooth beacon sensors are often placed throughout stores to collect data on customers by using their personal devices without consent. Therefore, the notion that one can entirely escape the virtues of online data collection is practically mistaken. To restrict the issue of data privacy regarding customer trust and perception to online-only platforms would be short-sighted and inadequate to face the society of big data and technologic innovation that exists today and continues to develop.

STS Research Methods and Frameworks

Research question: What are the implications on data privacy practices on consumer trust and behavior within the scope of the United States of America? The research question is limited to United States consumers as "the perception of online consumers, the privacy culture, vary as indicated in various global surveys" (da Veiga, 2018, p.1). The STS framework of actor-network theory will be used to explain several of the primary actors, such as governments, firms, and customer archetypes, along with the linked translations that occupy the subject.

Actor-network theory, often referenced as ANT, is an STS framework that uses the identification and study of all actors with a network or system through intermediaries and translations (Cressman, 2009). As explained by David Cressman, an STS scholar at Maastricht

University, each inclusion in the framework is considered both an actor and a network as “an actor-network is simultaneously an actor whose activity is networking heterogeneous elements and a network that is able to redefine and transform what it is made of” (p. 3). Although complex, viewing each actor as a network in the context of consumer trust and behavior in regard to data privacy enables linkages to be explained that show how each item has influence over the others. In a simplistic view, no single actor in the system of data privacy can exist or be changed without exerting influence on at least one other part of the system. Previously, actor-network theory has been used to examine how airport security and scanning systems can be approached in design by developing a heterogeneous model that has specific technologic arrangements (Valkenburg & van der Ploeg, 2015). Although actor-network theory has been criticized for minimizing the influence of existing social structures (Modell, 2020), it remains valuable to explain the interactions between webs of actors. Viewing the issues of consumer trust and behavior from data privacy has no single path, however, actor-network theory will enable a comprehensive analysis and thoughtful understanding.

To reach the goal of an analysis of consumer trust and behavior in the lens of data privacy, multiple research methods will be used. Primarily, the researcher will rely on discourse analysis as it provides an avenue for conglomerating past research and insights in the field. Keywords consisting of data privacy, perception of trust, and consumer behavior will be utilized to find resources. In addition, discourse analysis allows for the synthesis of many forms of information thus enabling a comprehensive viewpoint to be established. Although conducting first-person surveys and interviews are not feasible in the scope of this thesis, those found in literature will be used to gather public opinion and stances. Furthermore, the analysis may include elements of policy analysis as both firm and government regulation of policy can be

viewed from a perspective of trade-offs, costs, and benefits. Lastly, elements of network analysis will be used to explain the hierarchical structure that exists within the system; this will particularly be evident with regards to firm, state, and federal level data privacy regulations. The synthesis of each of these research methods, in varying amounts, will empower the researcher to fully analyze each of the complex actor-networks that relate to the customer-centric view of data privacy.

Conclusion

This paper includes a sociotechnical analysis of consumer trust and behavior through the lens of data privacy framed by actor-network theory and a data-driven project at the UVA Health Suite 2100 Clinics to improve patient care experiences through reduced waiting times.

Understanding how the rise in digital technologies and big data influences consumer trust and behavior is critical to ensuring systems are designed for the benefit of the end-user. Furthermore, awareness into the potential negative implications of system data privacy is important to ensure technologies are designed to limit such impacts and to instead better social welfare to help progress society forward. Many technologies today do not provide clear methods for users to protect their own privacy but also are nearly impossible to avoid due to them being interwoven in the mesh of society. The system of data privacy is expansive and complex, but the use of actor-network theory will enable the completion an extensive analysis. The learnings from this analysis hold potential to help ensure future technology is designed with positive, user-centered intentions that enables minimization of harm that stems from poor privacy practices.

Healthcare has and will continue to be a challenging field of utmost importance; this became more evident recently with the rise of the COVID-19 pandemic. Above all, the objective of healthcare is to make the life of each patient better. The technical research into the three

practices within the Suite 2100 clinics at UVA Health will allow for higher quality care via increased patient experiences through a reduction in system inefficiencies. The emphasis on a data-driven approach with top-down design thinking will ensure patients remain central to all recommendations and changes.

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