Consent Management on the Web: UX Challenges and Engagement Opportunities

User Research[*]

A growing emphasis on user privacy and data protection is reshaping the design and distribution of digital news and information. Within these changing circumstances there exist opportunities to protect consumers and advance the business models of reputable online news sources. In fact, these two stakeholders have significantly aligned interests. The present exploratory laboratory study explores the use of a Firefox Plugin called Global Consent Manager on the level of engagement by consumers of news who are browsing reputable news sites to understand an extensive, unrecognized news issue. The results show that users of Global Consent Manager show higher levels of engagement that are statistically significant. We recommend a field study as a next step

Additional Key Words and Phrases: Privacy, data protection

1 INTRODUCTION

Two trends on the Internet are re-shaping the ability of users to control how their data is shared, involving both the sites they chose to use and with third parties of which they may be unaware. The first trend is new regulatory approaches. The European Union's General Data Protection Regulation (GDPR) ushers in a new age of individual rights protections on the Internet [1], including new requirements for obtaining consent for previously undisclosed personal data practices. The regulation of consent emerges from a period of unprecedented and public attention to the methods by which ways data generated about people and their online behavior is misused. Those taking part in the abuse include technology sector actors like Facebook, political actors like Cambridge Analytica [4] and deceptive online advertisers, many of which are engaged in activities such as identity theft and "click fraud" [1] Since the GDPR took effect in May 2018, other jurisdictions including India, California, and Brazil have enacted similar privacy laws or regulations.

The second trend in data regulation is a renewed emphasis on competition and differentiation by web browsers–both established and new browsers, including Apple Safari and Mozilla Firefox, have released new features designed to help users limit how their information is shared across the Internet. Browser privacy improvements are guided by research that shows broad user consensus on norms for data sharing across sites, and browsers are competing to best implement those user norms.

As a result of these trends, web users see promise for better protection for their personal data. The initial set of implementations for consent user experience, however, can present users with a confusing array of data sharing choices. This research focuses on the data consent required by GDPR, as presented by publisher sites

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[*]draft

[1]https://ec.europa.eu/commission/priorities/justice-and-fundamental-rights/data-protection/2018-reform-eu-data-protection-rules_en

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and consent management platforms (CMPs) with the intent of complying with GDPR, and not on previously proposed standards such as Platform for Privacy Preferences [3] and Do Not Track [5]. Most popular sites have deployed some kind of consent user experience to meet GDPR requirements.

Privacy choices, as presented by sites and CMPs, are widely understood to result in both poor user experience and inadvertent selection of options that do not match the user's privacy norms. This may because of misleading copy and design in consent interfaces, user fatigue, learned helplessness, or some mix of the three. The results of surveys on percentages of users expressing trust for particular Internet firms do not match the percentages expressing "consent" for tracking by those firms as captured by CMPs. This data tends to indicate that consent management user experience is failing to capture users' true preferences.

Consent experiences represent a new opportunity for sites trusted by users to work together with browsers that implement user data sharing controls, in order to both improve user experience and more accurately capture user preferences. We hypothesize that increasing user trust in data practices may increase engagement, as previous work shows that users running ad blockers have higher levels of web engagement. In a natural experiment on May 25, an alternate European version of the USA Today web site was released without tracking scripts or consent dialogs, probably because of a software schedule slip. The modified version outperformed the original site in both performance and engagement. This work builds on the ad blocking and USA Today natural experiments to test a deliberate intervention.

1.1 Publisher Sites Currently Have Inadequate Options

Improving the consent experience is a worthy goal for two reasons. Better capturing the user's actual data sharing preferences should give a trustworthy site a sustainable advantage over an untrusted site, and creating a less confusing user experience should pay off in increased engagement that can be measured in time on site and pageviews.

However, the options for purely server-side improvements are limited.

(1) Handle user consent correctly but manually. Sites end up with less personal data, but what they do have is better quality, with clear information about what data can be used for what purposes. The disadvantage of this method is increasing user experience burden from accurately capturing consent, by asking too many questions and tending to create a more stressful environment.
(2) Cut back on data collection. This is a business risk when many advertisers require user data.
(3) Use aggressively simplified consent workflows to keep doing surveillance marketing as usual. This is uncertain, especially as the client side improves privacy protections and a consent decision captured in an unclear way may not be respected by in-browser privacy tools.

There is another method to consider. This project aims to test the approach of involving the browser to help the user with the tedious work of setting the right consent bits, and provide a better experience than users can achieve manually. Global Consent Manager is a Firefox extension that implements and builds on existing consent standards. IAB Europe has published a cookie-based standard for consent, called GDPR Transparency and Consent Framework. Many of the permissions reflected in this new standard are already covered by existing preferences such as "Do Not Track," or can be determined from user behavior. A browser extension can fill in the necessary data in the cookie to reflect the user's privacy preferences, without asking the user to micromanage consent.

Although the storm of GDPR permission forms appears confusing, many of these acknowledgements involve a limited set of data and practices from a known set of third parties, and consent handling is becoming more uniform across sites. For example, Google and IAB are adopting the same standard. For cases they are involved in,, a tool that effectively manages the IAB consent system will also handle consent requests on sites using Google Tag Manager, which is used on a majority of ad-supported web sites. A single browser extension can handle

multiple sites' consent requests with few additional code changes, which makes client-side consent management practical.

We released a prototype browser extension that implements a new workflow for GDPR consent forms. On first visit to a site, the extension suppresses the display of the consent form, and writes a new, temporary consent string indicating "no consent." On a later visit the site can present its consent form, when the user has presumably decided that the site is trustworthy enough to continue interacting with. This new consent workflow is based on a common "growth hacking" pattern on social and collaboration sites. Sites typically build user profiles incrementally, starting with just enough data to authenticate the user on return, and get them started using the site. As users invest more time in the site, it will prompt them to fill in more and more profile information (LinkedIn is a good example.).

Until now, news sites take a less sophisticated approach. Instead of trading value for information incrementally, users are presented with a comprehensive dialog asking them for extensive consent up front. Will the incremental approach that applies to data collection for social and collaboration sites also apply to news sites?

Avoiding reflexive denial of data collection practices that match the user's norms is a key goal. We will design the extension to facilitate users making an appropriate choice when sites they trust make a request for consent. We delivered and evaluated a browser extension. Currently the browsers can compete to do their own versions, in order to give their users a more trustworthy and less annoying experience. Browsers need to differentiate in order to attract new users and retain existing users. Right now, a good way to do that is in creating a safer-feeling, more trustworthy environment.

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1.2 Related Mozilla Technology or Program

This is project is important to Mozilla's ongoing tracking protection development work, and complements in-house development in Firefox. Browsers are currently under pressure to give users a web experience that is both safer and less time-consuming. Mozilla seeks to give users a set of protection technologies that are consistent with its values and that reflect the results of real-world testing.

(1) Expand the set of user protection technologies that Firefox product management could choose as the default.
(2) Communicate with advertisers, publishers, and Internet companies about our values and capabilities.
(3) Build consultative process to understand and act on publisher values and interests to help set priorities for browser behavior.
(4) Set appropriate defaults will depend on making the right information available.

Mozilla is placing a new emphasis on encouraging independent developers to implement and test privacy techniques, especially as part of combined filtering approaches. If successful, Global Consent Manager will be available for Firefox product management for further testing, such as research with Firefox users as a Shield study. This work is an example of independently operated user research that can feed into Mozilla's values-centered and data-driven approach to better browser privacy.

2 METHODS

To assess the effects of Global Consent Manager on user engagement with news oriented websites we conducted a pilot user study using 12 subjects in a lab study. Since our study was conducted in the US, we installed "FoxyProxy" [2], using a server identity in Germany, to simulate the experience of a European user. Subjects were then given the following directives:

(1) The purpose of this study is to understand how users experience news and information websites using different browser configurations.
(2) Your Task: Find out the background, context, and involved organizations and people in stories about "Jamal Khashoggi". Also, what is his profession? At the end of your web research, we are going to ask you to discuss your feelings and what you understand about this individual after doing web research.
(3) You have a choice of going to all of these websites, or just 3 of them to get information about the question in step 1:
  (a) https://bbc.com
  (b) https://dailymail.co.uk
  (c) https://independent.co.uk
  (d) https://theguardian.co.uk
  (e) https://worldcrunch.com
  (f) https://www.mediapart.fr/en/english
(4) For each website you visit:
  (a) Bookmark information related to news item that you think you might want to refer to later (assume you have a level of interest)
  (b) Make hand written notes on paper about 3 individuals and 2 organizations that play a role in the news item, and summarize each person's and each organization's role.

3 RESULTS

Engagement on news websites is what our user study evaluated. Do users with Global Consent Manager spend more time on news and information websites than users without global consent management? In short, the answer is "yes". The 12 users we ran through the protocol described in our methods section show statistically significant differences, with Global Consent Manager users spending a mean of 1198s and a standard deviation of 488. The control group's mean was 734s with a standard deviation of 202. We performed Tukey and Welch t-tests, with the p-value on the Welch test being 0.079. A section of the R code and salient outputs is shown below.

```
> t.test(gsm2$Seconds ~ gs$Group)

Welch Two Sample t-test

data:  gsm2$Seconds by gsm2$Group
t = -2.1227, df = 6.9105, p-value = 0.07195

alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
-983.44925   54.31591

sample estimates:
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[2] https://www.foxyproxy.com

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mean in group  control    mean in group  treat
733.600                    1198.167

> TukeyHSD(aov(Seconds ~ gsm2$Group, gsm2))
Tukey multiple comparisons of means
95% family-wise confidence level
Fit: aov(formula = Seconds ~ gsm2$Group, data = gsm2)

$`gsm2$Group`
diff      lwr       upr       p adj

treat- control 464.5667 -66.93345 996.0668 0.0794069
```

The difference between control and treatment is illustrated with discrete points as well as color coded indications of the range in each case in the next figure. We can clearly see that Global Consent Manager users are engaged on news websites for longer periods of time in this study.

Fig. 1. The distribution of engagement times between the treatment and control groups show a statistically significant difference. This figure illustrates the distribution visually
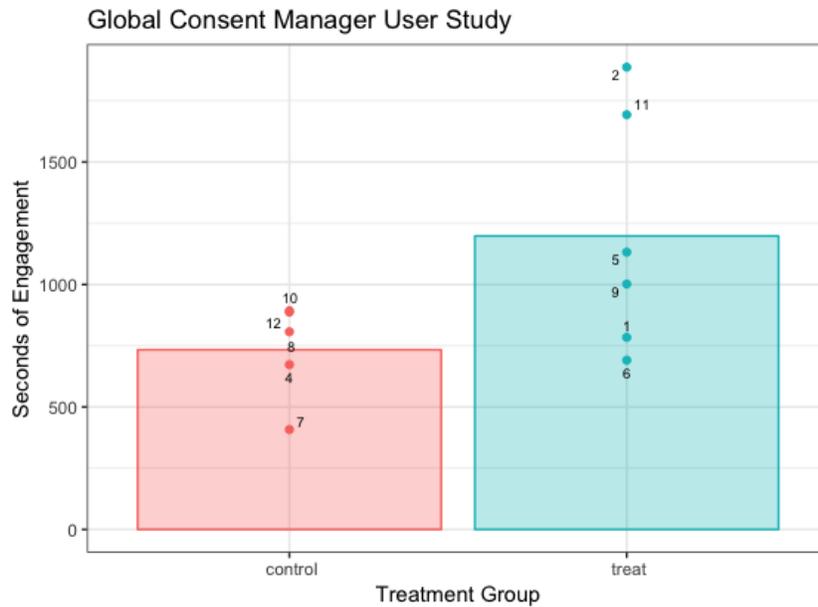
4 DISCUSSION AND NEXT STEPS

Our lab experiment shows promise for increasing engagement with reputable online news organizations by helping users manage their privacy in accordance with GDPR and similar regulations. A larger field study, such as a Mozilla Shield study is, we believe, an appropriate the next step, much like similar studies of engagement that showed earlier promise in the past [2].

5 ACKNOWLEDGEMENTS

6 APPENDIX A: TEAM BACKGROUND

6.1 Researcher Bios with Links to Existing Work

Dr. Sean Goggins is an active technology mediated community researcher with a focus on applying a rich collection of machine learning and social network analysis methods to uncover patterns human action on social platforms like GitHub. The results of his analysis include hundreds of computational models used to indicate levels of learning, community health, performance, discussion trajectory and collaborative. The National Science Foundation, Alfred P. Sloan Foundation, Office of Naval Research, Department of Education, the Enterprise Foundation, and MD Consult have funded his research in this area. Finally, Sean is an accomplished Computer Supported Cooperative Work, Small Group and Social Informatics Researcher, including winning best paper awards for his work in gaming analytics design (2010) and the systematic application for trace data for learning in Information Technology and People (2011). Relevant work includes:

(1) CHAOSS Project founding member: https://wiki.linuxfoundation.org/oss-health-metrics
(2) Open Source Health Metrics on GitHub: http://bit.ly/2pXVvHl
(3) Performance and Participation on GitHub: http://bit.ly/2pY1r2T
(4) Structural Fluidity in Open Source Software Projects: http://bit.ly/2qTa9EA
(5) Building Social Computing Theory: http://bit.ly/2qT7TgB

7 UNIVERSITY OF MISSOURI OPEN COMMUNITY HEALTH AND SUSTAINABILITY LAB (AUGURLABS)

The open community health and sustainability lab is focused on building metrics and indicators that help contributors, participants and managers develop awareness how the open communities they contribute to are doing. Our main focus is an integration of social, computational and visual representations of a) which factors related to health and sustainability of open organizations are important for understanding their health and trajectory and b) how to measure the qualitative and quantitative evolution of those indicators over time. *Current Projects*: AugurLabs is actively engaged in a Sloan Foundation funded project to develop open source project health and sustainability metrics through a Linux Foundation working group we helped form, "CHAOSS" (Community Health and Open Source Sustainability), an NSF Funded project focused on building an open collaboration data exchange, and analytics to make sense of student learning and progress in games for learning (Mission Hydro Sci). In all cases we are doing engaged field research, building software and disseminating results through publications and speaking engagements. *The Team*: Our team is composed of, at any given time, 4-6 undergraduate software developers, 2-3 Ph.D students, and 2-3 university faculty. Our undergraduates focus on building usable software that's deployed in the wild, for public use. Our graduate students and faculty make design, code and documentation contributions to those projects, in addition to creating blog posts, academic papers and public presentations. *Software Development Capabilities*: Our six undergraduates are engaged in competitions at the Reynolds Journalism Institute at the University of Missouri in addition to projects in our lab. The technologies we use include Python, Full Stack NodeJS, R, and graph database technologies. You can learn more about our work through the GitHub repositories at:

(1) https://www.github.com/CHAOSS

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[3]http://www.rjionline.org

(2) https://www.github.com/OSSHealth
(3) http://augur.software
(4) http://augurlabs.io
(5) http://chaoss.community
(6) http://www.sociallycompute.io
(7) http://mhs.missouri.edu
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