Evaluation of Ad Transparency Systems

Kevin Bryson, Arthur Borem, Phoebe Moh[†], Omer Akgul[‡], Laura Edelson[§]
Chris Geeng[¶], Tobias Lauinger[¶], Michelle L. Mazurek[†], Damon McCoy[¶], and Blase Ur
University of Chicago, [†]University of Maryland, [‡]Carnegie Mellon University,
[§]Northeastern University, [¶]New York University

Abstract—In this research proposal, we outline our plans to examine the characteristics and affordances of ad transparency systems provided by 22 online platforms. We outline a user study designed to evaluate the usability of eight of these systems by studying the actions and behaviors each system enables, as well as users' understanding of these transparency systems.

1. Introduction

Targeted advertising, also called online behavioral advertising, is the practice of customizing the ads a particular user receives based on inferences about their interests and demographics. In recent years, platforms like Facebook and Google have created new ways to target, track, and infer users' characteristics, activities, and interests. Nevertheless, individuals struggle to understand and control their data and are often unaware of systems that provide transparency and agency over personalized advertising to users [1]–[6].

Laws like the GDPR, DSA, and CCPA have sought to reduce this asymmetry by establishing rights to transparency [7]–[9], actualized through mechanisms like data downloads [4]. Though data downloads in theory should provide a better understanding of the data collected by a company, in practice they may generate new barriers for users, including both the knowledge barrier for users to open JSON files and significant time delays in receiving the data [4]. Similarly, studies of other ad transparency mechanisms on Google [1], [6], [10], Facebook [3], [10]–[14], and Twitter [10], [15] have uncovered usability challenges and shortcomings in disparate systems. Nevertheless, these systems have not yet been studied comparatively across many platforms. In response, we construct a taxonomy of the features present in 22 ad transparency systems and propose a user study that asks how these features impact usability.

2. Methods

We first created a taxonomy of popular platforms' existing ad transparency systems. Searching for ad transparency systems among Tranco's top 150 domains, we found that many had 'static', non-personalized transparency systems. However, 22 domains offered the types of personalized ad transparency systems we hoped to study. For each interface, between August 2022 and October 2023 we collected screenshots from the desktop interfaces of every transparency-relevant screen. We labeled each screenshot with its location in the site navigation hierarchy and a brief description—these were the units of observation to be coded. Codes were defined by two authors, who defined them independently and met to resolve disagreements. Another primary coder and additional research assistants (secondary coders) coded the interfaces in pairs, resolving disagreements following a similar process. The primary coder held multiple sessions with the secondary coders to train them in using the codebook and introduce them to ad transparency systems. The resultant taxonomy characterizes the affordances present in an ad transparency system as they relate to the *flow* of data, the ways users can *explore* the interface, the types of *controls* offered, *types of data*, and various *types of platform information* (e.g., advertisers associated with a user). We propose the following user study to give a more complete portrayal of the relation between affordances, interface design, and the usability of the system.

Our proposed between-subjects user study was designed for the mobile interfaces of these systems. We found that the desktop versions were typically identical to the mobile versions or had more affordances than their mobile counterparts, making them ideal for constructing a comprehensive taxonomy. In contrast, we hypothesized that mobile interfaces would be more familiar to most users and thus more suitable for a user study. Using the classifications from the taxonomy, we categorized systems based on the affordances they provided: ♠ *all affordances* (Facebook, Google, LinkedIn), ♣ *most affordances* (Twitter, TikTok, Instagram), and ◇ *some affordances* (Reddit, eBay). We focus on three affordances: 1) interfaces that show users which topics the platform has inferred about them (♠); 2) interfaces that explain why a user was shown an ad (♠ ♣); 3) interfaces that let a user manage the use of third-party data in personalized advertising on the platform (♠ ♣ ◇). Participants will follow our instructions to navigate to each relevant interface, interact with these affordances, then answer questions. These questions cover awareness of the system, participants' needs with respect to control over personalized advertising (and whether the platform allowed them to carry out actions to fulfill that need), changes they made to settings (and why), their understanding of the options offered, and unresolved questions the participant has. While not every platform has each affordance, we hope to learn what impact they do have on usability and understanding of transparency systems.

Acknowledgment

References

[1] F. M. Farke, D. G. Balash, M. Golla, M. Dürmuth, and A. J. Aviv, "Are Privacy Dashboards Good for End Users? Evaluating User Perceptions and Reactions to Google's My Activity," in *Proceedings of the 30th USENIX Security Symposium*, 2021.

[2] V. Sharma and M. Mondal, "Understanding and Improving Usability of Data Dashboards for Simplified Privacy Control of Voice Assistant Data," in *Proceedings of the 31st USENIX Security Symposium*, 2022.

[3] H. Habib, S. Pearman, E. Young, I. Saxena, R. Zhang, and L. F. Cranor, "Identifying User Needs for Advertising Controls on Facebook," *Proceedings of the ACM on Human-Computer Interaction*, vol. 6, Mar. 2022.

[4] S. Veys, D. Serrano, M. Stamos, M. Herman, N. Reitinger, M. L. Mazurek, and B. Ur, "Pursuing Usable and Useful Data Downloads Under GDPR/CCPA Access Rights via Co-Design," in *Proceedings of the Seventeenth Symposium on Usable Privacy and Security*, 2021.

[5] B. Weinshel, M. Wei, M. Mondal, E. Choi, S. Shan, C. Dolin, M. L. Mazurek, and B. Ur, "Oh, the Places You've Been! User Reactions to Longitudinal Transparency About Third-Party Web Tracking and Inferencing," in *Proceedings of the 2019 ACM SIGSAC Conference on Computer and Communications Security*, 2019.

[6] J. Earp and J. Staddon, ""I Had No Idea This Was a Thing": On the Importance of Understanding the User Experience of Personalized Transparency Tools," in *Proceedings of the 6th Workshop on Socio-Technical Aspects in Security and Trust*, 2016.

[7] European Parliament and Council of the European Union, "Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)," May 2016.

[8] European Parliament and Council of the European Union, "Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC (Digital Services Act)."

[9] State of California, "California Consumer Privacy Act of 2018," 2018.

[10] L. Edelson, S. Sakhuja, R. Dey, and D. McCoy, "An Analysis of United States Online Political Advertising Transparency," Feb. 2019. arXiv:1902.04385.

[11] A. Sabir, E. Lafontaine, and A. Das, "Analyzing the Impact and Accuracy of Facebook Activity on Facebook's Ad-Interest Inference Process," *Proceedings of the ACM on Human-Computer Interaction*, vol. 6, Mar. 2022.

[12] P. Arias-Cabarcos, S. Khalili, and T. Strufe, "'Surprised, Shocked, Worried': User Reactions to Facebook Data Collection from Third Parties," Sept. 2022. arXiv:2209.08048.

[13] A. Andreou, G. Venkatadri, O. Goga, K. P. Gummadi, P. Loiseau, and A. Mislove, "Investigating Ad Transparency Mechanisms in Social Media: A Case Study of Facebook's Explanations," in *Proceedings of the 2018 Network and Distributed System Security Symposium*, 2018.

[14] J. Im, R. Wang, W. Lyu, N. Cook, H. Habib, L. F. Cranor, N. Banovic, and F. Schaub, "Less is Not More: Improving Findability and Actionability of Privacy Controls for Online Behavioral Advertising," in *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*, 2023.

[15] M. Wei, M. Stamos, S. Veys, N. Reitinger, J. Goodman, M. Herman, D. Filipczuk, B. Weinshel, M. L. Mazurek, and B. Ur, "What Twitter Knows: Characterizing Ad Targeting Practices, User Perceptions, and Ad Explanations Through Users' Own Twitter Data," in *Proceedings of the 29th USENIX Security Symposium*, 2020.