Chapter 5
Digital Footprints and the Battle for Data Sovereignty:
Digital Privacy, Security, and Ownership

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ABSTRACT

In the age of digitization, concerns about digital security and data ownership are paramount. The chapter investigates the cyber threatscape, noting the role of state-backed collectives. Essential defense tools, such as encryption and two-factor authentication, are contrasted with significant breaches like the 2014 Yahoo incident. The commodification of personal data by tech giants for advertising underlines the urgent need for clear data ownership guidelines. The balance between online utility and privacy is challenging, with corporations holding significant power due to vast data reserves. A proposed "digital bill of rights" could provide a universal rights-tech alignment. Future challenges lie in AI implications and the rise of quantum computing, leading towards "surveillance capitalism." Solutions involve quantum-resistant cryptography, AI-data safeguards, and enhancing digital literacy. The chapter advocates for balancing digital advancement with individual rights for a secure digital future.

1. INTRODUCTION

We stand at a pivotal juncture in history, an era profoundly characterized by the omnipresence of digital interactions. The emergence and rapid adoption of digital technologies, from smartphones' near-universal reach to the vast networks of social media platforms, has undoubtedly ushered us into the 'digital age' (Castells, 2011). A transformative period, this age presents us with unparalleled conveniences — instant communication, swift transactions, and a world of information at our fingertips. Yet, it's not without its

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array of new and evolving challenges. Every online action, whether it's a tweet, a digital purchase, or an innocuous Google search, contributes to a complex matrix of digital traces. Collectively termed our "digital footprint", these traces are more than just bits and bytes; they serve as digital reflections of our behaviors, interests, and even our aspirations (Mayer-Schönberger, 2009). As technology continues to advance, the granularity and breadth of these footprints have only expanded, painting a detailed digital portrait of our lives. The very essence of these footprints offers a double-edged sword. On one side, these traces enable more personalized and streamlined online experiences. Algorithms utilize this data to tailor content, advertisements, and recommendations precisely to individual preferences, effectively enhancing user engagement (Haggart, 2019). However, the other edge of this sword poses critical challenges. Questions about the safety, privacy, and ownership of this data remain more relevant and contentious than ever.

Our digital footprints, as expansive as they are, have become a goldmine for numerous stakeholders. Tech giants, marketers, and even governments discern invaluable insights from these footprints. While this can lead to improved user experiences and insights for businesses, it simultaneously sparks concerns. Personal privacy stands at the frontline of these concerns. As revelations from events like the Facebook-Cambridge Analytica scandal showed, unauthorized data access can lead to significant manipulations, impacting democratic processes (Cadwalladr & Graham-Harrison, 2018). Moreover, the integrity and security of this data are under constant threat. Data breaches, often making headlines, highlight the vulnerabilities inherent in storing and managing massive amounts of personal data. Such breaches not only risk financial and personal information but also erode public trust in digital platforms (Romanosky, 2019).

Then there's the complex issue of data ownership. As users generate data, a debate rages on about who truly owns it. Is it the platform that collects and stores it, or the individual who produces it? This question becomes more intricate considering the vast monetization machinery that thrives on this data (Strassburg et al., 2020).

As we delve deeper into this chapter, our focus will remain affixed on understanding the myriad facets of digital footprints. We aim to dissect the quest for data sovereignty, a journey that encompasses individual rights, corporate interests, global policy considerations, and fundamental human rights in an increasingly digitized world (Polčák, & Svantesson, 2017).

By traversing this landscape, we hope to provide readers with a comprehensive grasp of the challenges, implications, and potential futures of our digital footprints in this age of interconnectedness.

2. UNDERSTANDING DIGITAL FOOTPRINTS

In the vast expanse of the digital universe, every individual action casts a shadow. This shadow, often referred to as a "digital footprint," embodies the data residue left behind as a result of our interactions on digital platforms. This concept is much more than just a metaphorical trace of our online presence; it encapsulates a myriad of information ranging from active online behaviors, like social media posts and email correspondences, to passive data collections such as IP address logs and the ubiquitous digital cookies (Mayer-Schönberger, 2009). Historically, the digital footprint of an individual during the early days of the internet was rather rudimentary. It predominantly comprised basic elements such as browsing records and email interactions. However, the digital revolution, characterized by the emergence of social media, e-commerce, and innovative tracking mechanisms, has rendered these footprints far more