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Privacy-Centric Digital Advertising: Implications for Research

Garrett A. Johnson, Julian Runge, and Eric B. Seufert¹

1. Introduction: Ad identity under siege

Digital advertising today relies on cross-website and cross-app user identity to measure, target, and optimize ads. However, the extent of the ad ecosystem's reliance on detailed user-level data raises consumer privacy concerns (Tucker 2012; Bleier, et al. 2020). Many jurisdictions have started putting in place privacy laws that restrict advertising practices including the European Union's General Data Protection Regulation (GDPR) as well as state laws in California, Virginia, and Colorado. Large tech companies, in turn, have seized this policy momentum to make privacy-centric changes to their global businesses that are reshaping digital advertising. Marketing academics and practitioners must learn to adapt to this new reality with still more privacy-centric changes on the horizon.

Apple is aggressively moving to protect consumer privacy. In 2019, Apple's Safari browser ratcheted up its efforts to prevent cross-site user identity with version 2 of its Intelligent Tracking Prevention privacy framework. In April 2021, Apple turned its attention to its own iPhone platform by restricting cross-site user identity matching via its App Tracking Transparency (ATT) framework. Under ATT, apps need to explicitly ask users for consent before exchanging user-level data with third parties. ATT opt-in rates are low (Laziuk 2021), which can harm the businesses that depend on mobile advertising (Chen 2021; Wagner 2021). As a substitute for device-level identity and advertising attribution, Apple created SKAdNetwork (SKAN) as a measurement solution to provide advertisers with coarse, time-delayed feedback on their post-ad click conversion events (Seufert 2020).

Similarly, Google is sunsetting current identity practices, while simultaneously trying to develop widely adoptable replacement technologies. Google has set a 2023 deadline for preventing

¹ Johnson: Questrom School of Business, Boston University, <garjoh@bu.edu>; Runge: Fuqua School of Business, Duke University, <julian.runge@duke.edu>; Seufert, Mobile Dev Memo, <eric@mobiledevmemo.com>. We thank Randall Lewis and Samuel Goldberg for helpful comments.

cross-site identity and eliminating third-party cookies in its Chrome browser (Google 2021). Citing research showing that cross-site identity boosts website revenue (Johnson, et al 2020; Ravichandran and Korula 2019), Google is proposing an ensemble of privacy-preserving ad technologies referred to as Chrome's Privacy Sandbox (Google 2021). Privacy Sandbox separates the functions performed by cross-site identity into separate replacement technologies for ad targeting (FLoC, FLEDGE), ad measurement (Aggregate & Conversion Measurement APIs) and other uses like fraud prevention (Trust Token API).

In sum, digital advertisers face progressively stronger limitations on their cross-site/app identity practices. In their place, digital advertisers will need to embrace new tactics for digital advertising's privacy-centric future (Runge and Seufert 2021). Marketing researchers have an important role to play in shaping this future. Below, we outline key research avenues in advertising campaign strategy, targeting, and measurement.

2. Avenues for research

2.1 Campaign strategy

Digital advertising has transformed advertising strategy to one of continuous decision-making, measurement, and optimization. Privacy-centric changes will push advertisers back to a discrete strategic mindset. Whereas yesterday's digital advertising afforded virtually limitless creative and campaign permutations, SKAN and Privacy Sandbox restrict the number and minimum size of creatives, campaigns, and measurement cohorts. Whereas yesterday's digital advertising allowed real-time measurement of continuous conversion outcomes, SKAN and Google's Conversion Measurement API restrict conversions to discrete, advertiser-defined types that are reported with delays. Yesterday's digital advertisers could fully exploit user- and impression-level ad buying to avoid waste, for instance, by detecting ad fraud and managing ad frequency to limit saturation. To detect fraud, Google proposes "Trust Tokens" that allow one site (e.g. Facebook) to vouch for a user as being real (rather than a bot committing ad fraud) on another site. To manage ad frequency, advertisers will need to alter their cross-site frequency management strategy to a site-by-site management strategy.

In tomorrow's privacy-centric digital advertising, we must consider: *How should advertisers redesign their campaign strategy?* Seufert (2021) and Facebook (2021) argue that advertisers

should simplify their campaigns and place renewed emphasis on ad creative. Goldfarb and Tucker (2011) point out that advertisers may make their advertising more obtrusive to offset weakened targeting capabilities. Seufert (2021) advocates that advertisers categorize their conversion events by the customer lifetime value associated with different conversion types and values. Marketing researchers could independently evaluate the effectiveness of new fraud-detection technologies like Trust Tokens. Marketing scholars can articulate the tradeoffs between site-by-site frequency caps and cross-site buying efficiencies.

2.2 Ad targeting

Until now, online advertising has been distinguished by superior targeting capabilities (Goldfarb 2014) that improve ad efficiency (Rafieian and Yoganarasimhan 2021). Privacy-centric approaches to digital marketing propose new targeting approaches as well as changes to existing approaches. Google's FLoC proposal envisions creating weekly cohorts each containing thousands of users that share common interests, as inferred from their browsing histories. Users would thus be "hidden in the crowd" and these cohorts could be designed to limit disclosing sensitive information like religion or sexuality (Medina, et al. 2021). Google's FLEDGE proposal allows websites to place users into "interest groups" when they visit that site. To protect user privacy, interest group membership information remains on the user's device and an on-device auction can select an interest group-based ad to show the user on an unrelated site. Finally, the ad industry is upgrading its contextual targeting capabilities (Ada, et al. 2020) and also standardizing seller-defined audiences. Seller-defined audiences allow for first-party behavioral targeting where, for example, a general interest site can tag users as having read its finance pages and share this behavioral data when the user is browsing other types of content on its site.

Research can help answer: *How should advertisers leverage new targeting approaches?* We expect that FLoCs unbundle an audience into broad interest groups which can be useful for prospecting and training ad optimization models. FLEDGE interest groups can be used for retargeting, affiliate marketing, and behavioral targeting. Both FLoC and FLEDGE may improve the transparency and perhaps even the quality of behavioral ad segments that may be of questionable quality in the status quo (Neumann, et al. 2019). Researchers can also aid the development of proposed privacy-centric targeting approaches by benchmarking them against existing approaches (see e.g., Google Research and Ads 2020; Rouzard 2021). Seller-defined

audiences thus far have low adoption, but industry efforts to standardize the approach may unlock growth (IAB Tech Lab 2021).

2.3 Ad measurement

Digital advertising relies on cross-site/app identity to connect eyeballs (ad impressions) to wallets (user interactions with the advertiser). Nascent privacy-centric changes to advertising will further fracture the identity landscape. Advertisers will retain first-party user-level data, which advantages larger publishers and ad platforms. The largest, the so-called walled gardens, in particular will retain their substantial user data. Some advertisers may even begin selling within these walled gardens in order to preserve the ad measurement loop: e.g., some advertisers may embrace Facebook's seller marketplace post-ATT (Wagner 2021). Some cross-site/app identity will survive Apple and Google's changes, though its scale will be small. In particular, some users do consent to data-sharing even in opt-in consent regimes like Apple's ATT. Moreover, several ad tech firms are launching cross-site/app identity solutions that replace today's identifiers (e.g., Green 2021). For instance, users would sign in to websites using their email addresses (or other identifier), which in turn would be used as a new cross-site identifier.

Without cross-site/app identity, Apple & Google propose to centralize conversion tracking. As described above, advertisers must first coarsen their conversion space by defining discrete event types. Advertisers then receive reports from the centralized system on conversion events after a delay of at least a day. To protect privacy, advertisers receive either aggregate event counts or conversion-level events with a random delay rather than user-level data. In the future, these ad measurement systems may employ differential privacy and add privacy-preserving noise to conversion data. So far, Apple's SKAN instead employs (hidden) minimum conversion activity thresholds to generate reports.

The overarching question for the resulting research agenda is: *How should advertisers update and combine ad measurement methodologies?* Identity fragmentation creates biases in ad effectiveness estimates (Lin & Misra 2021). When advertisers lose user-level data, they lose the conversion-level attribution capabilities that have distinguished digital advertising. Advertisers must then fall back on macro-level ad measurement: aggregating by time, market, cohort, and/or channel. Advertisers will therefore return to media mix modeling (Runge and Seufert 2021), but will seek to combine this with other measurement approaches. Advertisers will want to validate these models with user-level data from panels of consenting users and with

experiments. Johnson (2021) outlines challenges and opportunities for privacy-centric ad experiments. Advertisers will need to attribute their conversions across siloed channels which each may contain user-level data that advertisers can access through data clean rooms. Advertisers will want to leverage user-level data from the consenting few to make real-time event-level predictions from a blend of consent user's event-level data and delayed, aggregate measurement. Advertisers may also look to panels of consenting users to provide a cross-site/app view of those users. Marketing researchers can lead the way ahead for practitioners and will need to adjust to the new measurement reality in their own research.

3. Conclusion

Though we have focused on pressing research questions facing digital advertisers, many more interesting questions for marketing researchers arise from privacy-centric changes to digital advertising. For instance, consumer behavior researchers may wonder: *How will consumers respond to ads with better privacy guarantees on the back end, but at best identical advertising on the front end?* And: *What mechanisms can, do, and should firms use to increase opt-in rates?* Analytical and quantitative researchers may wonder: *How will privacy-centric changes impact competition, firm profits, and consumer welfare?* We look forward to continued scholarly advancement in this fast-moving domain that is rewriting the rules of digital marketing.

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