Improving User Consent Acquisition: A Synthesis of Cookie Popup Design Elements and Proposed Modifications

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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ABSTRACT

Cookies greatly improve the performance and functionality of many web applications, yet are also security risks to users, as they are susceptible to man-in-the-middle attacks and can serve as a medium for spyware. My meta study investigated several published works about cookies, technological design, and autonomy. Based on my research and CS courses at UVA, I determined what design elements best informed users of a website's cookie usage and most efficiently allowed them to select their cookie use preferences. I applied the design elements and strategies I discovered to create a mockup of an ideal cookie popup. Going forward, I am interested in implementing my design mockup to determine if users would restrict cookies more when interacting with my design, compared to current cookie popups.

1. INTRODUCTION

The Covid-19 pandemic certainly catalyzed an increased technologization of the workplace, socialization, and daily tasks. This increased dependency and embeddedness of technology, to avoid illness but keep life as normal as possible, has increased the power technology has over user behavior [1].

Technology users' expectations, limitations, and decisions are heavily influenced by the technology available. With this power to control and influence, technology creators and implementors are responsible for upholding the autonomy of users. Providing those who interact and depend on the internet with the power to control their personal data and make uninhibited decisions about their privacy maintains their trust in web applications and upholds the principles of digital rights and internet freedom.

Cookies are a significant method for data collection over the internet, and data collection allows big corporations to use this data to better serve, target, influence, and control an audience. Users are made aware of cookie usage and asked to consent to this usage predominantly through popups. However, these popups often use deceitful design techniques which threaten a user's ability to choose their preferred level of privacy and security [3]. Furthermore, the application, enforcement, and standardization of ethical UX design practices used for cookie popups allow users to customize their cookie usage more effortlessly and restores the user's ability to make an autonomous choice.

2. LITERATURE REVIEW

Cookies are "a small piece of information sent by a web server to store on a web browser so that it can later be reread from that browser" [5]. It is this process and functionality of cookies that provide websites with a sort of "memory" to store, and later reference, client information such as a user's login data, shopping cart state, or relevant preferences.

The collection of user data from various websites via third party cookies allows data collection companies to create an online activity profile for specific users which are then sold or used for targeted advertising [7].

Popups serve as the main method of user interaction with cookies and often contain dark design elements. According to Frängsmyr [2020]: "Dark Patterns are essential features of interface design crafted to trick users into doing things they might not want to do, but which benefit the business in question". Deceitful design can take many forms, such as pre-checked boxes, misleading language, or confusing interfaces, and can result in users inadvertently providing consent to activities they do not fully understand or agree with. However, to limit the scope of this project I want to focus on the two most frequently occurring elements, obstruction, and interface interference [8]. Obstruction is the utilization of design to make a process more complex or confusing, in an attempt to dissuade an action. With interface interference, elements of a user interface design are presented in a manner that one action will be favored over another [4, 6].

According to Cranor and Habib [2023], a usable consent interface should perform the following: "address user's needs, require minimal user effort, make users aware of what choices exist and where to find them, convey choices and their implication so users understand them easily, satisfy users and engender trust, allow users to change their decision due to error or changing their mind, and avoid nudging users toward less privacy-protective options".

3. MOCKUP DESIGN PROCESS

To convey who the mockup is intended to serve and give context to the improvements it suggests, in the following sections I dive into current examples of deceptive design elements in cookie consent popups and the requirements of users and web applications.

3.1 Review of Design Elements

When looking for elements that serve as interference, there are popups that have the "Accept" or "Accept All" selection button as highlighted or bolded in a different color that draws the attention away from other options such as "Decline All" or "Select Preferences". Sometimes the "Accept" button was the only option that was directly accessible from the initial popup, forcing users to click a link or filter through multiple pages to deselect all the cookies. When seeking out examples of obstruction in cookie consent popups, there are instances of unclear toggle selections of cookie types in addition to confusing naming or description of the types of cookies. Or simply, the exclusion of a privacy policy or description of how the cookies were used by the web application. Additionally, websites will not have a clear way to allow a user to edit their cookie preferences or view the details of cookie usage after selecting a cookie usage option. Large popups can obstruct the screen, while small ones can make it hard to read information. Popups that are difficult to close because of unclear close buttons or specific actions can also be frustrating for users and encourage them to find the quickest method of exiting rather than selecting their genuine preferences.

3.2 Usability Requirements

For an ethical cookie consent form to be utilized and potentially enforced, the technology still must serve the needs of all parties involved. Therefore, it is important to consider the functionalities required by the users and web applications to create a realistic cookie consent form mockup.

3.2.1 User Needs

Users need to be able to understand what they are agreeing to, as many people may not be familiar with the different types of cookies and their functions. Additionally, users should have an equal opportunity to select their preferences and the selection process should be effortless. Finally, users should be able to update their preferences at any time. These requirements provide the user with the freedom to change their mind and the necessary information for them to make an informed decision.

3.2.2 Website Needs and Limitations

It is also important to consider the requirements of the website and the limitations that may exist in creating a user centric cookie consent form. Businesses and organizations want their websites to be easy and enjoyable to interact with, to encourage customers to come back to the site. However, websites may also want to gain profits from selling or allowing access to user data by third parties. By creating a well-designed cookie popup, websites can gain the trust and appreciation of users, which can ultimately encourage and grow their business.

3.3 Methods

To create the mockup, I employed various methods. Initially, I performed a literature review on the existence of deception in cookie popups, and consequences of dark design elements. Additionally, I reviewed current European and American legislation and policy to understand current standards of privacy and cookie consent acquisition and determine what additional enforcement is needed in the US. I explored examples of both bad and good cookie popups in the context of these policies while taking into consideration

the needs of users and websites alike. Ultimately, I collected a set of design elements that I believed would best serve the user and combined these to create an example of an ideal cookie consent popup.

3.3.1 Materials & Knowledge Application

I utilized the design software Figma and viewed YouTube videos and instructions to determine how to create an effective mockup. By applying the knowledge of user and website needs, as well as the review of existing cookie popups, I was able to create a mockup that effectively addresses user privacy and consent.

3.3.2 Solution

The resulting mockup, shown in Figure 1 and Figure 2, is designed to be simple, straightforward, and easy to use. Figure 1 is the initial cookie popup that would be seen by users at the bottom of a web page. Figure 2 is the menu that would be shown after selecting the drop-down arrow next to one of the cookie types in the bottom row of Figure 1. Figure 3 shows an icon that would be displayed in the bottom corner of a web page after a user selects their cookie usage level. If the user hovers over the icon the "Cookie Setting" text appears, and if the user clicks on the icon the cookie consent form in Figure 1 reappears.
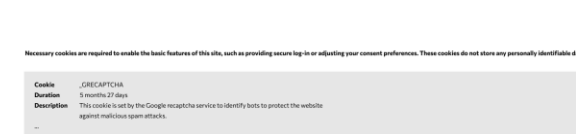

Figure 1: User Centric Cookie Popup Mockup

Figure 2: Necessary Cookie Type Dropdown

Figure 3: Cookie Settings Icon

4. EXPECTED OUTCOMES

Any website could implement this cookie popup design and edit it to properly match their branding. In doing so, websites would provide their users with an effective and transparent method of cookie and privacy selection.

This design includes a simple, easy to understand description of what cookies are and how they are used and explains what it means when you select "Allow All" giving context to the meaning of the other options as well. Additionally, the inclusion of selecting preferences on the initial popup makes it easier and more inclusive for users who have specific cookie preferences. The buttons all have the same coloring and accessibility preventing the user from selecting one over the other. All the while this design remains minimally invasive to the user's view of the website. There are also drop-down buttons that go along with each type of cookie option that would lead to a menu similar to Figure 2 where the type of cookie is explained further and the details about the specific cookies of that type used by the web application would be listed. There is also a link to the privacy policy of the website for users to access for further information.

5. CONCLUSION

While cookies were initially designed to make website usage and product marketing more efficient, they are often exploited to align with business goals. This research is significant, especially for web developers, policy makers and those who are curious about how design affects technology users. By exploring specific modifications that could improve user consent acquisition, cookie popup designers can more efficiently create interfaces that enhance user autonomy and establish trust between users and the internet. Additionally, it can provide concrete design considerations that could be enforced in future consent and cookie policy.

On a positive note, there is already a push within the technology sector to increase inclusivity and ethicality in the design process. There is also a push for the implementation of legislation to protect user data and privacy, which provides hope that internet users who interact with cookies will remain the priority over the benefit of data collectors. Overall, the use of cookies in technology has highlighted the lack of standards and enforcement of data privacy in the US and the need for holding businesses and web applications accountable for ethical design practices.

6. FUTURE WORK

The implications of the use of the mockup developed and discussed in this paper could be verified with the implementation of a prototype. Comparing how users interact with this design versus other popup designs would produce current evidence of how design influences the level of autonomy exercised by the user. Moreover, there is a need for research that examines the potential consequences of sacrificing privacy for technological advancement, such as the impact this sacrifice may have on individual freedoms and civil liberties. It is crucial to continuously have an open dialogue about these topics and concerns to best protect internet users and ensure that privacy and autonomy are prioritized in the digital world.

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