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An Empirical Analysis of Data Deletion and Opt-Out Choices on 150 Websites

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Abstract

Many websites offer visitors privacy controls and opt-out choices, either to comply with legal requirements or to address consumer privacy concerns. The way these control mechanisms are implemented can significantly affect individuals' choices and their privacy outcomes. We present an extensive content analysis of a stratified sample of 150 English-language websites, assessing the usability and interaction paths of their data deletion options and opt-outs for email communications and targeted advertising. This heuristic evaluation identified substantial issues that likely make exercising these privacy choices on many websites difficult and confusing for US-based consumers. Even though the majority of analyzed websites offered privacy choices, they were located inconsistently across websites. Furthermore, some privacy choices were rendered unusable by missing or unhelpful information, or by links that did not lead to the stated choice. Based on our findings, we provide insights for addressing usability issues in the end-to-end interaction required to effectively exercise privacy choices and controls.

1 Introduction

The dominant approach for dealing with privacy concerns online, especially in the United States, has largely centered around the concepts of notice and consent [56]. Along with transparency, consumer advocates and regulators have asserted the need for consumers to have control over their personal data [22, 28, 41]. This has led some websites to offer privacy choices, such as opt-outs for email communications

or targeted ads, and mechanisms for consumers to request removal of their personal data from companies' databases.

Despite the availability of privacy choices, including mechanisms created by industry self-regulatory groups (e.g., the Digital Advertising Alliance [21]) as well as those mandated by legislation, consent mechanisms appear to have failed to provide meaningful privacy protection [15, 57]. For example, many consumers are unaware that privacy choice mechanisms exist [33, 48, 60]. Additionally, past research has identified usability and noncompliance issues with particular types of opt-outs, such as those for email communications and targeted advertising [24, 35, 40, 42, 55]. Our study builds on prior work by contributing a large-scale and systematic review of website privacy choices, providing deeper insight into how websites offer such privacy choices and why current mechanisms might be difficult for consumers to use.

We conducted an in-depth content analysis of opt-outs for email communications and targeted advertising, as well as data deletion choices, available to US consumers. Through a manual review of 150 English-language websites sampled across different levels of popularity, we analyzed the current practices websites use to offer privacy choices, as well as issues that may render some choices unusable. Our empirical content analysis focused on two research questions:

1. What choices related to email communications, targeted advertising, and data deletion do websites offer?
2. How are websites presenting those privacy choices to their visitors?

We found that most websites in our sample offered choices related to email marketing, targeted advertising, and data deletion where applicable: nearly 90% of websites that mentioned using email communications or targeted advertising in their privacy policy provided an opt-out for that practice, and nearly 75% offered a data deletion mechanism. These choices were provided primarily through website privacy policies, but were often also presented in other locations. Furthermore, our heuristic evaluation revealed several reasons why people may find these choices difficult to use and understand. In over 80% of privacy policies analyzed, the policy text omit-

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ted important details about a privacy choice, such as whether a targeted advertising opt-out would stop all tracking on a website, or the time frame in which a request for account deletion would be completed. Though a less frequent occurrence, some policies contained opt-out links that direct the user to a page without an opt-out, or referred to non-existent privacy choices. We further observed a lack of uniformity in the section headings used in privacy policies to describe these choices. Compounded, these issues might make privacy choices hard to find and comprehend.

New regulations, such as the European Union’s General Data Protection Regulation (GDPR) and California’s Consumer Privacy Act (CCPA), aim to address issues with privacy choice mechanisms and include strict requirements for obtaining and maintaining consent for practices like direct marketing, targeted advertising, and disclosure or sale of personal data [25, 50]. Our study contributes a better understanding of the mechanisms websites currently use to provide choices related to these practices, and where they may fall short in helping people take advantage of available choices. Additionally, our analysis provides a foundation for future research into the development of best practices for provisioning privacy choices. These recommendations could build upon changes to the consent experience in the mobile app domain, where research showing the benefits of a uniform interface contributed to changes in permission settings implemented by the Android and iOS platforms [4]. Building new approaches for privacy choice provisioning upon practices that are already prevalent may increase the likelihood of adoption.

2 Privacy Choice Regulatory Framework

As background, we provide an overview of current legislation and industry self-regulatory guidelines related to the types of privacy choices evaluated in this study: opt-outs for email and targeted advertising and options for data deletion.

2.1 Opt-outs for Email Communications

In the United States, the Controlling the Assault of Non-Solicited Pornography and Marketing (CAN-SPAM) Act of 2003 established national standards for companies that send electronic commercial messages to consumers [29]. It requires companies to provide consumers with a means to opt out of receiving communications, accompanied by a clear and noticeable explanation about how to use the opt-out. Once the commercial message is sent, opt-outs must be available to recipients for at least 30 days, and any opt-out request must be honored within 10 business days. The European Union’s General Data Protection Regulation (GDPR) also grants consumers “the right to object” when their personal data is processed for direct marketing purposes (Art. 21) [25]. Furthermore, the California Consumer Privacy Act (CCPA), which will go into effect in 2020, grants California residents

the right to opt out of having their personal data sold to third parties, such as for marketing purposes [50].

2.2 Opt-outs for Targeted Advertising

Since the early 2000s, industry organizations in the United States and Europe — including the Network Advertising Initiative (NAI), Digital Advertising Alliance (DAA), and Interactive Advertising Bureau Europe (IAB Europe) — have adopted principles and self-regulatory requirements related to practices used in online behavioral advertising [21, 38, 52]. DAA member advertisers are required to provide consumers with the choice to opt out of tracking-based targeted advertising [21]. This requirement applies to data used by the company or transferred to other non-affiliated entities to deliver tailored ads, but not for other collection purposes [46].

The GDPR emphasizes consumers’ consent to the processing of their personal data for purposes that go beyond what is required to fulfill a contractual obligation or immediate business interests. In asking for consent, websites should present a clear, affirmative action, and ask visitors for agreement rather than incorporating the consent into default settings, such as pre-checked boxes (Art. 4). Consent should be in an easily accessible form, using simple, clear language and visualization, if needed; if the consumer is a child, the language must be understandable by a child (Art. 12). Moreover, visitors are allowed to withdraw their consent at any time (Art. 7). Nevertheless, the GDPR does not explicitly state that consent is required for targeted advertising, and ambiguity in Art. 6 may provide leeway for companies to claim a “legitimate business interest” and collect data for targeted advertising without obtaining explicit consent [25].

2.3 Data Deletion Choices

The GDPR also grants consumers whose data is collected in the European Union the “right to be forgotten.” This stipulates that under certain circumstances, companies must comply with consumer requests to erase personal data (Art. 17) [25]. Implementations of the “right to be forgotten” vary from account deletion request forms to the ability of consumers to delete certain information related to their profile.

While no general “right to be forgotten” exists in the United States, some US federal laws contain data deletion requirements for specific contexts. The Children’s Online Privacy Protection Act of 1998 (COPPA), for example, requires online services that collect personal information of children under 13 years old to delete it upon parental request [30]. The CCPA will also give California residents the right to request their personal data be deleted, except in certain circumstances, such as when the information is needed to complete an unfinished transaction [12].

3 Related Work

Our study builds upon prior work that (1) evaluated privacy control mechanisms; and (2) studied consumer attitudes and behaviors related to data collection and use.

3.1 Prior Evaluations of Privacy Choices

The usability of websites' privacy communications and controls has long been problematic [47, 48]. Recent work has shown that privacy policies still exhibit low readability scores [26, 44]. Additionally, most websites fail to provide specific details regarding the entities with which they share data and the purposes for which data is shared [34]. Some consumer advocates argue that current control mechanisms nudge people away from exercising their right to privacy with practices, such as creating a cumbersome route to privacy-friendly options, highlighting the positive outcome of privacy-invasive options, and incentivizing consumers to share more personal data through the framing of control mechanisms [54].

Prior studies have also revealed compliance issues related to privacy control requirements. For example, in the early 2000s the Federal Trade Commissions (FTC) found that privacy controls were not ubiquitously implemented at that time, with only 61% of surveyed websites giving consumers options regarding the collection of their personal information [27]. There is also evidence of noncompliance with the GDPR, as some major websites still deliver targeted ads to European visitors who did not consent to the use of their personal data [19].

However, it seems that companies are adjusting their privacy notice and control mechanisms in response to new legal requirements. Degeling et al. found that, among the more than 6,000 European websites surveyed in 2018, 85% had privacy policies; many websites had updated their privacy policies or started to display cookie consent notices when the GDPR went into effect, likely in response to the GDPR's transparency requirements [20]. Yet, it is unclear whether the changes websites are implementing actually serve to protect consumers. Facebook, for example, was criticized for their post-GDPR privacy changes, as users are still not able to opt out of Facebook's use of behavioral data to personalize their News Feeds or optimize its service [13].

Our analysis primarily focuses on usability issues and does not intend to analyze legal compliance (although the latter is an important direction for future work). Next we highlight key findings of prior usability evaluations regarding email communication opt-outs, targeted advertising opt-outs and data deletion choices, the three types of privacy choices on which our analysis is focused. Our study is the first to survey all three forms of privacy choices in a comprehensive manner through content analysis. Our findings provide an overview of current practices and potential usability pitfalls, with ample implications for making privacy choice mechanisms more uniform and apparent across websites.

3.1.1 Evaluation of Email Communication Opt-outs

Due to the CAN-SPAM Act, many websites offer consumers control over which email messages they receive. An audit of top North American retailers in 2017 by the Online Trust Alliance found that 92% of websites surveyed offered unsubscribe links within messages. However, the study also revealed that compliance issues still exist as some retailers offered broken unsubscribe links, or continued to send emails after the 10-business-days deadline [55]. A 2018 analysis by the Nielsen Norman group revealed usability issues related to unsubscribe options in marketing emails, such as inconspicuous links without visual cues indicating that they are clickable, long and complicated processes involving many check boxes and feedback-related questions prior to the final unsubscribe button, as well as messaging that might annoy or offend users [53]. Our research complements these studies by examining usability issues occurring in unsubscribe mechanisms offered on websites rather than through emails, such as links in privacy policies and account settings.

3.1.2 Evaluation of Targeted Advertising Opt-outs

Existing opt-out tools for targeted advertising include third-party cookie blockers built into web browsers, browser extensions, and opt-out tools provided by industry self-regulatory groups. The effectiveness of these tools varies. Many opt-out options, for example, prevent tailored ads from being displayed but do not opt users out of web tracking [8]. A 2012 study found certain browser extensions and cookie-based tools to be helpful in limiting targeted text-based ads, but the "Do Not Track" option in browsers was largely ineffective [6, 31].

Prior evaluations of targeted advertising opt-out tools have revealed numerous usability issues that can impose a heavy burden on users. For instance, using opt-out cookies is cumbersome, as these cookies need to be manually installed and updated, and may be inadvertently deleted [46]. Browser extensions partially mitigate these issues but introduce other problems. Leon et al. found in 2012 that descriptions of browser extensions were filled with jargon, and participants were not effectively prompted to change their settings when the tool interfered with websites [42]. Some of these tools have since been updated to address usability concerns. Opt-out tools offered by industry self-regulatory groups also exhibit low comprehension, as studies have found that the NAI's description of opt-out cookies led to the misinterpretation that the opt-out would stop all data collection by online advertisers, and DAA's AdChoices icon failed to communicate to web users that a displayed ad is targeted [48, 60]. Moreover, when the AdChoices icon is presented on a mobile device, it tends to be difficult for people to see [33].

Furthermore, studies have identified issues related to non-compliance with self-regulatory guidelines for targeted advertising. Hernandez et al. found in 2011 that among Alexa's US top 500 websites only about 10% of third-party ads used

the AdChoices icon, and even fewer used the related text [35]. Similar noncompliance issues with the enhanced notice requirement were found by Komanduri et al. in a large-scale examination of DAA and NAI members [40]. In 2015, Cranor et al. reported that privacy policies of companies who use targeted advertising did not meet self-regulatory guidelines related to transparency and linking to personally identifiable information [16]. Our analysis complements this prior work by further highlighting practices used by websites that could make advertising opt-outs difficult to use or comprehend.

3.1.3 Evaluation of Data Deletion Choices

Comparatively, there have been fewer evaluations of data deletion mechanisms, likely due to the recency of corresponding legal requirements. The Global Privacy Enforcement Network (GPEN) reported that only half of the websites and mobile apps they evaluated provided instructions for removing personal data from the company's database in the privacy policy, and only 22% specified the retention time of inactive accounts [34]. An encouraging effort is the JustDelete.me database,¹ which rated the account deletion process of 511 web services. More than half of the websites analyzed (54%) were rated as having an "easy" process for deleting an account from the website. Yet, these ratings only apply to the specific action required to use deletion mechanisms and do not systematically analyze the full end-to-end interaction, which also includes finding and learning available mechanisms and assessing the result of the action, as we do in our study.

3.2 Programmatic Privacy Choice Extraction

Recent efforts in analyzing opt-out mechanisms have utilized automated extraction tools and machine learning. Such tools have been used to evaluate the privacy policies of US financial institutions [17] and descriptions of third-party data collection in website privacy policies [43]. Machine learning classifiers developed by Liu et al. have successfully been used to annotate privacy policy text for certain practices [45]. More directly related to privacy choice mechanisms, Sathyendra et al. and Wilson et al. developed classifiers to identify opt-out choices and deletion options in the privacy policies of websites and mobile apps [58, 62]. Ultimately, these techniques demonstrate the prospect of building tools to extract privacy choices buried in the long text of privacy policies to present them in a more user-friendly manner. However, our manual in-depth analysis of how these choices are presented by websites can identify issues and inform the design of consent mechanisms that better meet users' needs.

¹ <https://backgroundchecks.org/justdeleteme/>

3.3 Consumer Attitudes and Behavior

Prior studies have shown that consumers are uncomfortable with certain data handling practices commonly used by websites. For example, in a survey conducted by Business Week and Harris Poll in 2000, 78% of respondents were concerned that companies would use their information to send junk emails [9]. Similarly, in another 1999 survey, 70% of respondents wanted to have the choice to be removed from a website's mailing list [18]. More recently, Murillo et al. examined users' expectations of online data deletion mechanisms and found that users' reasons for deleting data were varied and largely depended on the type of service, posing difficulties for a uniform deletion interface adaptable for all services [51].

Most prior work on consumer attitudes and behavior in this area has focused on targeted advertising practices. Internet users consider targeted advertising a double-edged sword: targeted advertising stimulates purchases and is favored by consumers when it is perceived to be personally relevant; yet, it also raises significant privacy concerns due to the large amount of personal data being collected, shared, and used in a nontransparent way [7, 39]. Prior research has shown rich evidence of consumers' objection to data collection for targeted advertising purposes. In Turov et al.'s 2009 national survey, over 70% of respondents reported that they did not want marketers to collect their data and deliver ads, discounts, or news based on their interests [59]. Similarly, in McDonald and Cranor's 2010 survey, 55% of respondents preferred not to see interest-based ads, and many were unaware that opt-out mechanisms existed [48]. These findings are supported by qualitative work, such as Ur et al.'s 2012 interview study in which participants generally objected to being tracked [60].

Despite significant privacy concerns, consumers struggle to protect their online privacy against targeted advertising for multiple reasons [14, 42]. Two aspects that limit users' capabilities in dealing with targeted advertising include the asymmetric power held by entities in the targeted advertising ecosystem, and consumers' bounded rationality and limited technical knowledge to fully understand and utilize privacy-enhancing technologies [1, 3, 24]. For example, many consumers may not know that ads they see may be based on their email content [48]. Yao et al. showed that mental models about targeted advertising practices contain misconceptions, including conceptualizing trackers as viruses and speculating that trackers access local files and reside locally on one's computer [63]. These findings highlight the importance of improving the usability of opt-out tools and disclosures of data handling practices, as well as enhancing consumer education.

4 Methodology

We developed an analysis template for the systematic analysis of data deletion, email, and targeted advertising choices offered by websites along multiple metrics. Our analysis in-

cluded websites sampled across different ranges of web traffic that were registered primarily in the United States.

4.1 Template for Analysis

We implemented a comprehensive template in Qualtrics to facilitate standardized recording of data for researchers' manual content analysis of websites. For the purpose of our analysis, we defined opt-outs for email communications as mechanisms that allow users to request that a website stop sending them any type of email message (e.g., marketing, surveys, newsletters). Any mention of an advertising industry website or opt-out tool, as well as descriptions of advertising-related settings implemented by the website, browser, or operating system (e.g., "Limit Ad Tracking" in iOS) was considered as an opt-out for targeted advertising. We identified data deletion mechanisms as a means through which users can delete their account or information related to their account, including via an email to the company.

In completing the template, a member of the research team visited the home page, privacy policy, and account settings of each website examined, and answered the relevant template questions according to the privacy choices available. For each choice identified, we recorded where the privacy choice is located on the website, the user actions required in the shortest path to exercise the choice, and other information about the choice provided by the website. To complete the template, researchers were asked to:

1. Visit the homepage of the website.
2. Note if there was a notice to consumers regarding the use of cookies on the website.
3. Create a user account for the website using an alias and email address provisioned for this analysis.
4. Review any targeted advertising opt-outs on a page linked from the homepage that describes advertising practices (i.e., an "AdChoices" page).
5. Visit the website's privacy policy.
6. Review any email communications in the privacy policy.
7. Review any targeted advertising opt-outs in the policy.
8. Review any data deletion mechanisms in the policy.
9. Note whether the privacy policy mentions Do Not Track.
10. Note any other privacy choices in the privacy policy and linked pages providing privacy information.
11. Review any email communications opt-outs in the user account settings.
12. Review any targeted advertising opt-outs in the user account settings.
13. Review any data deletion mechanisms in the user account settings.
14. Note any other privacy choices in the account settings.

At every stage, researchers also made note of practices for offering privacy controls that seemed particularly detrimental or beneficial to usability throughout the Interaction Cycle, a

framework for describing the end-to-end interaction between a human and a system [5].

To refine the template, our research team conducted six rounds of pilot testing with 25 unique websites from Amazon Alexa's² ranking of top 50 US websites. For every round of piloting, two researchers independently analyzed a small set of websites. We then reconciled disagreements in our analysis, and collaboratively revised the questions in the template to ensure that there was a mutual understanding of the metrics being collected.

4.2 Website Sample

We examined 150 websites sampled from Alexa's ranking of global top 10,000 websites (as of March 22, 2018). To understand how privacy choices vary across a broad range of websites, we categorized these websites based on their reach (per million users), an indicator of how popular a website is, provided by the Alexa API. We selected two thresholds to divide websites and categorized them as: *top websites* (ranks 1 - 200), *middle websites* (ranks 201 - 5,000), and *bottom websites* (ranks > 5,000). These thresholds were identified by plotting websites' reach against their rank, and observing the first two ranks at which reach leveled off. Our analysis included 50 *top*, 50 *middle*, and 50 *bottom* websites randomly selected from each range. We stratified our sample as such, since consumers may spend significant time on websites in the long tail of popularity. The stratified sample enables us to understand the privacy choices provided on low-traffic websites, and how they differ from choices on popular websites.

The ICANN "WHOIS" record of 93 websites in our sample indicated registration in the United States, while other websites were registered in Europe (26), Asia (11), Africa (4), Central America/the Caribbean (2), or contained no country related information (14). In constructing our sample, we excluded porn websites to prevent researchers' exposure to adult content. To simplify our data collection, we also excluded a handful of websites drawn during our sampling that required a non-email based verification step, or sensitive information like a social security number (SSN) or credit card, to create a user account. Due to the language competencies of the research team, we only included websites written in English, or those with English versions available. All websites included in our study were analyzed between April and October 2018. Data collected from our pilot rounds are not included in our analysis. The types of websites included in our sample ranged from popular news and e-commerce websites to university and gaming websites.

Due to the GDPR, many websites were releasing new versions of their privacy policies during the period of our data analysis. In October 2018 we reviewed all websites in our dataset that had been analyzed prior to May 25, 2018, the GDPR effective date, and conducted our analysis again on

²Amazon Alexa Top Sites: <https://www.alexa.com/topsites>

the 37 websites that had updated their privacy policy. Our reported findings are primarily based on the later versions of these policies, but we also compared the pre- and post-GDPR versions for these websites, and highlight differences.

4.3 Data Collection

The researchers involved in data collection went through a training process during which they completed the template for several websites prior to contributing to the actual dataset. To ensure thorough and consistent analysis, two researchers independently analyzed the same 75 (50%) websites sampled evenly across categories. Cohen's Kappa ($\kappa = 0.82$) was averaged over the questions in which researchers indicated whether or not privacy choice mechanisms were present on the page being analyzed. All disagreements in the analysis were reviewed and reconciled, and the remaining 75 websites were coded by only one researcher. Analyzing one website took 5 to 58 minutes, with an average of 21 minutes spent per website. This variance in analysis time was related to websites' practices. For example, websites that did not use email marketing or targeted advertising could be reviewed more quickly. To prevent browser cookies, cookie settings, or browser extensions from affecting website content, researchers collected data in Google Chrome's private browsing mode, opening a new browser window for each website.

4.4 Limitations

The privacy choices we reviewed may not be representative of all websites. Our sample only included English-language websites, which may not be reflective of websites in other languages. We also only included websites from Alexa's top 10,000 list. Websites with lower rankings may exhibit a different distribution of choices than that observed in our sample. Moreover, in the process of random sampling, we excluded a small number of websites, primarily for financial institutions, that required sensitive personal information (e.g., SSN or credit card) for account registration. Considering the sensitive nature of this type of personal information, these websites may offer privacy choices through different means or offer other choices. However, our sample still includes many websites that collect credit card information and other sensitive personal information, but do not require it for account creation. Despite these exclusions, we are confident the websites we analyzed provide broad coverage of websites' most prominent practices for offering opt-outs and deletion mechanisms.

Additionally, since our analysis was conducted using US IP addresses, we may not have observed privacy choices available to residents of other jurisdictions (such as the EU) with other legal privacy requirements. Our analysis thus only reflects privacy choices available to US-based consumers.

Lastly, our study cannot provide definite conclusions about how consumers will comprehend and utilize the privacy choices we analyzed. We chose a content analysis approach in order to be able to gain a systematic overview of current practices in provisioning opt-out choices, which was not provided by prior work at this scale. Nonetheless, based on prior opt-out evaluations and design best practices, we hypothesize that certain design choices (e.g., multiple steps to an opt-out choice) will appear difficult or confusing to users. Our findings also surface many other issues that pose challenges to consistent privacy choice design. The effects of these issues on consumers could be studied in future work.

5 Results

Our manual content analysis of 150 websites revealed that privacy choices are commonly available, but might be difficult to find and to comprehend. We identified several factors that likely negatively impact the usability of privacy choices, such as inconsistent placement, vague descriptions in privacy policies, and technical errors.

5.1 Overview of Privacy Policies

Nearly all of the websites in our sample included a link to a privacy policy from the home page. The only websites that did not include a privacy policy were three bottom websites. Of the 147 policies analyzed, 15% (22) were a corporate policy from a parent company. In line with prior findings, comprehension of the text that describes privacy choices requires advanced reading skills [26]. However, about a third of policies in our analysis adopted tables of contents to present the information in a structured way, or linked to separate pages to highlight particular sections of the policy.

Privacy choices text has poor readability. For websites in our sample that had a privacy policy, we recorded the policy text and marked out the portions that described privacy choices. We then conducted a readability analysis using the text analysis service readable.io.

As reported in Table 1, the Flesch Reading Ease Scores (FRES) for text related to email opt-outs, targeted advertising opt-outs, and data deletion choices received means and medians of about 40 on a 0 to 100 point scale (with higher scores indicating easier-to-read text) [32]. The analyzed text for all three types of privacy choices on the Flesch-Kincaid Grade Level (FGL), a grade-based metric, had means and medians around 13, which implies the text requires the audience to have university-level reading abilities. On Flesch's 7-level ranking system, over 90% of the analyzed privacy choices were described in text that was "very difficult," "difficult," or "fairly difficult" to read.

Privacy policies as a whole had better, but not ideal, readability, compared to privacy choice text: our analyzed privacy

	Flesch Reading Ease		Flesch-Kincaid	
	Mean	SD	Mean	SD
Email Comm.	39.54	13.55	13.89	3.40
Targeted Adv.	39.38	15.41	13.72	4.48
Data Deletion	38.98	17.89	14.28	5.40
Privacy Policies	45.80	10.72	10.20	2.44

Table 1: Readability scores for privacy policy text describing email opt-outs, advertising opt-outs, and deletion choices.

policies had a mean FRES of 45.80 and a mean FGL of 10.20, which align with prior readability evaluations of privacy policies, both across domains [26] and for particular categories (e.g., social networking, e-commerce, and healthcare websites [23, 49]). Nevertheless, literacy research suggests materials approachable by the general public should aim for a junior high reading level (i.e., 7 to 9) [36]. These statistics of our analyzed privacy policies and text related to privacy choices, which were all post-GDPR versions, suggest that most of them still fail to comply with the GDPR’s “clear and plain language” requirement, a key principle of transparency.

Some websites use table of contents and support pages.

We also observed that a significant portion of the policies in our sample were organized using a table of contents. Of the 147 privacy policies, 48 (33%) included a table of contents, which provides a road map for users to navigate a policy’s sections. Additionally, 53 (36%) policies linked to secondary pages related to the company’s privacy practices. For example, Amazon and Dropbox have individual pages to explain how targeted advertising works and how to opt-out.

5.2 Presence of Privacy Choices

In this section, we first focus on whether and where choices were present on the websites analyzed. More details about how these choices are described in policies are presented in Section 5.3. We found that privacy choices are commonly offered across all three website tiers. Beyond privacy policies, websites often provide opt-outs and data deletion choices through other mechanisms, such as account settings or email.

Privacy choices are prevalent. All three types of privacy choices were prevalent in our sample. As seen in Table 2, 89% of websites with email marketing or targeted advertising offered opt-outs for those practices, and 74% of all websites had at least one data deletion mechanism. The location of privacy choices across top, middle, and bottom websites is displayed in Figure 1. Top websites were found to provide more privacy choices than middle and bottom websites.

	Email Comm.	Targeted Adv.	Data Deletion
# of sites applicable	112	95	150
# of sites choice present	100	85	111
% of applicable sites	89%	89%	74%

Table 2: Summary of the availability of each type of privacy choice and websites on which they are applicable.

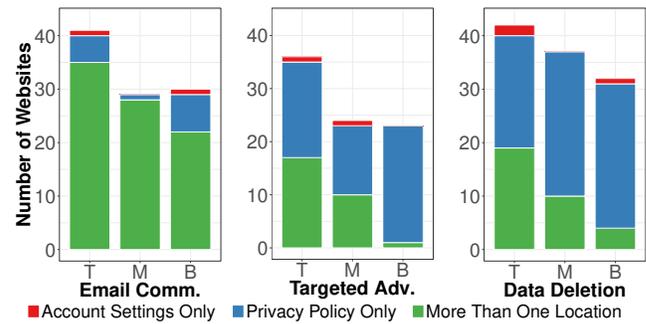


Figure 1: Location of privacy choices for top, middle, and bottom websites. Top websites offered the most privacy choices.

Email opt-outs were links in policies and emails. Most often, opt-outs for email communications were offered in multiple ways. Nearly all (98 of 100) websites offering email communication opt-outs presented the opt-out for emails in the privacy policy; however, only 31 policies included a direct link to the opt-out page, while 70 stated that users could unsubscribe within emails. Additionally, 51 websites had an opt-out in the account settings, the majority of which (33) lead to the same opt-out described in the privacy policy, and 15 websites provided a choice for email communication during account creation.

Advertising opt-outs were links in privacy policies. Websites primarily used their privacy policy to provide opt-outs for targeted advertising. Of 85 websites that offer at least one targeted advertising opt-out, 80 provided them in the privacy policy. Among them, 74 also provided at least one link, while the remaining just described an opt-out mechanism with text, such as “. . . you can opt out by visiting the Network Advertising initiative opt out page.” However, 58 websites had multiple links leading to different opt-out tools, which may cause confusion about which tool visitors should prioritize and what the differences are.

On 26 websites, an “AdChoices” page linked from the homepage described the website’s advertising practices and presented opt-out choices. Among them, 15 used text containing the words “ad choices” to refer to the page; others labeled the page as “interest-based ads,” “cookie information” or “cookie policy.” Additionally, 12 websites included opt-

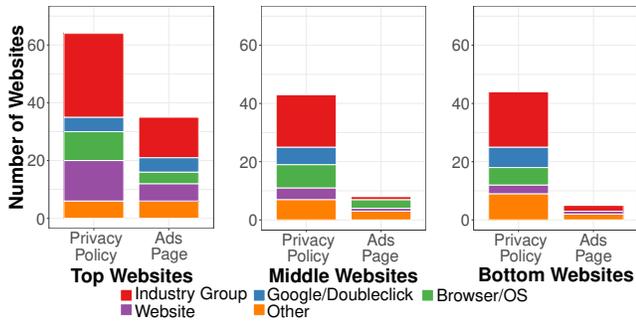


Figure 2: Distribution of different types of targeted advertising opt-outs in privacy policies and “About Ads” pages across top, middle, and bottom websites.

outs in the user account settings, 11 of which led to the same opt-out page presented in the policy.

As seen in Figure 2, many websites referred to opt-out tools provided by advertising industry associations. However, 27% of opt-out links pointing to the DAA or NAI directed visitors to their homepages, instead of their opt-out tools. This creates a substantial barrier for people to opt-out because visitors still need to find the appropriate opt-out tool on the DAA and NAI websites. Conversely, 21 of 22 links to the European Interactive Digital Advertising Alliance (EDAA) in the website policies led directly to the EDAA’s opt-out tool. Less common, some websites provided advertising opt-outs implemented by Google or the website itself. Others provided instructions for adjusting cookie or ad related settings in the browser or operating system, such as the “Limit Ad Tracking” setting in iOS. The use of other services like TrustArc (formerly TRUSTe) or Evidon was also relatively rare.

Data deletion controls were provided in privacy policies and account settings. We observed that 111 websites in our sample (74%) provided data deletion mechanisms to their users, which is higher than the 51% in the sample analyzed by GPEN in 2017 [34]. Among websites offering deletion mechanisms, 75 only provided the choices through the privacy policy, three only displayed them in the user account settings, and 33 provided them through multiple locations. However, even when data deletion choices are described in the privacy policy, only 27 policies included a direct link to a data deletion tool or request form. The more common practice was to offer instructions about how to email a data deletion request, as was done in 81 policies.

The GDPR contributed to more deletion controls. In our sample, 37 websites updated their privacy policy around the GDPR effective date. Four websites added their privacy policies post-GDPR. Most of the 37 websites had already included descriptions of privacy choices before the GDPR effective

date, especially for marketing opt-outs (29 out of 37). In our sample, the GDPR had the greatest impact on data deletion controls, with 13 websites adding instructions for deleting account data to their post-GDPR privacy policy. However, such dramatic change was not observed for marketing and targeted advertising opt-outs.

Websites include other data collection controls. Though less common, some websites described additional privacy-related opt-outs in their privacy policy and account settings. Opt-outs for web analytic services (e.g., Google Analytics) were offered by 21% (31) of websites. Interestingly, 17 websites offered opt-outs for the sharing of personal information with third parties. For example, CNN’s privacy policy³ stated that “We may share the Information with unaffiliated Partners and third parties. . .” and provided a link to an opt-out from such sharing. Additionally, nine websites described controls offered by the website, browser, or operating system related to the use of location history or location data.

Only 28 of the 150 websites analyzed (19%) displayed a cookie consent notice on their home page, alerting users that cookies are being used on the website and getting consent to place cookies in the user’s browser. Among them, only five offered a means to opt out or change cookie related settings. However, as these websites were accessed from US IP addresses, we may have observed different practices than those offered to EU-based visitors. Prior work has found a substantial increase in cookie consent notices on European websites post-GDPR [20].

Do Not Track has low adoption. Of the 150 websites analyzed, only eight (5%) specified that they would honor Do Not Track (DNT), a mechanism that allows users to express that they wish not to be tracked by websites, while 48 (32%) explicitly stated that the website will not honor it [31]. Another 91 (61%) did not specify whether or not they would respect the DNT header, which is in violation of the California Online Privacy Protection Act (CalOPPA) [10].

5.3 Descriptions of Choices in Privacy Policies

In addition to analyzing whether privacy choices are present in privacy policies, we analyzed *how* those choices are presented or described. We found a lack of consensus in the wordings used to present privacy choices. Additionally, many websites provided little information regarding what actually happened when a targeted advertising opt-out or data deletion choice was exercised, thus potentially confusing or misleading users.

There is no dominant wording for section headings. Table 3 summarizes common bigrams and trigrams in policy section headings related to privacy choices. Across policies,

³<https://www.cnn.com/privacy>

N-Gram	Email Comm.	Targeted Adv.	Data Deletion
how we use	9	5	2
opt out	13	7	2
person* data	8	1	10
person* inform*	7	2	13
third part*	0	14	2
we collect	15	7	5
we use	11	5	2
your choic*	11	9	10
your inform*	7	3	10
your right*	9	2	20

Table 3: Bigrams and trigrams occurring in at least 5% of privacy policy section headings. Counts are the number of policies (out of 147) in which a n-gram occurred in the headings of sections containing a privacy choice. Some policies described the same privacy choice under multiple headings, or used multiple n-grams in a heading.

similar headings were used to present all three types of privacy choices, e.g., referring to collection and use of personal data or information, or describing a visitor’s rights or choices. In contrast, the bigram “opt out” more commonly referred to choices related to email communications or targeted advertising. Similarly, advertising opt-outs were sometimes presented under sections describing third parties, which is not as applicable to the other two types of privacy choices. However, no single n-gram occurred in more than 20 of the policies we analyzed. This lack of consistency across websites could make locating privacy choices across websites difficult for visitors. Furthermore, some policies included multiple headings related to privacy choices, which could also potentially add significant burden to visitors.

Most marketing opt-outs are first-party. Among the 98 websites that provided at least one marketing communication opt-out in their privacy policy, 80 websites offered opt-outs from the website’s own marketing or promotions. Additionally, 20 policies stated it is possible to opt out of marketing or promotions from third-party companies, and 19 policies specified that visitors could opt out of receiving website announcements and updates. Other less common forms of emails sent by websites that could be opted out from included newsletters, notifications about user activity, and surveys. Some websites offered opt-outs for different types of communications, such as SMS communications (10) and phone calls (8).

Targeted advertising opt-outs are ambiguous. We observed that privacy policies typically did not describe whether visitors were opting out of tracking entirely or just the display of targeted ads. Only 39 of the 80 websites that offered opt-outs for targeted advertising within their privacy policy

made this distinction within the policy text. Among them, 32 websites explicitly stated that the opt-out only applied to the *display* of targeted ads. This lack of distinction could be confusing to visitors who desire to opt-out of *tracking* on the websites for targeted advertising purposes.

The same ambiguity exists with respect to whether an opt-out applies across multiple browsers and devices. Seventy-three websites’ policies did not specify whether the opt-out would be effective across different devices, and 72 did not clarify whether the opt-out applied across all the browsers a visitor uses.

Data deletion mechanisms vary by website. The data deletion mechanisms presented in the privacy policies of 108 websites varied. Visitors had the option to select certain types of information to be removed from their account on 80 websites. Furthermore, 41 websites offered the option to have the account permanently deleted, and 13 allowed visitors to temporarily suspend or deactivate their account.

How soon the data would actually be deleted was often ambiguous. Ninety of 108 websites offering deletion did not describe a time frame in which a user’s account would be permanently deleted and only four policies stated that information related to the account would be deleted “immediately.” Another three claimed the time frame to be 30 days, and two websites said the deletion process could take up to one year.

5.4 Usability of Privacy Choices

Our analysis included how many steps visitors had to take to exercise a privacy choice. We found that email communications opt-outs, on average, required the most effort. We also recorded specific usability issues on 71 websites (30 top, 23 middle, and 18 bottom) that could make privacy choices difficult or impossible to use, such as missing information and broken links.

Privacy choices require several user actions. We counted user actions as the number of clicks, hovers, form fields, radio buttons, or check boxes encountered from a website’s home page up until the point of applying the privacy choice. Table 4 displays summary statistics related to the shortest path available to exercise choices of each type. Opt-outs for email communications and data deletion choices, on average, contained more user actions, particularly check boxes and form elements, compared to opt-outs for targeted advertising. This is likely due to the reliance on the DAA and NAI opt-out tools, which typically required two or three clicks to launch the tool. Data deletion and email communications choices, on the other hand, often required form fields or additional confirmations. At the extreme end, 38 user actions were required to complete the New York Times’ data deletion request form, which included navigating to the privacy policy, following the link to the request form, selecting a request type, selecting up

	Clicks	Boxes	Hovers	Form	Other	Total
Email Comm.	2.90	1.68	0.38	0.33	0.17	5.32
Targeted Adv.	2.80	0.10	0.25	0.00	0.01	3.16
Data Deletion	2.93	1.05	0.23	1.07	0.05	5.32

Table 4: Average number of actions required in the shortest path to exercise privacy choices, counted from the home page up until, but not including, the action recording the choice (i.e., “save/apply” button).

to 22 check boxes corresponding to different New York Times services, filling in eight form fields, selecting four additional confirmation boxes, and completing a reCAPTCHA.⁴

Policies contain missing, misleading, or unhelpful information. Many choice mechanisms were confusing or impossible to use because of statements in the website’s privacy policy. In six instances, text in the policy referred to an opt-out, but that opt-out did not exist or the website did not provide vital information, such as an email address to which visitors can send privacy requests. Six websites included misleading information in the policy text, such as presenting the Google Analytics opt-out browser extension as an opt-out for targeted advertising,⁵ and omitting mentions of targeted advertising in the privacy policy while providing opt-outs elsewhere on the website. Additionally, seven websites mentioned user accounts in the privacy policy but no mechanisms to create a user account were observed on the website. Two of these cases were TrustedReviews and Space.com, whose policies covered multiple domains, including some with user accounts. These issues appeared in fairly equal frequency across top, middle, and bottom websites.

Some websites had broken choice mechanisms and links. We also recorded 15 instances in which provided links to relevant privacy choice information or mechanisms were broken or directed to an inappropriate location, such as the website’s homepage, or the account settings for a parent website. We further observed that four websites offered choice mechanisms that did not appear to properly function. For example, on Rolling Stone’s email preferences page, selections made by visitors seemed to be cleared on every visit. GamePress’s data deletion request form was implemented by Termly and did not seem to refer to GamePress, making it unclear where and how the form would be processed.

Some websites made poor design choices. We noted several website design choices that may impact the usability of

⁴reCAPTCHA: <https://www.google.com/recaptcha/intro/v3.html>

⁵Google merged its advertising and analytics platforms in July 2018, but the Google Analytics opt-out extension only pertains to analytics tracking.

privacy choices. On ten websites, we observed a privacy policy displayed in an unconventional format, such as in a PDF or in a modal pop-up dialogue, instead of a normal HTML page. This may impact how well visitors can search for privacy choices in a policy. Another design choice that impacted searchability was collapsing the policy text under section headings; keyword search is not effective unless all sections are opened. Five policies also had stylistic issues with their policies, such as including opt-out links that were not clickable or advertisements in the middle of the policy. Some websites offered burdensome pages for managing email communication settings, requiring visitors to individually deselect each type of communication sent by the website. Others placed the option for opting out of all communications *after* a long list of different types of content, rather than before it, making it less visible. For example, Amazon offered this option after listing 79 different communications, which rendered it invisible until scrolling much further down the page.

5.4.1 Aids for privacy choice expression

Conversely, a few websites made additional efforts to make their privacy choices more accessible to visitors. Many opt-outs (such as the Google Ad Settings page) went into effect once a visitor expressed a privacy choice, and did not require the additional step of pressing a confirmation (i.e., “save/apply”). Some, like Metacrawler, centralized the privacy choices related to email communications, targeted advertising, and data deletion into a single section of the policy. Others, including Fronter, were diligent about providing links to related privacy information, such as regulation or the privacy policies of third parties used by the website. To further aid visitors, three websites (BBC, Garena, and LDOCE Online) presented important privacy information in a “Frequently Asked Questions” format. Moreover, Google and Booking.com, provided users with a short video introducing their privacy practices.

6 Improving Privacy Choices

Our findings indicate that certain design decisions may make exercising privacy choices difficult or confusing, and potentially render these choices ineffective. We provide several *design* and *policy* recommendations for improving the usability of web privacy choices. Our recommendations not only serve as concrete guidelines for website designers and engineers, but also have the potential to help policy makers understand current opt-out practices, their deficiencies, and areas for improvement. These suggestions could then be integrated into future guidelines, laws, and regulations.

Our discussion is based on the Interaction Cycle, which divides human interaction with systems into four discrete stages [5]. It serves as a framework to highlight the cognitive and physical processes required to use choice mechanisms,

and in turn synthesizes our findings to address specific usability barriers. We mapped the expression of online privacy choices to the Interaction Cycle as: 1) finding, 2) learning, 3) using, and 4) understanding a privacy choice mechanism.

6.1 Finding Privacy Choices

Use standardized terminology in privacy policies. As noted in Section 5.3, no single n-gram was present in an overwhelming majority of privacy policy section headings in which choices were described, and there was much variation in how websites offered privacy choices. For example, data deletion mechanisms were placed under headings like “What do you do if you want to correct or delete your personal information?” in some policies, but under more general headings like “Your Rights” in others. Even more confusing, some policies contained multiple titles similar to both of these.

Inconsistencies across different privacy policies may make finding specific privacy choices difficult. We recommend that future privacy regulations include requirements for standardized privacy policy section headings. Such guidance exists for privacy notices of financial institutions in the United States, as well as data breach notifications to California residents [11, 61]. Our results highlight the most common terms that websites already use in providing privacy choices, which could serve as a foundation for formulating such guidance.

Unify choices in a centralized location. Websites sometimes offer different opt-out choices on different pages of the website for the same opt-out type. This problem is most salient for targeted advertising opt-outs, which could appear either in privacy policies, account settings, or an individual “AdChoices” page linked to from the home page. Furthermore, some privacy policies did not link to the “AdChoices” page or the account settings where the advertising opt-outs were located. Therefore, by looking at just the privacy policy, which may be where many users would expect to find privacy choices, visitors would miss these opt-outs available to them.

One potential solution is having all types of privacy choices in a centralized location. This can be achieved as a dedicated section in the privacy policy, or even as an individual page with a conspicuous link provided on the home page. However, it will likely require regulatory action for many companies to prioritize reorganizing their current opt-outs in this way.

6.2 Learning How To Use Privacy Choices

Simplify or remove decisions from the process. Another practice that adds to the complexity of exercising opt-outs is the presence of links to multiple tools. For instance, more than one third (58) of our analyzed websites provided links to multiple advertising opt-outs. To simplify the privacy choice process, websites should unify multiple choice mechanisms into a single interface, or provide one single mechanism for a

particular type of privacy choice. If not technically feasible, websites should help visitors distinguish the choices offered by each mechanism.

Ensure all choices in the policy are relevant. The use of one policy for a family of websites might be the reason for some of the points of confusion highlighted in Section 5.4. These corporate “umbrella policies” might explain cases where we observed links from the privacy policy directing to unrelated pages on a parent company’s website, or references to account settings even when the website does not offer mechanisms to create user accounts. While maintaining one policy may be easier for parent companies, this places a substantial burden on visitors to identify the practices that apply to a particular website.

To mitigate such issues, companies should carefully check if the information provided in the privacy policy matches the websites’ actual practices. If an umbrella policy is used across multiple websites, practices should be clearly labelled with the websites to which they are applicable. Regulatory authorities should further exert pressure by emphasizing the necessity of having accurate privacy policies and conducting investigations into compliance.

6.3 Using Privacy Choices

Simplify multi-step processes. We noted that privacy choices typically require multiple steps, which may frustrate and confuse users. As described in Section 5.4, our analyzed privacy choices required an average of three to five user actions prior to pressing a button to apply the choice, assuming the visitor knew which pages to navigate to in advance. On the extreme end, completing one deletion request form required 38 user actions, as the interface included several boxes related to different services offered by the website. Though this type of interface allows users to have greater control, websites should also have a prominent “one-click” opt-out box available to visitors.

It is also conceivable that many companies may deliberately make using privacy choices difficult for their visitors. In this case, it is up to regulators to combat such “dark patterns.” [2, 54] Though it may be unrealistic to set a threshold for the maximum number of user actions required to exercise a privacy choice, regulators should identify websites where these processes are clearly purposefully burdensome and take action against these companies. This would both serve as a deterrent to other companies and provide negative examples. Precedents of such regulatory action have emerged, such as a ruling by the French Data Protection Authority (the “CNIL”) which found that Google fails to comply with the GDPR’s transparency requirement as its mobile phone users need “up to five or six actions to obtain the relevant information about the data processing” when creating a Google account [37].

Some of our analyzed websites have already provided exemplary practices to simplify privacy choices, e.g., automatically applying privacy choices once the user selects or deselects an option, rather than requiring the user to click an additional “save” or “apply” button. Clicking an additional button may not be intuitive to users, especially if it is not visible without scrolling down the page. Removing this extra step would avoid post-completion errors, in which a user thinks they have completed privacy choice, but their choice is not registered by the website. A requirement that all changes in privacy settings must be automatically saved could be integrated into regulations and related guidelines. However, any changes should be made clear to the user to avoid accidental changes.

Provide actionable links. Our findings show that the use of links pointing to privacy choices was not ubiquitous, and varied substantially across different types of privacy choices; 93% of websites that offered the choice to opt out of targeted advertising provided at least one link, whereas the percentage for email communication opt-out and data deletion choice was 32% and 24% respectively. Websites that do not provide links usually provide text explanations for the opt-out mechanisms instead. However, visitors may not follow the text instructions if significant effort is required, such as checking promotional emails in their personal inbox for the “unsubscribe” link, or sending an email to request their account to be deleted. We also found that some websites may not provide sufficient guidance to support exercising a privacy choice.

Our findings point to the necessity to enhance the actionability of privacy choices by providing links. However, there should be a careful decision about how many links to include and where to place them. Ideally, only one link for one particular type of opt-out should be provided. When multiple links are presented on the same page, there needs to be sufficient contextual information to help users distinguish these links. Of equal importance is the functionality of provided links. In our analysis, we observed a few instances in which the provided links were broken, directed to an inappropriate location, or had styling that easily blended in with text. These practices reduce the actionability of the corresponding privacy choice and negatively impact the user experience.

6.4 Understanding Privacy Choices

Describe what choices do. We found that privacy policies did not provide many details that informed visitors about what a privacy choice did, particularly in the cases of targeted advertising opt-outs and data deletion choices. Among all websites that provided targeted advertising opt-outs, fewer than 15% distinguished opting out of tracking from opting out of the display of targeted ads, or indicated whether the opt-out was effective on just that device or browser or across all their devices and browsers. Similarly, among all websites

that provided data deletion choices, only 19% stated a time frame for when the account would be permanently deleted.

Future regulations could stipulate aspects that must be specified when certain opt-outs are provided (e.g., the device that the opt-out applies to). This may reduce instances where visitors form expectations that are misaligned with a companies’ actual practices.

7 Conclusion

We conducted an in-depth empirical analysis of data deletion mechanisms and opt-outs for email communications and targeted advertising available to US consumers on 150 websites sampled across three ranges of web traffic. It is encouraging that opt-outs for email communications and targeted advertising were present on the majority of websites that used these practices, and that almost three-quarters of websites offered data deletion mechanisms. However, our analysis revealed that presence of choices is not the same as enabling visitors to execute the choice. Through our holistic content analysis, we identified several issues that may make it difficult for visitors to find or exercise their choices, including broken links and inconsistent placement of choices within policies. Moreover, some policy text describing choices is potentially misleading or likely does not provide visitors with enough information to act. Design decisions may also impact the ability of visitors to find and exercise available opt-outs and deletion mechanisms. We offer several design and policy suggestions that could improve the ability of consumers to use consent and privacy control mechanisms.

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A Websites Analyzed

Top Websites

adobe.com, aliexpress.com, amazon.com, ask.com, bbc.co.uk, bet9ja.com, booking.com, buzzfeed.com, cnn.com, coinmarketcap.com, craigslist.org, dailymail.co.uk, dailymotion.com, diply.com, discordapp.com, dropbox.com, ebay.com, etsy.com, facebook.com, github.com, google.com, indeed.com, mediafire.com, mozilla.org, nih.gov, nytimes.com, paypal.com, pinterest.com, providr.com, quora.com, reddit.com, roblox.com, rumble.com, salesforce.com, scribd.com, slideshare.net, spotify.com, stackexchange.com, stackoverflow.com, thestartmagazine.com, tumblr.com, twitch.tv, twitter.com, w3schools.com, whatsapp.com, wikia.com, wikihow.com, wikipedia.org, wordpress.com, yelp.com

Middle Websites

17track.net, abcnews.go.com, avclub.com, babbel.com, bbb.org, cbc.ca, colorado.edu, desmos.com, file-upload.com, funsafetab.com, furaffinity.net, gamepress.gg, huawei.com, indiewire.com, intel.com, internshala.com, kijiji.ca, ladbible.com, mit.edu, myspace.com, news24.com, openclassrooms.com, opera.com, pathofexile.com, php.net, pixiv.net, poloniex.com, python.org, qwant.com, researchgate.net, rollingstone.com, runescape.com, sfgate.com, signup-genius.com, space.com, speedtest.net, theadvocate.com, trustedreviews.com, tufts.edu, ucl.ac.uk, umd.edu, ups.com, upsc.gov.in, utah.edu, wattpad.com, wikiwand.com, worldbank.org, worldoftanks.com, yifysubtitles.com, zapmeta.ws

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B Website Analysis Template

Step 1: Visit the homepage of the website

1. Please enter the name of the website (use the format "google.com").
2. Did you see a notice for consumers that is an "opt-in" to the website's privacy policy and terms of conditions (including the use of cookies)? [Yes, and it included a way to opt-out or change settings; Yes, but it did not include a way opt-out or change settings; No]
3. Is there an option on the website to create a user account? [Yes, No, Other (please specify)]

Logic: The following two questions are displayed if Q3 = Yes

Step 2: Please create a user account for this site.

4. Do you see the option to opt out of the site's marketing during the account creation process? [Yes, No, Other (please specify)]

5. Does the website have account settings? [Yes, No, Other (please specify)]

Step 3: Look for an "about advertising" or "ad choices" related link on the home page. Click on the "about advertising" or "ad choices" link if it is there.

6. Is there an "about advertising" or "ad choices" related link on the home page? [Yes, and it works; Yes, but it's broken; No]

Logic: The following question is displayed if If Q6 = Yes, and it works or Q6 = Yes, but it's broken

7. What was this link labeled? [Ad Choices, Something else (copy label)]

Logic: The following three questions are displayed if Q6 = Yes, and it works

8. Where does the link direct you to? [Somewhere inside privacy policy, Somewhere inside account settings, An individual web page within the site that introduces OBA opt-outs, DAA's webpage, NAI's webpage, TrustE/TrustArc website, Other group's webpage]

9. By which parties are the advertising opt-outs on this page implemented? Include all entities that are linked to on the page. (select all that apply) [DAA, DAA of Canada (DAAC), European Interactive Digital Advertising Alliance (EDAA), Australian Digital Advertising Alliance (ADAA), NAI, TrustE/TrustArc service, The website, The browser or operating system (e.g., instructions to clear cookies or reset device advertising identifier), Google/DoubleClick, Other groups (please specify), There are no advertising opt-outs on this page]

10. How many user actions (e.g., clicks, form fields, hovers) are in the shortest path to completion out of all the opt-outs provided on this page?

11. What is the default setting for the opt-outs on this page (e.g., types of emails or ads already opted out of)? If none, enter 'NA'.

Step 4: Now please go back to the homepage if you are not already there.

12. Could you find the link to the site's privacy policy, or a page equivalent to a privacy policy? [Yes, and the link works; Yes, but the link is broken; No]

Logic: The following six questions are displayed if Q12 = Yes, and the link works

Step 5: Visit the website’s privacy policy, or the page equivalent to a privacy policy. Some websites may call their privacy policy something else.

13. Please copy and paste the URL for this page. Retrieve this policy through the policy retrieval tool.
14. Please copy and paste the title of the site’s privacy policy.
15. Does the privacy policy (or equivalent page) have a table of contents? [Yes, No, Other (please specify)]

Step 6.1: Next, do a search for “marketing,” “e-mail,” “email,” “mailing,” “subscribe,” “communications,” “preference” or “opt” in the privacy policy to look for marketing opt-outs. Also skim through the policy headings to double check.

16. Does the privacy policy say that the site sends marketing or other types of communications (including email)? [Yes, the site sends communications, No, the site does not send communications, Not specified in the privacy policy, Other (please specify)]
17. Does the privacy policy have text about how to opt out of the site’s marketing? [Yes, No, Not applicable (the site doesn’t send marketing messages), Other (please specify)]

Logic: The following six questions are displayed if Q16 = Yes

18. Please copy and paste the highest level heading in the policy where it describes how to opt out of the site’s marketing.
19. Please copy and paste the paragraph(s) in the policy describing how to opt out of the site’s marketing in the privacy policy.
20. According to the privacy policy, what types of communications can users opt out of receiving? (Make a note in the comment section if the first and third party emails are not clearly distinguished) [Newsletters, First-party marketing/promotional emails, Third-party marketing/promotional emails, User activity updates, Site announcements, Surveys, Mails, Phone calls, Text Messages/SMS, Other (please specify), None of the above]
21. According to the privacy policy, what types of communications users CANNOT opt out of? [Newsletters, First-party marketing/promotional emails, Third-party marketing/promotional emails, User activity updates, Site announcements, Surveys, Mails, Phone calls, Text Messages/SMS, Other (please specify), None of the above]

22. Does the privacy policy specify whether you can opt-out of marketing within the e-mails? [Yes, you can opt-out within the e-mails; Yes, but you can’t opt-out with the e-mails; No, it wasn’t specified]

23. Does the privacy policy include any links to marketing opt-outs? [Yes, there’s one link to a marketing opt-out; Yes, there’re multiple links to a marketing opt-out; No]

Logic: The following four questions are displayed if Q23 = Yes, there’s one link to a marketing opt-out or Q23 = Yes, there’re multiple links to a marketing opt-out

Step 6.2: Next, one by one click the links to the marketing opt-out links.

24. Do any of the links in the privacy policy to the marketing opt-outs work? [Yes, they all work; Some work, but some do not; No, none of the links to the marketing opt-outs work]
25. Please copy and paste the URL(s) of the working links.
26. Please copy and paste the URL(s) of the broken links.
27. How many user actions (e.g., clicks, form fields, hovers) are in the shortest path to completion out of all the marketing opt-outs provided in the privacy policy?

Logic: The following two questions are displayed if Q12 = Yes, and the link works

Step 7.1: Next, do a search for “advertising,” “ads,” in the privacy policy in order to find whether the site has targeted advertising and their related opt-outs. Also skim through the policy headings to double check

28. According to the privacy policy, does the website have targeted advertising? [Yes, the policy states there is targeted advertising; No, the policy states the website does not have targeted advertising; Not specified by the privacy policy]
29. Does the privacy policy page have text about how to opt out of the site’s targeted advertising? [Yes, No, Not applicable (the site doesn’t use OBA), Other (please specify)]

Logic: The following seven questions are displayed if Q28 = Yes

30. Please copy and paste the highest level heading in the policy where it describes how to opt out of OBA.
31. Please copy and paste the paragraph(s) in the policy describing how to opt out of OBA.

32. According to the text of the privacy policy page, what can users opt out from related to OBA/tracking? [OBA only, Tracking, Not specified, Other (please specify)]
33. Does the privacy policy page say whether the OBA opt-outs located in the privacy policy will be effective across different browsers? [Yes, the policy says they will be effective across different browsers; Yes, but the policy says there're for current browser only; Not specified by the privacy policy; Other (please specify)]
34. Does the privacy policy page say whether the OBA opt-outs located in the privacy policy will be effective across different devices? [Yes, the policy says they will be effective across different device; Yes, but the policy says there're for current device only; Not specified by the privacy policy; Other (please specify)]
35. By which parties are the OBA opt-outs mentioned by the privacy policy implemented? Include all entities that are linked to from the privacy policy. [DAA, DAA of Canada (DAAC), European Interactive Digital Advertising Alliance (EDAA), Australian Digital Advertising Alliance (ADAA), NAI, TrustE/TrustArc service, The website, The browser or operating system (e.g., instructions to clear cookies or reset device advertising identifier), Google/DoubleClick, Other groups (please specify)]
36. Does the privacy policy page include any links to an OBA opt-out? [Yes, there is one link to an OBA opt-out; Yes, there're multiple links to different OBA opt-outs; Yes, there're multiple links to same OBA opt-out; No]

Logic: The following four questions are displayed if Q35 = Yes, there is one link to an OBA opt-out or Q35 = Yes, there're multiple links to different OBA opt-out

Step 7.2: Next, one by one click the links to the OBA opt-outs in the privacy policy.

37. Do any of the links in the privacy policy to the OBA opt-outs work? Note: Count links with different text and the same URL as multiple links. Include links from the privacy policy and one layer of linked pages as well. [Yes, they all work; Some work, but some do not; No, none of the OBA opt-out links work]
38. Please copy and paste the URL(s) of the working links. Place each URL on its own line.
39. Please copy and paste the URL(s) of the broken links. Place each URL on its own line.
40. How many user actions (e.g., clicks, form fields, hovers) are in the shortest path to completion out of all the OBA opt-outs provided in the privacy policy?

41. What is the default setting for the OBA opt-outs in the privacy policy (e.g., types of emails or ads already opted out of)? If none, enter 'NA'.

Logic: The following question is displayed if Q12 = Yes, and the link works

Step 8.1: Next, do a search for “delete,” “deletion,” “closing account,” “remove” or similar terms in the privacy policy in order to find data deletion choices. Also skim through the policy headings to double check.

42. Is there any information in the privacy policy that introduces how to delete your account data? [Yes, No, Other (please specify)]
43. Please copy and paste the highest level heading in the policy where it describes how to delete account data.
44. Please copy and paste the paragraph(s) in the policy where it describes how to delete account data.
45. According to the privacy policy, what actions can users perform related to data deletion? [Delete their account permanently, Suspend/deactivate their account (data will not be permanently deleted right away), Choose specific types of data to be deleted from their account, Not specified, Other (please specify)]
46. Please copy and paste the specific types of data indicated in the privacy policy.
47. According to the privacy policy, does the website suspend or deactivate your account before deleting it? [Yes, the policy says your account will be suspended; No, the policy says your account will be deleted after a certain amount of time; Not specified in the policy; Other (please specify)]
48. According to the privacy policy, after how long will the data be permanently deleted? [Not specified, Immediately, One week, 30 days, 60 days, 90 days, 6 months, Other (please specify)]
49. How many user actions (e.g., clicks, form fields, hovers) are in the shortest path to completion out of all the data deletion options?
50. Does the privacy policy include any links to delete your account data? [Yes, there's one link; Yes, there're multiple links; No]

Logic: The following three questions are displayed if Q50 = Yes, there're one link or Q50 = Yes, there're multiple links

Step 8.2: Next, one by one click the links to the data deletion choices.

51. Does the link in the privacy policy to the data deletion choice work? [Yes, they all work; Some work, but some do not; No, they're all broken]
52. Please copy and paste the URL(s) of the working links.
53. Please copy and paste the URL(s) of the broken links.

Logic: The following five questions are displayed if Q11 = Yes, and the link works

Step 9: Next, search for “Do Not Track” or “DNT” in the privacy policy.

54. Will the website honor DNT requests? [Yes, No, Not specified in the privacy policy]

Step 10: Next, skim through the policy for things users can opt-out of. Adjust your previous answers if necessary and complete the following questions.

55. Did you find any other type of opt-outs in the privacy policy? [Yes, No]
56. What other things can users opt out from at this site as described in the privacy policy? [Device info; All first-party cookies; Location history; Profile activities/inferred interests; Sharing with third parties; Google Analytics; Other (please specify); None of the above]
57. When you are skimming through the privacy policy, could you find any other pages that aim to explain the privacy policy or the privacy and data practices of the company in general? [Yes, and the link works; Yes, but the link is broken; No; Other (please specify)]
58. Please copy and paste the URL of the link(s).
59. Did the privacy policy describe the location of a marketing or communications opt out located in the account settings? [Yes, No]

Step 11: Go to this described location in the account settings or look through the main levels of the account settings for marketing, email, or communication choices. Click links which seem to indicate user choice or preferences.

60. Is there any marketing opt-out located in the account settings? [Yes, No, Not applicable (the site doesn't send email/marketing messages), Other (please specify)]

61. How many user actions (e.g., clicks, form fields, hovers) are in the shortest path to completion to this marketing opt-out?

62. What is the default setting for the marketing opt-outs in the account settings (e.g., types of emails or ads already opted out of)? If none, enter 'NA'.

63. Is it the same marketing opt-out page that was presented in the privacy policy? [Yes; No, it's a different marketing opt-out page; There was no marketing opt-out described in the privacy policy; Other (please specify)]

Logic: The following question is displayed if Q63 is not “Yes”

64. What types of communications can users opt out of from in the account settings? [Newsletters, First-party marketing/promotional emails, Third-party marketing/promotional emails, User activity updates, Site announcements, Surveys, Mails, Phone calls, Text Messages/SMS, Other (please specify), None of the above]

65. Did the privacy policy describe the location of an OBA opt-out located in the account settings? [Yes, No]

Step 12: Go to this described location in the account settings or look through the main levels of the account settings for advertising choices. Click links which seem to indicate user choice or preferences.

66. Is there any OBA opt-out located in the account settings? [Yes, No, Not applicable (the site doesn't use OBA), Other (please specify)]

67. How many user actions (e.g., clicks, form fields, hovers) are in the shortest path to completion to this targeted advertising opt-out?

68. Is it the same opt-out page that was presented in the privacy policy? [Yes; No, it's a different OBA opt-out page; There was no OBA opt-out described in the privacy policy; Other (please specify)]

Logic: The following four questions are displayed if Q68 is not "Yes"

69. By which parties is the OBA opt-out in the account settings implemented? Include all entities that are linked to from the account settings. [DAA, DAA of Canada (DAAC), European Interactive Digital Advertising Alliance (EDAA), Australian Digital Advertising Alliance (ADAA), NAI, TrustE/TrustArc service, The website, The browser or operating system (e.g., instructions to clear cookies or reset device advertising identifier), Google/DoubleClick, Other groups (please specify)]

- 70. What can users opt out from related to OBA/tracking from the account settings? [OBA only (users will still be tracked), Tracking, Not specified, Other (please specify)]
- 71. According to the information provided, will the OBA opt-out in the account settings be effective across different browsers? [Yes; No, it's for current browser only; Not specified; Other (please specify)]
- 72. According to the information provided, will the OBA opt-out in the account settings be effective across different devices? [Yes; No, it's for current device only; Not specified; Other (please specify)]
- 73. Did the privacy policy describe the location of a data deletion choice in the account settings? [Yes, No]

Step 13: Go to this described location in the account settings or look through the main levels of the account settings for data deletion choices. Click links which seem to indicate user choice or preferences.

- 74. Is there any data deletion option located in the account settings? [Yes, No, Other (please specify)]
- 75. How many user actions (e.g., clicks, form fields, hovers) are in the shortest path to completion to this data deletion option?
- 76. Is it the same data deletion page that was presented in the privacy policy? [Yes; No, it's a different data deletion page; There was no data deletion choice presented in the privacy policy; Other (please specify)]

Logic: The following four questions are displayed if Q76 is not "Yes"

Step 14: Lastly, look through the main levels of the account settings for other types of user choices. Click links which seem to indicate user choice or preferences.

- 81. Did you find any other opt-outs in the account settings? [Yes, No]
- 77. According to the information provided, what actions can users perform related to data deletion? [Delete their account permanently, Suspend/deactivate their account (data will not be permanently deleted right away), Choose specific types of data to be deleted from their account, Not specified, Other (please specify)]
- 78. Please copy and paste the specific types of data it indicates. Use ";" to separate multiple items.
- 79. According to the information provided, does the website suspend or deactivate your account before deleting it? [Yes, there's information that says your account will be suspended; No, there's information that says your account will be deleted after a certain amount of time; Not specified within the account settings; Other (please specify)]
- 80. According to the privacy policy, after how long will the data be permanently deleted? [Not specified, Immediately, One week, 30 days, 60 days, 90 days, 6 months, Other (please specify)]
- 82. What other things can users opt out from in the account settings? [Device info; All first-party cookies; Location history; Profile activities/inferred interests; Sharing with third parties; Google Analytics; Other (please specify); None of the above]