COOKIES: SYNTHESIZING POPUP DESIGN ELEMENTS TO PROPOSE DESIGN MODIFICATIONS THAT IMPROVE USER CONSENT ACQUISITION

ANALYZING DECEPTIVE DESIGN IN COOKIE CONSENT BANNERS THROUGH AN ETHICAL LENS

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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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Introduction

The use of web cookies in the United States has become increasingly common, and along with them a plethora of popups asking website users to consent or deny to the use of cookies. But what are users actually agreeing or disagreeing to? Simply put, 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" (György, 2002, p. 243). 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 overall preferences. However, the use of cookies has evolved beyond just these simplistic and intrinsic functions. The use of third-party cookies, cookies placed by a domain that is different than the website the user is accessing, has given major data brokerages, online advertisers, and tracking applications access to this client information (Cahn et al., 2001). The collection of this data from various websites overtime allows these organizations to create an online activity profile for specific users which are then sold or used for targeted advertising (Shah & Kesan, 2009). However, many users do not realize how their data is being collected, stored, and used. They also do not realize that some cookies easily lack basic security measures such as encryption, or authentication schemes that do not rely on cookie expiration to automatically terminate a login session (LaCroix, 2017; Sit, 2001). This lack of security requirements allows for cookie data to be easily intercepted over network traffic by an "eavesdropper [who] can steal and reuse a cookie, impersonating a user indefinitely" (Sit, 2001, p. 120). Overall, cookies have both significant privacy and security implications, which users are not fully aware. It is this lack of awareness that puts into question the effectiveness of acquiring user consent to the use of cookies. If users do not know what cookies are being used, how they are

being used, and the implications of their use, how can users make an informed decision? Additionally, if a popup does not provide an effortless and efficient way for users to deny the use of these cookies, or explain how users can remove or add cookies later, is this not taking away a user's autonomy? The deceptive design of cookie notice makes one wonder if there is a better way acquire a user's consent to the use of this technology. Therefore, I aim to explore the array of design strategies developers use for cookie popups while focusing primarily on 2 deceitful design patterns: "Obstruction" and "Interface Interference" (Maier and Haar, 2020, p. 178). After performing this literary review, I aim to create a mockup of a cookie popup that promotes the collection of informed, voluntary consent of users to the use of cookies. Furthermore, I will analyze cookie pop up design through the lens of 3 ethical frameworks: utilitarianism, the rights approach, and the virtue approach. This analysis will address the ethicality of deceptive design use in cookie popups to acquire consent, in addition to evaluate the significance of ethical technological design.

Cookies: Synthesizing Popup Design Elements to Propose Design Modifications That Improve User Consent Acquisition

Generally, 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. In the technical sense, cookies are small text files that are sent to a web server and contain key/value pairs of data that describe the current state of a web session. (Cahn et al., 2016; Sit, 2001) For example, these key/value pairs could include: "Name=Value; Host=example.com; Path=/account; Expires=Tue, 1 Dec 2018 10:12:05 UTC; Secure;" (Cahn et al. 2016, p.).

Users are made aware of cookie usage and asked to consent to this usage predominantly through popups. However, these notices often use deceitful design techniques which threaten a user's ability to choose their preferred level of privacy and security. Generally, "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" (Frängsmyr, 2020, p. 3). The five major types of dark design patterns include "Nagging", "Obstruction", "Sneaking", "Interface Interference", and "Forced Action" (Maier and Harr, 2020; Gray et al., 2018). In my technical I want to focus on obstruction and interface interference. These two are the most frequently used deceptive design patterns for cookie notices (Soe et al., 2020). Obstruction is the utilization of design in order to make a process more complex or confusing, in an attempt to dissuade an action which includes instances of being unable to make an informed decision because it is difficult or impossible to compare options, of being easily able to get into a particular situation but very difficult to get out of it. Interface interference is when elements of a user interface design are presented in a manner that one action will be favored over another (Maier and Harr, 2020; Gray et al., 2018). Furthermore, "Informed consent and decisional capacity make sure that the patient/user's autonomy is maintained even in the presence of disruptive or distorting factors." (Burton et al., 2019, p. 16) which can very much be hindered if the information is not displayed in an effective, efficient, and viewable way, as would be the likely case with obstruction and or interface interference.

If instead, privacy policies were not documents that would take individuals 30 workdays to read, and users were presented an accessible, clear, and concise description of a website's use of cookies, then they could make an informed decision about cookie usage (TEDx Talks, 2020). The application, enforcement, and standardization of ethical UX design practices used for cookie

notice allow users to customize cookie usage more effortlessly and restores the user's ability to make an autonomous choice. Considering the long process of creating and passing legislation and regulation, starting first with engineers and designer to encourage ethical design techniques could more quickly and effectively prevent cookie popups from threatening user technological consent, privacy, and security without user's knowledge.

Analyzing Deceptive Design in Cookie Consent Banners Through an Ethical Lens

While there is a distinct separation between the law and ethics, there are many rules and regulations that society and more specifically the workplace and engineers put into place to encourage good practices. Ethical guidelines, from simply being honest and accurate to maintaining respectable interactions between employees, are in place to help define right from wrong. However, there seems to be a history within engineering where ethics do not extend to the products being designed and implemented. For instance, in Winner's "Do Artifacts Have Politics", he talks of Robert Moses' overpasses in Long Island, New York that were "built to specifications that would discourage the presence of buses" and were "deliberately designed to achieve a particular social effect" of preventing poorer people from entering Long Island (1980, p. 123). Clearly, proper ethics were either not included in the design process or not enforced. This perpetuated discriminatory and racist beliefs, which certainly did not uphold a utilitarian approach of creating the most good for the most amount of people. Having seen this trend with other instances of technology such as AI facial recognition, and the misuse of cyber security tools by professionals, I hope to analyze the ethics integrated into the design of consent banners pertaining to cookies.

Generally, there are 3 broad categories of ethics: consequentialist, non-consequentialist, and agent centered (Bonde & Firenze, 2013). In order to evaluate the ethical consequences, intentions of cookies popup designers, and the overall ethicality of the implementation of the cookie consent banners, I want to explore a framework from each of these major categories. The utilitarian approach is more concerned with the amount of good and harm produced because of an action or decision (Schinzinger & Martin, 2000). Through this lens, when a user consents to the use of cookies, who is benefited and who is harmed, and to what extent. However, I find it important to not just look at the monetary or physical consequences of cookie popup design but at the effects on human autonomy and power dynamics. This analysis also bleeds into the rights approach in ethics. According to this framework, "respect for human rights are obligatory, regardless of whether they always maximize good" (Schinzinger & Martin, 2000, p. 43). Additionally, in coupling with the rights approach the duty approach is the idea that "if you have a right to not be deceived, then I have a duty not to deceive you" (Schinzinger & Martin, 2000, p. 45). Not only is good and ethical design important for users, but it is also the responsibility of the designer. The virtue approach addresses an ethical issue from the idea that "virtues are attitudes... that enable us to be and to act in ways that develop our highest potential" (Velasquez et al., 2015) and therefore a virtuous person is an ethical one. This framework is useful in prompting ideas of how a particular situation or design could be different and improved. And bring into light the importance of enforcing and maintaining ethical codes in engineering. Value Sensitive Design, as explained by Anders Albrechtslund, suggests the possibility of a design approach to technology that incorporates human values and this ethical framework (Albrechtslund, 2007; Friedman et al., 2001).

While theory is a fantastic way of understanding what can be considered right from wrong, often ethics is not so cut and dry in its practical application. Deborah Johnson, in her article "Engineering Ethics: Contemporary and Enduring Debates", mentions Caroline Whitbeck and her perspective of viewing practical ethical decision-making in the same context of a design problem. Not all groups of engineers, given the same specifications, will not create the same product, but that does not make any of them wrong (Johnson, 2020). Therefore, it is important when determining design ethicality to consider real world elements like the necessary prioritization of specifications in the design process. Perhaps it is valuable to not just look at the designers and the requirements they are given to determine ethicality but also contextualize engineers within the firms and environments which they are performing (Shah & Kesan, 2009). Ultimately, engineers have the potential of wide social influence and must be held to an ethical standard, otherwise there may be many consequences that lead to a perpetuated loss of humanity amongst designers and the interacting users of technology.

Research Question and Methods

Given the lack of regulation of cookies and the acquisition of consent to cookie use in the US, I want to understand: Are the design elements and patterns used by developers to create cookie popups considered ethical under utilitarianism, the rights approach, and the virtue approach to ethics? To answer this question, I will perform a literary analysis on cookies, design, and autonomy to determine what factors contribute to influencing human behavior in relation to consent and instant gratification marketing. Additionally, I hope to explore how these factors may be incorporated in design, and what actors are at play that may be motivated to influence users to interact with cookies in a certain way and why. To maintain a reasonable scope on this research, I

aim to keep my technical references current, published within the last 5 years, and focus my analysis on the specific design strategies of obstruction and interface interference. After completing more technical research, I will create a mockup of a cookie consent banner using Figma, avoiding the elements I discovered to be harmful and implementing alternatives.

Additionally, this research will be looked at through a sociotechnical lens, specifically the utilitarian, rights, and virtue ethical frameworks. This ethical analysis will be performed by reading journals and articles by ethical theorists, coupled with research that conveys the application of ethics to other areas of technology. In order to conclude if a cookie popup design is ethical, I will use Sheila Bonde and Paul Firenze suggested methods of applying ethical frameworks to decision making by recognizing the ethical issue, considering the parties involved, gathering all of the relevant information, and formatting actions and considering alternatives (Bonde & Firenze, 2013). I expect this research to bring to light the need for change in the way software engineers generally design consent notices, and the need for ethical consideration in the design process to maintain humanity and goodness in technology.

Conclusion

Cookies, while they offer users a more elegant interaction with a website, have the potential to threaten a user's data privacy and security. However, most users are not fully aware of these implications, for their only interaction with cookies is when a website asks them to agree to their use by clicking yes or no. Often when they click no it leads them down a rabbit hole of questions or links or selections, which results in users giving up their privacy and security simply for ease and efficiency. The design of cookie popups is one opportunity to maintain the value of consent and autonomy within our technological society. The objective of my technical project is to create

a template for an ideal cookie pop-up that improves user consent acquisition. I hope to synthesize a variety of popup design elements and determine how they contribute to the manipulation of user interactions or encourage awareness and ethical consent acquisition. Furthermore, I aim to explore the utilitarian, rights, and virtue ethical approaches to evaluate the ethicality of the design elements of current cookie notices and determine how software developers can better implement ethics in their design choices.

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Appendix

CS 4991 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.