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Beyond the Banner:

Understanding the Impact of Cookie Consent Interfaces on User Data Privacy Choices

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ABSTRACT (MAX. 200 WORDS):
Data protection regulations mandating explicit user consent for personal data collection have spurred the development of cookie consent interfaces. This study explores the factors influencing user experience with these interfaces and their impact on data privacy choices. Through qualitative analysis of semi-structured interviews with university students, several key factors emerged that shape users' interactions and decisions. The findings reveal that interface design significantly affects user understanding and decision-making. Clear language, readable formatting and accessible options empower users, while dark patterns can nudge them towards less privacy-protective choices. User characteristics, such as privacy attitudes and emotional states as well as contextual factors such as time pressure also shape interactions. Based on these insights, guidelines are proposed for designing user-centric cookie consent interfaces that prioritise clarity, control and transparency. Recommendations include using plain language, presenting options clearly, avoiding nudging, enhancing visibility, addressing privacy literacy and maintaining consistency. The study highlights the critical role of cookie consent interface design in fostering informed user decisions and trust in an increasingly complex digital landscape. By adopting user-centric principles, cookie consent interfaces can effectively support users' data privacy rights.

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1 Introduction

This chapter will provide an overview of the study's context, outline the research problem, explain the study's objectives and define the research question. Furthermore, the scope and limitations of the study will be discussed here.

1.1 Background

Since the 1980s, information systems (IS) scholars have extensively studied the various aspects of information privacy, which has been categorically defined as the ability of the individual to personally control information about one's self (Smith et al., 1996; Popovič et al., 2017). With the proliferation of the Internet and the integration of online technologies into every aspect of daily life, concerns about information privacy in the digital domains among the general public have only grown, as shown by a global survey by (Centre for International Governance Innovation & Ipsos, 2019), in which 78% of respondents expressed concern about their online privacy. With the rise of smartphones, social media, e-commerce and other information and communication technologies (ICT), vast troves of personal data are now generated through our digital activities (Heng Xu & Dinev, 2022).

One of the main methods websites use to collect user data is through cookies. Cookies are small data packets stored on web browsers that hold user information like authentication details and shopping cart contents (Kristol, 2001). While initially used to facilitate stateful browsing, cookies have become a common method for user tracking across websites, often by third-party domains, for purposes like advertising and analytics (Sanchez-Rola et al., 2019). This ubiquitous data collection has raised critical questions about user privacy and the need for informed consent (Sanchez-Rola et al., 2019).

In response to growing public concerns about online privacy, many countries have enacted data protection legislation (Hoofnagle et al., 2019). The European Union's General Data Protection Regulation (GDPR) is a landmark development in this context, establishing a comprehensive and robust regulatory regime for personal data protection (European Commission, 2023; Hoofnagle et al., 2019). It mandated that websites acquire affirmative consent from users before collecting their data through mechanisms like cookie consent interfaces (European Commission, 2023). These interfaces, often presented as pop-up notices or banners, aim to provide transparency about a website's data practices and give users control over what data they share (Nouwens et al., 2020; Sanchez-Rola et al., 2019).

However, the proliferation of consent interfaces following GDPR has led to frustration among many users. Complex interaction flows, unclear information and manipulative design patterns (often called "dark patterns") can undermine the very control and transparency these interfaces are meant to provide (Gray et al., 2021; Nouwens et al., 2020). Events like the Facebook-Cambridge Analytica scandal, where 87 million Facebook users in the US had their private data collected and shared without consent (Confessore, 2018), exposed how little control consumers have over their data, eroding public trust in how corporations handle personal information. This has called for strengthened legal rights and protections around online information privacy (Isaak & Hanna, 2018).

The GDPR represents a significant attempt to strengthen user privacy rights through enforceable means (EUR-Lex, 2016). It provides user rights like accessing and deleting personal information while mandating that organisations acquire affirmative consent before data collection. However, the effectiveness of these measures in empowering users to control their data privacy through mechanisms like cookie consent interfaces remains an important area of investigation (Habib et al., 2022).

1.2 Research Problem

Cookie consent interfaces, which have become prevalent on websites following the introduction of GDPR, aim to help users manage their digital privacy. Yet, questions have been raised regarding the effectiveness of these interfaces in facilitating informed decisions by users regarding their data privacy (Habib et al., 2022). Additionally, the study by Sørum and Presthus (2021) has shown that many users lack awareness or understanding of the implications of their choices on cookie consent interfaces. This lack of awareness and ability to comprehend the consequences, which stems from limited technological literacy (Hirschprung & Reznik, 2022), can lead to the abuse of data privacy and create an imbalance between service providers and users, limiting their right to privacy.

Furthermore, prior research has highlighted the presence of dark patterns in cookie consent interfaces, which can lead users to choose less privacy-protective options (Habib et al., 2022; Gray et al., 2021; Nouwens et al., 2020). These dark patterns, such as the use of confusing language, hidden options or manipulative design, can result in users unknowingly consenting to data collection and prevent them from making their preferred choice. The lack of understanding of available choices and poor usability of privacy control interfaces can lead to "privacy fatigue" in users, forcing them to reveal more information over time (Habib et al., 2022).

These issues underscore the need for consent management interfaces to not only satisfy regulatory requirements but also meet the expectations of user experience, such as findability, usefulness, understandability and usability (Habib et al., 2022). While prior research has explored the existence of dark patterns in consent management interfaces, there is a lack of comprehensive empirical research evaluating the user experience aspects of cookie preference interfaces. Therefore, this study aims to address this gap by evaluating existing interfaces in terms of findability, usefulness, understandability and usability. By doing so, it seeks to contribute to the body of knowledge on designing intuitive interfaces that enhance user experience and support users in making informed choices about their data privacy.

1.3 Research Aim

The aim of this thesis is to explore the factors that affect the user experience with cookie consent interfaces and how websites and applications can improve user experience of preference setting to enable users to understand their rights and make the correct decision. This led us to our research question:

How do cookie consent interfaces, implemented to comply with privacy regulations, influence users' understanding and decision-making regarding their data privacy?

1.4 Research Motivation

The motivation for this study is to contribute to the understanding and improvement of user experiences with cookie consent interfaces. By comprehensively evaluating the user experience aspects of these interfaces, this research aims to move beyond the focus on manipulative tactics explored by Habib et al. (2022), Mathur et al. (2021), Utz et al. (2019) etc. and highlight design options that enhance the user experience. This study will examine multiple user experience dimensions holistically, testing real users across various design parameters. By doing so, it seeks to identify which parameters, combinations and values effectively enhance the user experience. The findings of this research can inform the development of practical design guidelines tailored to improve user experience, benefiting regulators, industry professionals and design practitioners.

Moreover, the insights gained from this study can shape future regulations of consent interfaces by highlighting effective design patterns and choices that prioritise user understanding and control. By promoting user-centric design, this research aims to contribute to the creation of consent interfaces that support and empower users in managing their data privacy, rather than overwhelming or manipulating them. Ultimately, by enhancing the user experience of cookie consent interfaces, this study seeks to increase the adoption of privacy tools. Interfaces that are intuitive, transparent and user-friendly can encourage more meaningful engagement with data privacy controls, enabling users to make informed choices that align with their preferences.

In summary, this research is motivated by the need to understand and improve user experiences with cookie consent interfaces. By providing insights into effective design options, informing future regulations and promoting the adoption of user-centric privacy tools, this study aims to contribute to the empowerment of users in managing their data privacy in the digital age.

1.5 Delimitation

This study focused on a specific target group: individuals actively enrolled as university students from similar educational, demographic and cultural backgrounds. While this homogeneity among the respondents allowed for a more controlled examination of user experiences within this particular context, it also limits the generalizability of the findings to a broader population. Future research could benefit from including a more diverse sample in terms of age, technical literacy and cultural background, which would add further value and enhance the transferability of the results. Employing a larger sample size could yield more generalizable findings and facilitate a more nuanced understanding of the interplay between user characteristics and design elements.

Additionally, the scope of this study was limited to the user's perspective and did not delve into the implications for businesses and websites implementing cookie consent interfaces.

Further research could investigate the challenges and considerations that organisations face when designing and deploying these interfaces, as well as the potential impact on their data collection practices and business models.

Despite its limitations, this study provides valuable insights into user experiences with cookie consent interfaces within the specific context of university students from similar backgrounds. By focusing on this target group, the research offers a detailed understanding of how these interfaces are perceived and navigated by a relatively homogeneous demographic. The findings and design recommendations generated from this study can serve as a foundation for future research and inform the development of more user-centric consent interfaces, while also highlighting the need for further investigation into the experiences of diverse user populations.

2 Literature Review

To establish a strong foundation for this thesis, a thorough examination of scholarly literature relevant to the research topic is essential. This literature review aims to achieve a deep understanding of the subject by exploring various theoretical concepts that offer valuable insights. Furthermore, it delves into the conceptual underpinnings that guided the research itself. The following chapter will present prior research on related areas, including data privacy, user experience as well as data collection mechanisms and consent, alongside relevant frameworks that inform this study.

2.1 Data Privacy

There is no single, universally accepted definition of data privacy. While some, like Clarke (1999), view it as a moral or legal right, others, such as Bélanger et al. (2002) emphasize the individual's ability to control their own information. Popovič et al., (2017) define information privacy concerns the desire of individuals to exert control over or at least influence, the data that pertains to them. Regardless of the specific definition, the multifaceted nature of privacy issues is undeniable. The rise of information technology has brought data privacy to the forefront, highlighting its potential risks (Bharti & Aryal, 2023) and prompting Information Systems (IS) researchers to explore the issue.

Skinner et al. (2006) identify data privacy as a subclass of the broader concept of privacy. They suggest that most interpretations of privacy center on a human right, albeit with contextual variations. Clarke (1999) further refines this concept by identifying four distinct dimensions: privacy of the person, personal behavior privacy, personal communication privacy and personal data privacy. In the digital age, due to communication being digitized and stored the boundaries between personal communication privacy and data privacy have blurred out. This is particularly true since technology is a key driver of both the concerns and potential solutions related to data privacy (Bharti & Aryal, 2023; Malhotra et al., 2004). Advancements in information and communication technologies allow for the collection, aggregation and analysis of data at an unprecedented speed and scale (Malhotra et al., 2004). Moreover, this data collection can even occur without individuals' knowledge (Bélanger & Crossler, 2011), this necessitates robust data protection regulations to safeguard individual privacy rights (Strycharz et al., 2020).

2.1.1 Data Protection Regulations

Data protection regulation encompasses laws and rules that govern the collection, processing and safeguarding of personal data to uphold individuals' privacy rights and ensure responsible data handling practices by organizations (Hoofnagle et al., 2019). The advancements in digital technologies have transformed personal data collection, storage and dissemination, resulting in a vast increase in information that is being gathered about individuals (Bharti & Aryal, 2023; Long & Quek, 2002).

Concurrently, the globalization of trade and finance has blurred geographical boundaries, making it increasingly challenging for governments to monitor and regulate the activities of

multinational corporations that transfer data across national jurisdictions (Long & Quek, 2002). These developments fueled public concerns regarding the potential for privacy erosion. In response to this growing anxiety, numerous countries around the world began enacting data protection legislation (Long & Quek, 2002; Hui et al., 2007; Straub & Collins, 1990). Germany pioneered these efforts with the first data protection law implemented in the state of Hesse in 1970. This initial legislation was followed by similar measures in Sweden (1973), the United States (1974) and France (1978) (Long & Quek, 2002).

The national legislative trend was further strengthened by the emergence of crucial international organizations (Long & Quek, 2002). The Council of Europe (COE) spearheaded the development of the Convention for the Protection of Individuals concerning the Automatic Processing of Personal Data (Long & Quek, 2002). The international guidelines defined by such organizations have exerted a profound influence on the enactment of data protection laws globally (Long & Quek, 2002).

However, the European Union's GDPR stands out as a landmark development in information policy. The GDPR establishes a comprehensive and robust regulatory regime for personal data protection (Hoofnagle et al., 2019). Similarities, albeit in less stringent forms, can be found in existing U.S. privacy laws. Furthermore, the GDPR implements established constitutional commitments that hold a central place in the outset of the European Union as a political entity navigating the challenges of the information age (Bharti & Aryal, 2023; Hoofnagle et al., 2019). The implementation of data protection regulations, emphasizing user control over personal information, has spurred the development of cookie consent interfaces on websites (Hirschprung & Reznik, 2022), which will be explained in section 2.2.2.

2.1.2 Privacy Literacy

With the rise of online platforms, users now face a complex balancing act of deciding what to keep private and what to share publicly (Bartsch & Dienlin, 2016). This challenge has spurred the need for a new kind of literacy – online privacy literacy (Bartsch & Dienlin, 2016). Just as personal privacy is essential offline for our sense of autonomy and secure communication, online privacy is crucial for fostering authenticity in the virtual world (Bartsch & Dienlin, 2016).

Prince et al. (2023) define privacy literacy as the knowledge and skills individuals possess regarding their online privacy. It encompasses two key areas – declarative and procedural. Declarative privacy knowledge refers to understanding how websites and service providers handle personal data (Prince et al., 2023; Bartsch & Dienlin, 2016). This encompasses understanding data collection practices, data protection mechanisms and the legal frameworks that regulate online data collection (Prince et al., 2023; Bartsch & Dienlin, 2016). Procedural privacy knowledge on the other hand refers to the actions users take to protect their privacy online (Prince et al., 2023; Bartsch & Dienlin, 2016). This includes using privacy settings, avoiding suspicious websites and employing other strategies to mitigate their concerns about how their personal information flows online (Prince et al., 2023; Bartsch & Dienlin, 2016). By developing both declarative and procedural privacy knowledge, individuals can navigate the online environment effectively and make informed decisions about their online behaviour (Hirschprung & Reznik, 2022). This empowers users to protect themselves from potential privacy violations and maintain control over their personal information.

Privacy concern represents another critical aspect that shares a strong connection with privacy literacy. Online privacy concerns revolve around several key issues such as unauthorized access to personal information through hacking or breaches, unconsented monitoring of online activities via cookies and other tools and the potential for data breaches and the subsequent misuse of sensitive information (Harborth & Pape, 2020; Prince et al., 2023). These anxieties significantly influence users' willingness to share personal data online as they see a lack of control over its collection and usage (Burkhardt et al., 2023). The prevalence of privacy-intrusive practices like data trafficking and detailed online profiling further highlights the significant threats to user privacy and the limitations of current legal frameworks in addressing these ethical complexities (Ebert et al., 2021; Prince et al., 2023).

Furthermore, Habib et al. (2022) discuss the correlation between intricate privacy controls (explained in Section 2.3.1) and user behavior and concerns terming it as "privacy fatigue" which leads to unintended data disclosure. This phenomenon can be understood through the lens of "privacy cynicism," a core component of privacy fatigue, defined by Van Ooijen et al. (2024). Privacy cynicism reflects feelings of frustration, hopelessness and disillusionment with data privacy practices (Van Ooijen et al., 2024). Van Ooijen et al.'s (2024) research suggests that privacy fatigue weakens the relationship between privacy concerns and actual privacy-protective behavior. In other words, even if users are concerned about privacy, high levels of fatigue can lead them to disclose information unintentionally. Clear language, streamlined interfaces and well-designed visual cues empower users to make informed choices about their data (Habib et al., 2022). In essence, privacy literacy and user-centric design (explained in Section 2.3) plays a crucial role in promoting informed consent and mitigating the negative effects of privacy fatigue on user behavior.

Privacy literacy plays a crucial role in enabling internet users to effectively assess the potential risks associated with disclosing and sharing personal information online (Choi, 2023). Individuals with a higher degree of privacy literacy tend to exhibit a heightened awareness of data collection practices and potential misuse, which can lead to lower privacy concerns (Choi, 2023). This is because they possess the ability to adopt self-protective strategies and actions through procedural knowledge (Prince et al., 2023). In the context of data privacy and cookie consent, online privacy literacy becomes even more critical. Understanding cookie consent mechanisms and the implications of various options empowers users to make informed decisions about their data and who can access it (Strycharz et al., 2021).

2.1.2 Privacy Paradox

Studies consistently reveal a high level of privacy concern among internet users (Kokolakis, 2017; Rychwalska, 2022; Smith et al., 2011; Young & Quan-Haase, 2013). However, this concern appears to contradict actual user behavior, as individuals often readily share personal information online, sometimes for minimal perceived benefits (Rychwalska, 2022). This inconsistency between stated privacy concerns and actions is referred to as the "privacy paradox" (Kokolakis, 2017; Smith et al., 2011; Young & Quan-Haase, 2013). There are several explanations for this apparent disconnect.

One explanation lies in the concept of privacy calculus. Users weigh the perceived benefits of data sharing, such as convenience and discounts, against the potential risks like identity theft and security breaches (Gerber et al., 2018; Kehr et al., 2015; Jozani et al., 2020). Even when

the perceived benefits outweigh the risks, privacy concerns may still persist (Gerber et al., 2018; Kehr et al. 2015; Jozani et al, 2020).

Furthermore, bounded rationality and decision biases can lead to suboptimal choices. Limited cognitive resources and inherent biases can hinder users' ability to process information fully (Gerber et al., 2018; Shikta et al., 2021). This may result from underestimating risks or overestimating benefits associated with data sharing (Gerber et al., 2018; Shikta et al., 2021).

Several other factors contribute to the privacy paradox. Limited exposure to the negative consequences of data sharing might weaken the association between privacy concerns and actual behavior (Gerber et al., 2018; Kokolaki, 2017). Additionally, some users may lack the technical knowledge to implement privacy-protective measures (Barth et al., 2019; Gerber et al., 2018; Sørum & Presthus, 2021). Social influence also plays a role. Data-sharing decisions can be heavily influenced by social norms and peer pressure (Gerber et al., 2018; Mendel & Toch, 2017). Individuals within a social circle may feel compelled to share information, even if it conflicts with their expressed privacy concerns (Gerber et al., 2018; Mendel & Toch, 2017).

Additionally, the perceived trustworthiness (Gerber et al., 2018) and familiarity (De Boer et al., 2021) of the data recipient and the level of perceived risk (also known as Risk and Trust Model) associated with data disclosure can have a complex influence on both behavior and attitudes. Perceived risk might be stronger when expressing hypothetical attitudes, while trust has a stronger effect on actual behavior (Gerber et al., 2018; Kokolakis, 2017).

Users might be given a sense of control over their data, even if they only control the initial publication but not subsequent uses by third parties (De Boer et al., 2021; Gerber et al., 2018). This illusion of control can lead to more data sharing than intended (De Boer et al., 2021; Gerber et al., 2018; Rychwalska, 2022). Finally, the way privacy attitudes and behavior are measured can impact the results. Dichotomous data might not accurately capture the nuances of user behavior, potentially masking a stronger underlying relationship between attitudes and actions (Gerber et al., 2018).

The concept of the privacy paradox presents a significant challenge in the terms of user experience of cookie consent interfaces. Users may express a desire for privacy, yet they may also prioritize convenience or overlook privacy concerns when faced with lengthy or complex cookie consent notices. This can lead to users simply selecting an option without fully understanding the data collection practices being consented to. To address this challenge, cookie consent interfaces should be both transparent and user-friendly. Clear and concise language should be used to explain data collection practices. Additionally, the interface should be designed to encourage informed decision-making, allowing users to easily understand and customize their consent preferences.

2.2 Data Collection Mechanisms and Consent

The advancement of digital technologies has enabled the collection of user data at volumes that were previously unimaginable. Websites and online platforms leverage a variety of methods, including cookies, to gather information about user behavior and preferences (Heng Xu & Dinev, 2022). This ubiquitous data collection raises critical questions concerning user privacy and the need for informed consent.

2.2.1 Cookies

Cookies were introduced by Lou Montulli in 1994 in the Netscape browser to address the challenge of maintaining state or context within the stateless browsing session (Kristol, 2001). Cookies are basically small data packets stored on web browsers by web applications to hold user data such as authentication details and shopping cart information (Kristol, 2001). While initially facilitating stateful browsing, cookies have become a common method for user tracking across websites, often by third-party domains, for purposes like advertising and analytics (Sanchez-Rola et al., 2019). Using cookies, websites can remember user login credentials for personalized access, eliminating the need for repetitive password entries (Kristol, 2001). Additionally, cookies enable website administrators to track user navigation patterns, informing website organization to optimize information accessibility based on user behavior (Kristol, 2001).

In the context of privacy cookies can be classified as: first-party cookies and third-party cookies. First-party cookies are often seen as essential for the proper functioning of websites and are more widely accepted by users (El Hana et al., 2023; Kristol, 2001). These cookies are set by the website being accessed by the user, serving mainly to enhance user experience through retention of data such as login credentials, preferences or items in a shopping cart (Kristol, 2001). On the other hand, third-party cookies are set by companies other than the one the user is directly interacting with, often for advertising and tracking purposes (El Hana et al., 2023; Kristol, 2001). These cookies can track users across different websites to create a profile of their browsing habits and interests (Tappenden & Miller, 2009; Kristol, 2001). This profiling allows advertisers to serve targeted ads to users, potentially sharing or selling these profiles to other companies. This raises serious privacy concerns as advertisers can track users across multiple websites, accumulating information about their browsing habits without their explicit consent (Kristol, 2001). Users have limited control over the use of third-party cookies. Unlike first-party cookies, users may not be aware of which third-party sites are tracking their online activities, leading to concerns about data privacy and security (Kristol, 2001).

2.2.2 Cookie Consent Interfaces

Data protection regulations requiring explicit user consent for personal data collection have led to the development of cookie consent interfaces, which inform users about website cookies and obtain their consent for data collection (Nouwens et al., 2020; Sanchez-Rola et al., 2019). This dominant approach relies on presenting users with an informational statement, commonly known as a "cookie banner," which details the website's data collection practices (Nouwens et al., 2020). User interaction with this banner, either explicit consent or inaction interpreted as consent, determines permission for the website to collect, store and process user data.

The use of cookie banners is particularly relevant for user consent regarding cookies and other tracking technologies employed for purposes like targeted advertising and personalized experiences (Kretschmer et al., 2012; Santos et al., 2021). However, transparency is paramount in all cookie usage scenarios, including those deemed essential for website functionality, such as authentication and security (Kristol, 2001). Websites are obligated to clearly explain the specific purposes behind data collection, empowering users to make informed decisions about consenting to cookie usage (Kretschmer et al., 2012; Santos et al., 2021). This ensures that users have control over their online privacy and understand how their data is being utilized .

2.2.3 Consent Management Platforms

Data privacy regulations, such as the GDPR, have significantly impacted how websites collect user data. In the EU and other jurisdictions, websites must need to obtain explicit user consent before collecting any personal information (Nouwens et al., 2020; Sanchez-Rola et al., 2019). This requirement particularly affected the user tracking and targeted advertising industry, a major driver of the web economy. To comply with these regulations, websites typically present users with a "consent notice" before data collection occurs. These pop-up dialog boxes require user interaction (consent or denial) to access the website's content (Kretschmer et al., 2012). User decisions are recorded through browser cookies or local storage. This workflow for user consent has fostered the development of a new industry: Consent Management Platforms (CMPs) (Nouwens et al., 2020; Singh et al., 2022).

CMPs are technological solutions that emerged in response to data privacy regulations. CMPs can be viewed as software solutions integrated into websites that collect user consent preferences regarding cookies and data tracking (Hils et al., 2020). Their primary function is to facilitate regulatory compliance for website owners by streamlining the process of obtaining user consent for data collection practices (Hils et al., 2020). This includes consent for both reading and writing information to user browsers and subsequently processing this personal data. Notably, a significant use case for CMPs involves scenarios related to user tracking and complex advertising transactions, such as real-time bidding (Singh et al., 2022).

CMPs offer the following functionalities (Singh et al., 2022):

- Displaying user-friendly cookie consent notices.
- Collecting user preferences regarding data collection such as consent to tracking.
- Setting cookies on the website based on user selections.

The key advantage of CMPs lies in their ease of use compared to building in-house solutions for cookie consent management. This has led to their widespread adoption by websites. A limited number of CMP providers, such as OneTrust and Quantcast, have established dominance in the field, offering standardized templates for cookie consent notices (Hils et al., 2020; Singh et al., 2022).

Google Consent Mode

In response to the concerns about user privacy, Google has commenced the process of gradually eliminating third-party cookies in the Chrome browser. This demands alternative methods for data collection and targeted advertising (Google to end third-party cookies,

2024). Google Consent Mode (GCM) emerges as a promising solution, balancing user privacy with the needs of data-driven advertising. GCM acts as a user-centric communication interface that translates consent choices into actionable inputs for Google services, ensuring data collection aligns with user preferences (Google Consent Mode, 2024). When a user consents, full data is collected else minimal anonymized data would be collected. This facilitates website compliance with data privacy regulations while enabling continued data-driven marketing strategies (Google Consent Mode, 2024).

2.2.4 Transparency and Consent Framework

The introduction of the GDPR significantly reshaped data privacy regulations, particularly in the realm of online advertising (Nouwens et al., 2020; Matte et al., 2020; Ryan & Santos, 2022). This intricate network comprises a multitude of actors: publishers who integrate third-party advertising content within their websites, advertisers and trackers responsible for user data collection and ad display and ultimately, the users themselves (Matte et al., 2020; Ryan & Santos, 2022). A critical challenge arose in the wake of the GDPR: establishing a robust mechanism for obtaining, recording and communicating user consent for data collection and cookie usage across these diverse stakeholders (Matte et al., 2020; Ryan & Santos, 2022).

The Interactive Advertising Bureau Europe (IAB EU) partnered with the IAB Tech Lab to address this challenge by developing the Transparency and Consent Framework (TCF). This framework serves as a standardized, open-source technical solution for websites, advertisers and ad agencies to manage user consent for online data collection on web pages (Nouwens et al., 2020; Matte et al., 2020). Before the TCF, the online advertising industry lacked a unified approach to user consent. Communicating consent information between numerous stakeholders proved to be complex and prone to technical errors, potentially leading to inadvertent non-compliance with the GDPR. Furthermore, auditing the adoption of a consent solution across the entire market was difficult without a common standard (Matte et al., 2020).

The TCF offers a solution to these challenges by establishing a consistent approach to GDPR consent across the online advertising ecosystem (Matte et al., 2020). It enables publishers, ad tech companies and advertisers to communicate user consent choices for EU citizens to all parties involved in the online advertising realm. This includes activities related to targeted advertising, audience measurement and content personalization (Matte et al., 2020; Ryan & Santos, 2022). The framework provides a standardized way for Consent Management Platforms (CMPs) to capture user consent for various purposes related to personal data collection by streamlining the consent process for both website owners and users (Matte et al., 2020).

2.3 User Experience

User experience (UX) encompasses a user's holistic perception of interacting with a system, including factors like ease of use, efficiency and overall satisfaction (Forlizzi & Battarbee, 2004). It delves deeper into the multifaceted nature of user interaction with technology by encompassing user perceptions, feelings and overall interactions. UX acknowledges the subjective and emotional dimensions of engagement (Law et al., 2009). This broader perspective includes not just the user's ability to perform tasks effectively (usability), but also their affective responses (feelings and emotions), sensations (perceived aesthetics and interaction experience) and the perceived meaning and value technology holds in their daily lives (Law et al., 2009). In essence, UX paints a richer picture of human-technology interaction, acknowledging the interplay between objective usability and the subjective experience of users.

The concept of UX has evolved into a comprehensive framework for understanding and designing interactive systems. It acknowledges the multidimensional nature of user interaction, encompassing both the user's perception of a product's various qualities such as instrumental and non-instrumental qualities; and the emotions that arise during use (Forlizzi & Battarbee, 2004). This consideration of the multifaceted nature of user experience fosters a richer understanding of user interaction with technology. This understanding guides the design and evaluation of interactive systems that move beyond mere functionality (Alben, 2009). The focus shifts towards creating systems that evoke emotional resonance and hold meaning within the context of users' lives (Hassenzahl & Tractinsky, 2006). The ISO standard offers a broad definition of UX, focusing on user perceptions and responses (Hassenzahl & Tractinsky, 2006). However, recognizing the limitations of this broad definition, researchers have proposed more specific approaches that delve deeper into how UX can be measured and categorized, providing valuable tools for user-centered design and evaluation (Hassenzahl & Tractinsky, 2006).

Hassan and Galal-Edeen (2017) studied the instrumental and non-instrumental aspects of user experience. The instrumental aspect refers to the user's experience when a product effectively fulfils their functional needs (Hassan & Galal-Edeen, 2017). In other words, it encompasses the satisfaction derived from the product's ease of use and its ability to achieve the user's goals (Forlizzi & Battarbee, 2004). For example, a user might experience instrumental satisfaction if they find a recently used product to be intuitive and efficient. Conversely, non-instrumental aspects pertain to the user's experience that arises from characteristics beyond the product's core functionality (Forlizzi & Battarbee, 2004; Hassan & Galal-Edeen, 2017). These experiences address the user's emotional or aesthetic needs and can include feelings of pleasure, amusement, or even nostalgia triggered by product design or interaction patterns (Gross & Bongartz; 2012; Hassan & Galal-Edeen, 2017; Hassenzahl & Tractinsky, 2006).

User-centred design (UCD) is a well-established approach that prioritises user needs and interests (Chammas et al., 2015). This ensures interactive systems are not only functional but also usable and cater to the user's emotional and cognitive needs. UCD can improve an application's usability so that it is easy to use, understandable, efficient to complete tasks and ultimately be acceptable to the user (Koumpouros, 2022). This translates directly to user experience, a multifaceted concept encompassing a user's perception, emotions, and overall satisfaction during interaction (Forlizzi & Battarbee, 2004). By applying UCD principles,

designers can create cookie banners that are clear, informative and address user privacy concerns, ultimately leading to a more positive, compliant and effective user experience.

2.3.1 Dark Patterns

Interface designs that manipulate users into undesired actions through deceptive elements are known as "dark patterns" (Gray et al., 2021). These practices fall under the broader research area of persuasive design and nudging. Their prevalence has sparked concern within regulatory bodies like the European Union (Nouwens et al., 2020). Data protection authorities have specifically highlighted certain dark patterns, such as privacy-intrusive default settings, hidden privacy-friendly options and deceptive "take-it-or-leave-it" choices, as non-compliant with the General Data Protection Regulation (GDPR) (Almeida & Monteiro, 2021; Habib et al., 2022; Nouwens et al., 2020). These interface elements are designed to subtly nudge users towards actions they might not otherwise take, potentially leading them to unintentionally consent to data collection.

Quantitative studies conducted in the UK and Germany (Borberg et al., 2022; Machuletz & Böhme, 2019; Nouwens et al., 2020) provide evidence that these dark patterns are indeed effective in influencing user behavior and data consent choices. By employing such manipulative tactics in data collection, online platforms undermine user control over their personal information. This creates an uneven playing field in the digital landscape, where citizens have limited power compared to powerful institutions (Rychwalska, 2022).

Confirmshaming is one of the dark patterns which employs guilt inducing or shaming language to pressure users into choosing less privacy protective options (Habib et al., 2022; ; Mathur et al., 202; Schaffner et al., 2022). Another predominant pattern is the unequal path or asymmetric dark pattern which creates an uneven playing field within the interface by making the path to the permissive option significantly easier and more intuitive than the path to the restrictive option (Habib et al., 2022; Mathur et al., 2021). The bad default pattern on the other hand utilizes pre-selected options that favor data collection (Habib et al., 2022; Mathur et al., 2021; Utz et al., 2019). However, the confusing button or deceptive dark pattern employs unclear or misleading button labels and placements, making it difficult for users to understand the consequences of their choices (Habib et al., 2022; Mathur et al., 2021; Utz et al., 2019). The no option pattern does not give users any options for controlling data collection, forcing them to accept or abandon the platform altogether (Habib et al., 2022). Privacy Zuckering tactics such as these obscure privacy-protective settings within convoluted menus making them difficult to find and utilize (Mathur et al., 2021).

In their research, Habib et al. (2022) propose a seven-point framework for evaluating usability in privacy choice interfaces. This framework considers user needs - how well the interface addresses users' specific privacy needs, user ability and effort - how the interface empowers them to make choices with minimal difficulty and user awareness and comprehension - how the interface ensures users are aware of and understand the available options. It also assesses user sentiment - user satisfaction and trust in the platform respecting their choices, along with decision reversal - the ability to reverse decisions easily. Finally, the framework examines nudging patterns - how the interface design itself influences user selection, including potential manipulation tactics that could lead to privacy compromises.

2.3.2 Key Dimensions of User Experience

This research investigates the user experience of cookie consent interfaces, focusing on four key instrumental aspects: 1) usability, 2) findability, 3) usefulness and 4) understandability. By examining these facets, we aim to identify design principles that optimize user interaction with these interfaces while ensuring informed consent and an overall positive user experience.

Findability

Findability plays a vital role in shaping a user's first impression of an interface. Poor findability can significantly hinder their ability to achieve these goals, leading to frustration and potentially abandoning the system altogether (Richardson et al., 2021). Several factors contribute to effective findability. Visual salience is paramount. Interface elements that users need to locate quickly, such as navigation menus or search bars, should be visually distinct from the surrounding content (Forlizzi & Battarbee, 2004; Nielsen, 1999; Richardson et al., 2021). This can be achieved through contrasting colours, clear borders and prominent positioning within the user's viewport/window.

Usability

Usability occupies a central position within UX research. Emerging as a replacement for terms like "user-friendliness" and "ease of use," usability broadly refers to a product's "capability to be used by humans easily and effectively". However, the concept is multifaceted (Richardson et al., 2021). It has four key perspectives: product-oriented perspective which focuses on inherent product characteristics, user-oriented perspective which considers the mental effort and user attitude towards the product, performance-oriented perspective which emphasizes the user's interaction with the product and context-oriented perspective that highlights the importance of the user group, tasks being performed and the environment of use (Sauer et al., 2020). Acknowledging this complexity, the International Organization for Standardization (ISO) defines usability as "the extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use". This definition underscores the importance of considering both objective and subjective factors of usability (Richardson et al., 2021).

Usefulness

At its core, usefulness hinges on a product or system's ability to meet the specific needs and expectations of its target users (Richardson et al., 2021; Shaub & Cranor, 2020). This alignment with user preferences is crucial because it ensures that the system prioritizes the attributes that are most important to users (Li et al., 2023). By understanding and incorporating user preferences into the design process, systems can provide functionalities that directly address user goals and tasks, ultimately creating a more valuable and useful experience.

Marathe and Sundar (2011) identify customization as a key user interface attribute that empowers users to take control and personalize the interface's presentation and functionality. This ability to tailor the interface to individual preferences fosters a sense of control and autonomy, ultimately enhancing the user experience (Marathe & Sundar, 2011). By allowing users to manage their privacy settings and specify their preferences through customization, they gain a strong sense of personal agency within the digital environment.

A truly useful system directly addresses user goals and provides them with value. Usefulness also encompasses a system's ability to provide the necessary functionality to complete user tasks effectively. A system is said to be useful if it is equipped with the features and capabilities that users require to achieve their desired outcomes (Richardson et al., 2021; Shaub & Cranor, 2020). A useful system not only allows users to complete tasks but also facilitates this completion in a timely manner minimizing wasted effort and frustration. A useful system allows users to achieve their goals with minimal steps and cognitive load. Ultimately, a system's usefulness stems from its ability to create value for the user by addressing their needs and improving their overall experience.

Understandability

To ensure effective communication, information and controls presented to users must be easily comprehensible by the target audience (Shaub & Cranor, 2020). Regulations such as the GDPR emphasize the importance of clear and plain language, advocating for a level of simplicity similar to that used when communicating with children. This requires avoiding technical and legal jargon, which can pose a barrier to comprehension for users who lack advanced knowledge in these areas (Tikkinen-Piri et al., 2018).

Readability is defined as the ease with which users can process text, which directly translates to their level of understanding (Yi et al., 2011). The authors further emphasize the critical role of readability within the user experience. They argue that readability directly impacts comprehension, a fundamental aspect of successful user interaction. Several factors influence text readability according to their research. Font size, colour and line spacing play a key role in this aspect. Finally, information presentation aspects such as sentence structure and paragraph organization influence readability which impacts comprehension (Yi et al., 2011).

Shin et al. (2012) define information quality as encompassing unambiguity and completeness. Information completeness refers to the presence of all necessary details required for a user to fully grasp the presented details. Conversely, the absence of crucial details or the presence of ambiguity, where information is not clearly stated or open to multiple interpretations, can significantly hinder user comprehension and lead to confusion and misinterpretations (Ahn & Kahlor, 2023; Ellsberg, 1961; Kulesza et al., 2013).

Furthermore, within the context of understandability lies the concept of information overload. Information overload, as highlighted by Davis (2011), refers to the phenomenon where individuals are presented with an excessive amount of information, exceeding their capacity for effective processing. This can occur when information is overwhelming in quantity, overly complex, or irrelevant to the user's needs (Davis, 2011). Recognizing situations where information threatens to surpass a user's cognitive threshold is crucial, particularly within the area of user experience.

2.3.3 The CUE Model

The Components of User Experience (CUE) model, developed by Thüring and Mahlke (2008), offers a valuable framework for understanding user experience by examining the interplay between three key factors: User Characteristics, Contextual Components and System Properties.

User Characteristics encompass a user's inherent traits and dispositions that influence their interaction with a system. These include attitudes and expectations towards technology, personality factors and even current emotional state (Thüring & Mahlke, 2008). Users possess varying levels of technical knowledge and privacy concerns (Gerber et al., 2018). A user with a strong emphasis on data privacy might approach a cookie consent interface with heightened scrutiny (Gerber et al., 2018). Additionally, current mood and level of urgency can also impact their patience and willingness to engage with the interface (Minge & Thüring & 2018).

Contextual Components refer to the environmental and task-oriented aspects surrounding the interaction (Minge & Thüring, 2018). This includes the physical and social environment where the user interacts with the system, as well as their specific goals and tasks within that context (Thüring & Mahlke, 2008). The purpose of the user's visit (specific task vs. general browsing) and the device they're using (desktop vs. mobile) can influence their interaction with the interface. For example, a user hurriedly accessing a website on their mobile phone might be less inclined to engage thoroughly with a complex cookie consent interface.

System Properties represent the inherent characteristics of the system itself (Minge & Thüring, 2018). The CUE model differentiates between instrumental and non-instrumental qualities (Minge & Thüring, 2018; Thüring & Mahlke, 2008). Instrumental qualities are objective features related to usability, such as suitability for a task, ease of use and controllability (Forlizzi & Battarbee, 2004; Hassan & Galal-Edeen, 2017; Minge & Thüring, 2018; Thüring & Mahlke, 2008). Non-instrumental qualities encompass design elements like visual aesthetics (colour, form, layout) and overall information architecture (Forlizzi & Battarbee, 2004; Hassan & Galal-Edeen, 2017; Minge & Thüring, 2018; Thüring & Mahlke, 2008).
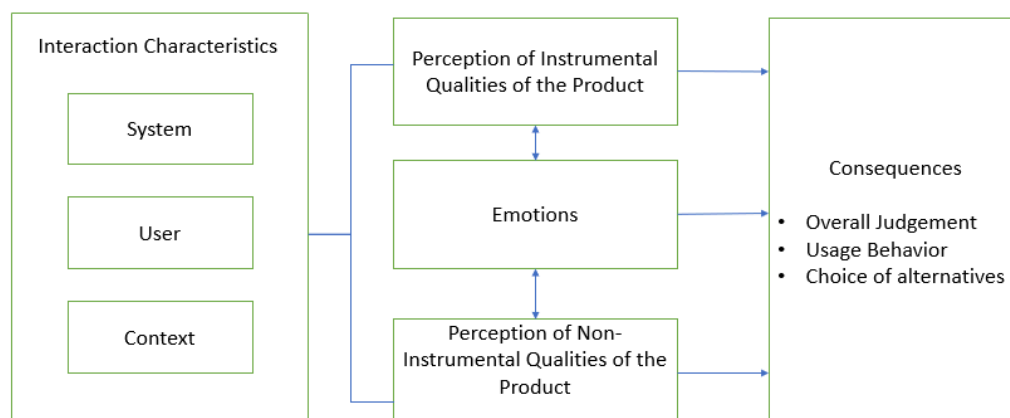
Figure 2.1: The CUE Model - Thüring & Mahlke, 2008

These three factors interact dynamically to shape the user experience. Users perceive both instrumental and non-instrumental qualities (Minge & Thüring & 2018; Thüring & Mahlke, 2008). This perception, along with user characteristics and context, influences the user's emotional response to the system (Minge & Thüring & 2018). Emotions, in turn, can have a feedback loop effect on perception, attention and decision-making (Isen, 2000). In the context of instrumental qualities, the clarity of the consent notice plays a crucial role. Is it easy to

understand what data is being collected and for what purpose? Additionally, the ease of providing consent through clear options (accept, reject, customize) directly impacts usability (Minge & Thüring, 2018). Non-Instrumental Qualities on the other hand, map to the visual design (aesthetics, organization) and language used (clear, concise, target-audience appropriate) influence user perception and emotional response (Minge & Thüring, 2018). Ultimately, this combined user experience leads to an overall appraisal of the system, encompassing the user's general opinion, future behaviour and continued usage (Thüring & Mahlke, 2008).

By analyzing these factors through the CUE model lens, website designers can create cookie consent interfaces that are not only functionally sound (clear, easy to use) but also user-friendly and visually appealing. This fosters a more positive user experience, potentially leading to informed consent decisions based on user characteristics and context. Therefore, the CUE model provides a valuable framework for analyzing and improving user experience in cookie consent interfaces by considering the interplay between user characteristics, contextual components and system properties. By focusing on both instrumental and non-instrumental qualities, website designers can create user-friendly interfaces that facilitate informed consent decisions.

3 Methodology

3.1 Research philosophy

Philosophy offers a valuable outlook to gain a deeper understanding of the empirical world. By embracing philosophy researchers overcome the shortcomings of traditional approaches and explore alternate methodologies, encouraging critical thinking (Lee, 2004). Our research question aims to understand the experiences of users with the cookie preference interface and its impact on their interactions with websites. We are keen on uncovering insights of user behaviors and perceptions in the context of GDPR implementation on websites and not arrive at any generalizations. Our work can be considered as qualitative research as we are studying a socio-technical phenomenon, by inquiring, recording and interpreting the experiences and views of users (Goldkulh, 2012; Patton, 2015). This will enable us to understand the attitude, experiences and perspective of individuals when presented with the option to select their privacy controls. Since the findings cannot be reduced into quantitative figures, a qualitative approach would provide a more nuanced way to conduct the study (Goldkulh, 2012). Several thorough and carefully thought of deliberations by scholars suggest interpretivism as a well-established paradigm for qualitative research (Goldkulh, 2012). In qualitative research, the questions are developed with the purpose of gaining a comprehensive, personalized and contextually sensitive understanding of the experiences and perceptions of the individuals. By understanding diverse views and analyzing the behaviors in a given context, patterns of what individuals do or think can be identified. These patterns and their consequences are results of qualitative evaluation that would contribute to the body of knowledge (Patton, 2015).

Interpretivism paradigm focuses on subjective meanings of persons in specific contexts, whereas the pragmatic paradigm focuses on action and change. Although the results of this study should be a catalyst to simulate the action of improving consent management interfaces, which aligns with the pragmatic paradigm, our research's primary focus is aimed at understanding and interpretation of users' experiences and perceptions. Hence, the epistemological framework suitable for this work would be interpretivism (Goldkulh, 2012; Saunders, Lewis & Thornhill, 2009). While the findings of the study may not be generalizable and objective, adopting the interpretivism philosophy would enable us to consider rich and complex views of individual contexts and experiences. This would allow producing radical understanding and knowledge with multiple interpretations of different experiences (Saunders, Lewis & Thornhill, 2009).

Our ontological assumption is that individuals make incorrect choices on the cookie preference interface due to the complex language being used, information overload and design of the interface not being intuitive in addition to the lack of awareness or clarity of the rights they have with respect to GDPR. The study would focus on the narratives of experiences of different individuals by conducting in-depth investigation (Saunders, Lewis & Thornhill, 2009). Lee (1991), explains phenomenology as an interpretive approach that concentrates on the meaning held by the individual being studied. These meanings are results of their understating which further influences their behaviors and actions. While it has been established that this study is qualitative research by in-depth inquiry, the qualitative inquiry framework – phenomenology would best fit our research question, as this framework attempts to uncover the meaning and essence of lived experiences of individuals (Patton, 2015).

3.2 Research approach

In the previous chapter, we identified phenomenology as the inquiry framework that best fits our research question. Qualitative research strategy gives importance to qualitative data, implying the focus is on words. This method enables us to understand a phenomenon in a given context as it is interpretive in nature. Qualitative research helps in gaining a comprehensive and detailed picture as it considers multiple perspectives. Moreover, qualitative methods help us explore the contexts under which people make certain decisions and act in a certain way (Recker, 2013). A qualitative approach seems to be most appropriate given that this study is aimed at understanding factors influencing users' choices with regard to data protection.

We conducted in-depth interviews ourselves, by focusing on what the interviewees have said, done and experienced. The interview would comprise of open-ended questions that can yield elaborate explanations of opinions, experiences, feelings and understandings. Since the interviews are descriptive in nature, we were able to gain a rich description of perceptions. In order to maintain integrity of the findings, the questions complied strictly to ethical standards. Our research involved content analysis of the data collected and required purposeful sampling (Patton, 2015; Recker, 2013). Since qualitative methods are based on a view that reality is independent of social or historical contexts, the study can be conducted in an objective manner (Recker, 2013).

Additionally, Recker (2013) highlights qualitative research as suitable for phenomenon that are not well explored. There are journals that explore the dark patterns in consent management interfaces and the implementation of GDPR by companies (Gray et al, 2021; Habib et al., 2022; Nouwens et al., 2020; Sørum & Presthus, 2021). However, there is not enough research on users' perspective of GDPR and cookie preference interface, making our research problem a not well researched area.

By our study, we uncovered the perceptions interviewees had about the consent management interfaces and the challenges they face in terms of usability and how it impacts their decisions. According to Patton (2015), qualitative research starts off with a research question that seems as a simple problem, which would evolve gradually into a case study of a complex system with the progression of in-depth inquiry process. Such an inquiry would enable identifying issues in the system along with potential solutions. Therefore, thorough analysis of the data collected helped us in identifying the problems in the current implementations and recommend improvements to enable users to choose privacy preferences with ease. The primary audiences for this research are organizations implementing cookie preferences on their websites and policy makers, as we feel they are the ones who will benefit the most from the empirical findings.

However, we acknowledge the fact that the findings of this study cannot be generalized to the larger population as it is a limitation of qualitative research and replicability is not guaranteed since the results are highly contextual. Another limitation that needs to be highlighted is the possibility of misinterpretation of the data collected due to the beliefs and values of the researchers (Recker, 2013).

3.3 Data collection methods

The chosen method for gathering data in this research is the implementation of semi-structured interviews where the interviewees were presented with three different cookie consent interfaces of varying complexity levels and the questions are grounded in their experiences with these interfaces. Existing IS literature posits that the interview is one of the most important tools in the realm of qualitative research and are consequently frequently employed within this domain (Myers & Newman, 2006). In order to get a holistic view of the user experience to answer the research question set out for this study, it is essential to gather the subjective understanding of the participants.

Bryman (2006) highlights that interviews offer a wealth of detailed information concerning subjective opinions and valuations, making them a fitting instrument for our research investigation. By allowing the use of follow up questions, the semi-structured interviews offer a more flexible approach (Recker, 2013). The questionnaire is pre-established but remained malleable during the interview process to facilitate the discovery of more relevant information. In our role as researchers, the utilisation of a semi-structured approach allows interviews to be conducted in a format that is both flexible and controlled (Walsham, 1995). Recker (2013) also argues that the semi-structured interview is less intrusive and can facilitate reciprocal communication, allowing the interviewer to affirm existing knowledge while presenting an opportunity for new insights, as respondents may give the rationale behind their responses. Lastly, this approach is perceived as more intimate and conversational compared to structured interviews, thereby easing the exploration of delicate topics (Recker, 2013).

However, it is important to consider that while the qualitative interview is an excellent data gathering tool, it is also not without its inherent challenges and complexities (Myers & Newman, 2006). A few of the challenges presented by the authors include the inherently artificial nature of the interview setting, or that the interviewee is tasked with responding, or sometimes fabricating responses, within a constrained time frame. The authors of this study consequently strove to employ face-to-face interviews, seeking to cultivate an elevated level of trust and thereby establishing an environment conducive to honesty and openness. Recker (2013) also notes that inaccuracies in both verbal expression and intended meaning can arise as a result of interviews. The interviews were therefore meticulously transcribed and recordings were maintained. With these drawbacks and counter measures in mind, the benefits of interviews can outweigh the disadvantages, establishing a qualitative approach by the way of interviews as the most suitable approach for this study.

3.3.1 Interview Guide

While quantitative research methods offer limited adaptability, qualitative interviewing necessitates "openness, flexibility and improvisation" (Myers & Newman, 2007). To address this need and gain deeper insights into user interactions with cookie banners, we employed semi-structured interviews. This approach allowed us to introduce new questions and delve into participant-generated ideas, fostering a richer understanding.
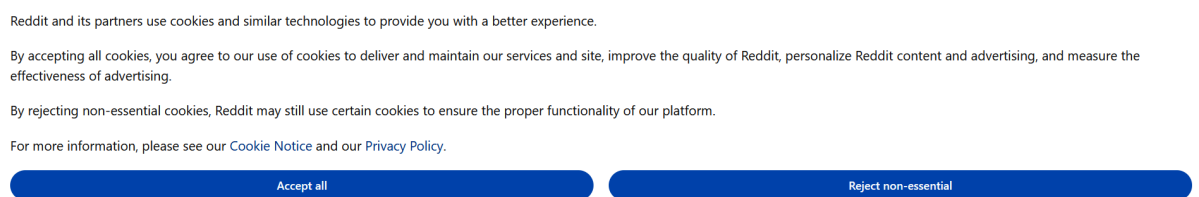
As highlighted by Recker (2013), an interview guide for semi-structured interviews should encompass overarching topics and themes, accompanied by general, thematically-linked questions. Bell, Bryman and Harley (2019) further emphasize grounding the interview guide in existing research alongside the research question and objectives. Our comprehensive interview guide, detailed in Appendix 1, was meticulously developed based on our extensive literature review and served as a cornerstone for conducting the semi-structured interviews.

The interview guide functioned as a roadmap for the conversations, focusing on specific user experience themes like findability, usability, usefulness and understandability. By structuring our inquiries in this manner, we were able to explore each participant's unique experience in greater detail, uncovering insights into the challenges and successes they encountered while managing their data privacy through cookie consent interfaces.

Blocking cookie banners prevents website access until users make a consent decision, while non-blocking banners do not necessitate the same. However, non-blocking banners often allow essential data to be collected without explicit user consent (Habib et al., 2022). Habib et al.'s (2022) research suggests that fully-blocking banners enhance user awareness, whereas non-blocking banners frequently lead to user disregard or inaction. To gain insights into user comprehension and perspectives, we incorporated a combination of both blocking and non-blocking interfaces within our study for participant interaction.

Furthermore, we examined the top 50 most popular websites in Sweden, classifying them based on the level of control they offered. There are three main types:

>   Type 1: Accept/Reject - This is the simplest kind, allowing users to either accept or reject cookies.

Reddit and its partners use cookies and similar technologies to provide you with a better experience.

By accepting all cookies, you agree to our use of cookies to deliver and maintain our services and site, improve the quality of Reddit, personalize Reddit content and advertising, and measure the effectiveness of advertising.

By rejecting non-essential cookies, Reddit may still use certain cookies to ensure the proper functionality of our platform.

For more information, please see our Cookie Notice and our Privacy Policy.

Accept all   Reject non-essential

>   Type 2: Accept/Customize - This kind of banner provides more control, allowing users to accept all cookies or choose to customize their preferences for different types of cookies.

Type 3: Accept/Reject/Customize – This kind offers the most control, allowing users to accept all cookies, reject cookies, or customize their preferences for different types of cookies.

Subsequently, we presented one website from each category to the participants to evaluate their experiences with each type of interface. This approach aimed to highlight user preferences regarding cookie consent interfaces.

3.3.2 Interviews

As highlighted by Chenail (2011), pilot interviews offer valuable insights to identify potential project weaknesses, ineffective interview questions and overly complex methodologies. Hence, we conducted pilot interviews concurrently with the literature review. The data gathered from these interviews will serve a dual purpose: shaping the literature review and refining the interview guide.

Following the initial pilot interview, we iteratively adapted our interview guide based on the participant feedback. This approach, as advocated by Majid et al., (2017) allowed us to assess and refine the clarity, effectiveness and overall suitability of the guide. The feedback focused on question clarity, probing techniques and the guide's overall structure. This iterative process enabled us to optimize the guide for subsequent interviews, ensuring its effectiveness in capturing relevant data.

We followed an iterative strategy where each interview informed the next, allowing us to refine research questions, deepen our understanding of participant perspectives and experiences and delve deeper into emerging themes. As a result, each interview yielded rich and diverse data. Participants' insights and experiences provided in-depth information about their motivations, engagement patterns and perceptions of cookie consent interfaces. This data facilitated a nuanced understanding of the subtleties at play within this context.

The concept of saturation is a cornerstone of qualitative research, ensuring the comprehensiveness of data collection (Fusch & Ness, 2015). Saturation denotes the point at which further data collection yields minimal or no emergence of novel insights. In our research, saturation was achieved after interviewing six participants. This indicates that we have captured the core themes of user experiences within the sample. By analyzing data from a specific target group of participants, we were able to validate and corroborate findings across the user base. This process of cross-validation strengthens the research's credibility and trustworthiness, ultimately leading to a more nuanced understanding of user experiences with cookie consent interfaces.

The interviews commenced with initial questions pertaining to participant demographics, education and work experience. The next set of questions focused on evaluating participants' exposure to cookie consent interfaces. The interview then delved deeper, structured around four key themes outlined in Table 3.2.

Theme one, findability, explored participants' ability to locate the cookie consent banner on a website. Theme two, understandability, assessed participants' comprehension of the textual content and labels used within the banner. Theme three, usability, examined the ease of navigation and the options presented within the interface. Finally, theme four, usefulness, evaluated whether the interface effectively addressed participants' needs. The table below provides a thematic breakdown of the interview questions.

Table 3.1: Interview Guide - Themes

Theme	Question
Introduction	1.1, 1.2, 1.3, 1.4
Exposure to Cookie Banners	2.1
	2.4, 2.5
	2.2, 2.3
Findability	3.1
	3.2
Understandability	4.1
	4.2
Usability	5.1
	5.2
Usefulness	6.1
	6.2
General Reflections	7.1
	7.2
	7.3

The complete set of interview questions used in this study can be found in Appendix 1 – Interview Guide.

3.3.3.1 Respondent Selection

According to Recker (2013), qualitative studies emphasise the use of purposeful sampling strategies, selecting information-rich case studies that can yield valuable insights and profound understanding that can shed light on the research problems. This study explored the perceptions and data privacy practices of young adults with technical backgrounds, a demographic for whom the internet is an integral aspect of their lives.

Following this common wisdom, the demographic of choice for our study is university students of Generation Z who are enrolled in the Information Systems Master's program. Generation Z, born between 1995 and 2010, has grown up with unprecedented access to information. Smartphones, home broadband and school internet connections have put the world's knowledge at their fingertips. They are a generation that is deeply intertwined with the digital world and are constantly navigating data privacy choices (Seemiller & Grace, 2017). Their tech-savviness and technical education ensures familiarity with cookie consent interfaces, while their openness to embrace new technologies provide insights into initial user engagement. They are also accessible and receptive to research participation, presenting a diverse pool of perspectives within a readily available population. Studying their experiences

informs the development of user-friendly privacy solutions for a generation increasingly invested in online autonomy.

In the following table, we present a breakdown of our research participants, including their educational background, work experience and details regarding the interviews conducted.

Table 3.2: List of Respondents

Respondent	Date	Time	Location	Duration	Education	Work Experience
R1	4/18/2024	1700	Online	74 min	MS information systems BS IT	System analyst Data analyst
R2	4/22/2024	1130	Physical	41 min	MS information systems BS information systems	Store Employee Receptionist
R3	4/22/2024	1000	Physical	44 min	MS information systems BS information systems	Computer Lab Assistant Junior Data Engineer
R4	4/22/2024	1330	Physical	40 min	MS information systems BS IT	Front Desk Representative Student Internship Tennis Coach Consultant in sales and marketing
R5	4/22/2024	1445	Physical	46 min	MS information systems BS information systems	Internship in AI solutions Manufacturing worker
R6	4/25/2024	1500	Physical	40 min	MS information systems BS information systems	Computer Lab Assistant

3.3.3.2 Transcribing

To facilitate communication, interviews are conducted in English, a language understood by both researchers and participants. The interviews are audio-recorded and transcribed verbatim using WhisperTranscribe software to capture all the data for subsequent analysis. Additionally, handwritten notes were taken during the interviews to supplement the recordings.

Acknowledging the role of researchers in shaping interview data (Hancock, Ockleford, & Windridge, 2007), we employ descriptive annotations to capture respondents' reactions and emotions within the transcripts. This approach aims to preserve the intended meaning for both the interviewer and participants.

3.4 Data analysis methods

A notable advantage of employing a qualitative method is the substantial volume of data collected, resulting from the transcription of interviews and detailed records developed during and after conducting the interviews (Patton, 2015). To explore the underlying research problems, it is of utmost importance that the collected data is thoroughly analysed to comprehend the relevant data and derive meaningful insights from it (Recker, 2013). The focal point of data analysis in a qualitative approach lies in the act of sense making, prioritising understanding over providing explanations (Bhattacherjee, 2012). To triangulate the data and obtain a nuanced view of the phenomena, Recker (2013) advocated that it is imperative to analyse the interview data in conjunction with the information extracted from the literature to enhance overall comprehension.

With the implementation of the presented data collection method, which seeks to conduct numerous malleable semi-structured interviews, a vast amount of data is expected to be generated, which may pose challenges to manual analysis and comparison, if not render them entirely unfeasible. Of the different qualitative data analysis methods presented by Patton (2015), "coding" is the most suitable method for the analysis and interpretation of the interviews data. According to Recker (2013), coding stands out as the most frequently adopted, widely embraced and immensely beneficial technique for condensing qualitative data into meaningful information. This method of data analysis, which involves the categorisation of data through the application of tags or labels, will facilitate the extraction of meaningful insights, streamline data accessibility, provide structural organisation to interviews and enhance overall transparency (Patton, 2015).

Patton (2015) made a distinction between inductive and deductive analysis. The deductive approach relies on pre-established codes deemed significant in accordance with existing literature, guiding the coding process to concentrate exclusively on predetermined issues. Conversely, the inductive coding approach formulates codes directly from the underlying data, devoid of theoretical preconceptions. Given the objective of the study is to explore user opinions and holistic experience, the deductive approach is deemed unsuitable as it would impose limitations on the scope of findings. The preferred data analysis method should be unbiased, a criterion met by the inductive coding approach. The next step in the process of content analysis, according to Patton (2015), is to reduce the large amount of data into smaller numbers of possible categories, patterns and themes. The author also denotes the difference between the terms pattern and theme, where pattern refers to a descriptive discovery and theme assumes a more categorical or topical nature, providing an interpretation of the meaning inherent in the pattern.

Finally, for the purposes of the study, it is also important to be able to reflect upon the experience of the interview from the perspective of the researcher to fully comprehend the users' point of view. Memoing, as recommended by Recker (2013), emerges as a valuable technique for this purpose. It serves as an effective means of subjectively commenting or reflecting on the occurrences during the interview, capturing the context and nuances of the experience. Therefore, recording impressions and personal reflections from the interview immediately after its conclusion is crucial for preserving the nuances and insights gleaned during the session.

Although our interview protocol effectively assessed core user experience (UX) aspects, we used Thüring & Mahlke's (2008) CUE model to understand the responses and gain deeper

insights into user and system characteristics influencing the experience. However, the controlled nature of the experiment limited our ability to comprehensively evaluate the impact of contextual factors.

While our initial user experience evaluation framework focused on four key aspects - usability, understandability, usefulness and findability; we encountered limitations during the interview process. Interviewee responses regarding these individual aspects often overlapped and were not entirely distinct. To address this, we analyzed and coded the interviews, leading to the identification of new themes. These themes capture the more nuanced factors that influence user experience with cookie consent interfaces.

The following table summarizes the key themes and codes that emerged from the data analysis process.

Table 3.3: Themes & Codes identified during data analysis

Theme	Code
Information Clarity & Comprehensiveness	Language clarity
	Readability
	Insufficient details
	Information Overload
Privacy Attitude & Preferences	Privacy Concern
	Predetermined Preference
	Alignment with preference
User Interaction & Control	Design influences choice
	More interaction
	Customization options
	No reject option
	Option to reverse decisions
	Impact of initial page design
Banner Design & Visibility	Banner Visibility
	Button visibility
	Distracting website content
Perceived Value & Trade offs	Exchanges data for benefits
	Trustworthiness of Website
	Purpose of website
User Characteristics & Context	Emotional state affects interaction
	No or Selective reading
	Interacts when forced
	Understanding of cookies and data collection

3.5 Ethical considerations

While conducting research it is essential to follow ethics, as it encompasses justice, virtue and morality. It helps researchers by guiding them on how to behave and conduct the study appropriately. It lays down rules of responsibility, accountability and liability. Ethical standards are vital in research as it enables the identification of acceptable and unacceptable conduct. Since qualitative studies intrude into the personal lives of the participants, the researchers must be sensitive and indebted to them, as they make adjustments to their priorities and schedules to help the researcher (Patton, 2015). Additionally, to maintain integrity and transparency in the research, one must ensure that only the data relevant to the research will be collected during the study, which will be stored and backed up securely allowing only authorized access. (Recker, 2013).

According to Patton (2015), the researcher needs to understand the purpose of the interview. The researcher must be focussed on gathering high quality data and not stray away from that purpose or try to change participants. The author recommends that the questions should be framed in such a way that it conjures experiences, knowledge, thoughts and feelings that would enrich both the interviewer and interviewee.

Recker (2013) stresses on the importance of ethical considerations in research that involve empirical data collection and human research, as it involves sharing of personal experiences. Since our work is classified as IS research, there is no potential harm to the individuals participating in the interviews as a part of data collection. Ours would be overt research and the partakers of the study will be informed of the purpose of the research. It is recommended to have a consent form (available in Appendix 2) filled in by the participants. Permission for recording responses is needed and in the event of refusal, elaborate notes will be taken (Patton, 2015). However, it is essential to note that the participation in the study is voluntary and will not cause any psychological stress or any harm. The participants are free to withdraw their participation without facing any consequences (Recker, 2013). In order to maintain confidentiality, the responses will be anonymized to safeguard the identity of the respondents as a part of the right to privacy. It is also vital to maintain professional etiquette throughout the process, especially when faced with ethical challenges that occur due to interpersonal relationships or probable conflict of interest (Patton, 2015).

While performing the data analysis, ethical obligations dictate transparent reporting of analysis methods and full disclosure of both positive and undesirable results. It is also important to avoid any data manipulations to support the hypothesis (Recker, 2013). Furthermore, trustworthiness of the results is vital in qualitative research. This can be achieved through respondent validation by having the results of the analysis validated by the participants, which would add credibility and avoid misinterpretations (Birt et al., 2016).

Additionally, the ethical considerations while documenting the research emphasize on recognition of co-author and collaborator contributions; truthful reporting; and avoiding wrongful appropriation or imitation of another author's work as well as use of appropriate vocabulary that is unbiased. To avoid any authorship conflicts and legal action, it is recommended to consult with colleagues and experienced researchers (Patton, 2015; Recker, 2013).

3.6 Scientific quality

According to Patton (2015), the quality of data collected in qualitative research depends on the skill, training, sensitivity and honesty of the researcher. He adds that useful and meaningful findings can be derived by in-depth interviews, systematic observation and content analysis. This requires practice, discipline, creativity and hard work. Qualitative data is said to be of high quality when it is credible, authentic, represents a balanced view of the phenomenon being studied and fair to the participants. In interpretive research, since a human is the instrument of data collection, there is a possibility for bias and errors to creep in. To eliminate such potential problems, the author recommends using systematic data collection techniques, multiple data sources, external reviewers and triangulation.

Scientific quality refers to validity and reliability of the research methods. The quality of the documentation of the research is also equally important, as good results are not valued when they are not well written. Getting the work peer-reviewed by experts in the same field would be one of the ways to ensure quality. Conducting the peer review in a single- or double-blind format where the identity of authors and reviewers are anonymized would eliminate bias in the process (Recker, 2013).

Additionally for research to be considered as good quality, it should have the following attributes – replicability, independence and precision. Research should be well documented, have a detailed explanation of the procedures and findings so that other scholars who are interested in the subject can easily attempt to repeat the procedure and reproduce the same results (Bryman, 2006; Recker, 2013). However, considering that our study is in the IS field, it is important to document the contextual detail as well. Research is said to have independence when it is free from bias and subjective judgement of the researchers. This is a challenging task in interpretive research as it attempts to explain a phenomenon by interpreting participants' experiences. Hence, to eliminate bias external coders can be involved to verify the presence of subjective judgement. According to the principle of precision, the concepts and constructs in the research need to be clearly defined. Precision is critical in interpretive research as other scholars (who are interested in the same problem/ research area) may want to adopt these constructs and concepts, should be able to interpret them in the same manner. Falsifiability does not apply to our work as we are not attempting to develop a new theory (Recker, 2013).

Furthermore, adequate substantial evidence of interpretations in data analysis would add credibility to the findings of the research. Credibility can be maintained by keeping detailed notes of the decisions made during the study, preserving evidence and triangulation. Another key attribute that denotes quality is confirmability, where the findings of the research can be verified by outsiders by referring interview summaries, inferences and conclusions that are derived from the qualitative data (Bryman, 2006; Recker, 2013). If the research has detailed description of the contexts, the findings could be applied to other domains, making the results transferable (Recker, 2013).

4 Results and Analysis

Data analysis revealed key themes and subthemes that will be discussed in this section.

4.1 Information Clarity and Comprehensiveness

During the evaluation of cookie banner text content, a critical theme emerged – Information Clarity and Comprehensiveness. This theme significantly impacted user comprehension of the information presented. The factors such as language clarity, readability, insufficient details and information overload contributed to clarity and comprehensiveness and were therefore identified as sub themes during the analysis stage.

4.1.1 Language Clarity

The use of clear, concise and plain language free of technical jargon or overly complex sentence structures. Although five out of six participants admitted to habitually skipping the cookie banner text, when prompted to read it during the experimental segment of the interview, they all acknowledged that the wording was straightforward and easy to understand.

> *"I'd say that it's written in rather simple language and it's pretty easy to understand. And they state some examples on when they use the data and for what. So it's pretty understandable." (R1:50)*

> *"And then by the buttons here, if it says reject all, then maybe elaborate if it's reject all cookies or reject all unnecessary ones." (R1:86)*

> *"It's not as formal as it could be and they explain it in simple words" (R2:30)*

> *"I think that language was easy." (R3:36)*

> *"The language is easier to understand here, I would say." (R4:61)*

> *"I thought they were quite clear with how the cookie was being used and they didn't use much text, so they were just kind of short sentences and it was quite understandable and clear I would say." (R5:33)*

> *"If you actually read the words which I'm doing now, I feel like they're very understandable" (R6:28)*

Two respondents expressed scepticism regarding the purpose of data collection, suggesting it fostered mistrust. Despite not explicitly consenting to data collection, they perceived their data being gathered regardless.

> *"But do you as a user really trust that that's all it's intent to do? I don't really know. And they also said if you reject or just take the most basic one they can still use*

cookies so you don't really know if it doesn't matter which option you choose." (R5: 35)

"... it says that some vendors which they apparently work with process my data without consent, which is pretty weird. ... So initially, they don't give me a detailed explanation of it. But yet again, I'm not entirely sure what my personal integrity, on what level they are on" (R4: 76)

4.1.2 Readability

The ease with which users could understand the presented information which is influenced by factors like font size, spacing, text formatting and overall layout. One respondent indicated that the chosen font size and colour scheme made it difficult for them to read the cookie banner text.

"The text is a little small. I don't think it's smaller than the other pages, but for me, I feel like it's a little harder to read maybe due to the colours" (R3: 68)

Three participants found the cookie banner text presented as a single, lengthy paragraph to be difficult to read. They expressed a preference for shorter sentences and bullet points, suggesting that a more concise and visually organized format would enhance readability.

"I do prefer it as in the previous two websites when it was separated by parts so it's easier to comprehend and easier to read, kind of like bullet points or something. Because I think this one big block of text would imply that people would be less likely to read actually the text because it seems like a lot to read and it's easy to get lost during reading." (R1: 106)

"I don't believe it's efficient to write it in this way, in one single paragraph." (R2:68)

"I would also say that the language is quite easy. But I think the other ones had more like paragraphs or maybe subheadings and this is just like one text. So maybe it would be a little harder compared to the others to read this one. Since it's just one big paragraph with a lot of text." (R3:70)

A potential design suggestion for improving the salience of important information was found in the response of one of the participants who expressed the benefit of using quotation marks to draw attention to critical portions of the text within the cookie banner.

"Yeah, like the last sentence has these quotation symbols. And I think that it also kind of draws the eye to those, which is just a sentence about what pressing the different buttons would mean. ... I think that quotation symbols kind of guides your eye towards that part as well since it kind of stands out from the rest of the text" (R3: 74)

4.1.3 Insufficient Details

The absence of necessary specifics or incomplete information could leave users confused and unable to make informed decisions. Participants found the information provided on cookie banners to be ambiguous, particularly when encountering options like "Reject non-essential,"

"Reject," and "Reject All." While the Reddit banner explained the concept of essential cookies, the banners on weather.com and twitch.tv left users confused. The lack of upfront information on the initial banner screen regarding the implications of different choices further contributed to user uncertainty.

> *"... And then I will be honest, at the page where you select your choices, it seems a little bit confusing that it says that it needs essential cookies for the website's work. So I would expect that there would be an option that I must choose here. But there's also an option to reject all. So I don't fully understand if there really is an option to reject all of them, or are they still going to use the essential ones when I press reject all?" (R1: 84)*

> *"I don't really understand what functionality they need the cookies for" (R6: 31)*

> *"...I clearly don't want to do that but here there's also a reject all which I don't know if it rejects I mean they probably still have some sort of non-essential or essential cookies but like labelling the button reject all makes me feel like I reject all the cookies not just the non-essential ones" (R6:47)*

> *"... rejecting comes with usage of essential cookies as well, so there you don't really know what you're rejecting. " (R5:81)*

Further contributing to the ambiguity of the information presented, some participants expressed that the cookie banner text lacked sufficient detail for a thorough understanding. This lack of clarity made it difficult for them to grasp the full implications of their choices regarding cookie acceptance and its impact on website usage, potentially hindering informed decision-making.

> *"Not if I would want more information about my choices. But useful in terms of it's it's easy to understand okay they if I accept they will collect cookies in order to maintain services and site improve the quality yeah and so on and so it's easy to understand the like basic things about cookies but if I want to go deeper into like, okay, how does this affect me? Can I customize it in some way? Then it lacks, in my opinion." (R2: 40)*

> *"Maybe not on like a deep level but on a surface level what, Yes. Yeah, I think, like I said, it touches the topic on the surface, but not on a deeper level. It doesn't provide maybe a deeper understanding about that." (R3:48)*

> *"I'm not entirely sure what rejecting here would mean. Am I not eligible for using the service at all, or am I just rejecting to non-essentials again?" (R4: 87)*

4.1.4 Information Overload

The presence of excessive information that could overwhelm and confuse users, hindering their ability to find what they need. Two participants found the amount of information presented in the cookie banner excessive, leading to disengagement. One participant explicitly stated that the information overload discouraged them from reading the text altogether, experiencing feelings of overwhelm. This highlights the potential negative impact of excessive information within cookie banners which could potentially hinder informed decision-making regarding cookie consent.

"First of all, it's a lot more text on this one, so I don't want to read it because it takes too long." (R6: 43)

"They give me a lot of information and that's good, but at the same time, it could be too much. Because when my only purpose is to go to this website, I wouldn't read this stuff." (R2:52)

"I would not go through this. It's a bit overwhelming since it's a lot of information." (R2:36)

4.2 Privacy Attitudes and Preferences

Another prominent theme that emerged during the analysis was Privacy Concerns and Preferences. This theme significantly impacted how users interacted with cookie consent interfaces. Privacy concern, predetermined preferences and alignment with preference are the key factors that were found to be contributing to this theme.

4.2.1 Privacy Concern

Concerns and anxieties about how data is collected and used by websites influence the manner in which users engage with cookie banners which would directly contribute to informed choices regarding data sharing. In our research we found that four out of six participants reported a lack of significant personal concern regarding their data being collected by websites. However, few acknowledged that discussions with peers and the broader social context sometimes trigger thoughts about data privacy. Although these thoughts did not impact their interactions with the cookie consent interfaces, they suggest a disconnect between awareness and actual engagement with privacy concerns.

"I'd say my concerns are moderate. I am not concerned like every time I go on the web, but sometimes." (R1:16)

"Actually when I use or when I'm on the internet I wouldn't say I have that in mind very much but Of course, when I hear people in school and people on the internet talking about that, I maybe put some thoughts into it. But when I'm using the browser, I wouldn't say I think about that as much as I maybe should." (R2:12)

"It's okay. Collect whatever you like." (R2:38)

"I wouldn't say super concerned like I've heard about people maybe getting like hijacked or money taken but I would say internet is such a big part of my everyday, so I'm generally not that concerned when using it. I'm trying to be cool about it." (R3 : 10)

"We often have a discussion topic regarding perhaps not cookies but the integration of Siri and other stuff which collects data without your consent, I guess. But about my safety concerns, no, not really. I'm aware but I'm not concerned as of now at least." (R4:16)

Two participants expressed a heightened sense of caution while navigating the internet. One individual specifically mentioned a shift in their privacy attitude over time, indicating they have become more cautious than they were previously. This suggests an evolving awareness of potential online risks and a growing concern for data privacy.

> *"I would say that I would like to be private on the internet. And about my digital footprints I would like it to be as small as possible." (R5:13)*

> *"Yeah, I would say that I've become more concerned over the last few years because when I was younger, I didn't really care that much at all … But now I usually, sometimes you could kind of customize what cookies you agree to…" (R6:12)*

While some participants did not express immediate concerns, their online behavior and attitudes can be influenced by external factors. Societal discussions about data breaches, changing regulations, or personal experiences with data misuse can trigger a shift towards a more cautious approach to online privacy.

4.2.2 Predetermined Preference

Users often have predetermined preferences regarding data privacy. These preferences shape their expectations and influence their interaction with cookie banner options. Five of six participants exhibited a clear preference for rejecting cookies whenever that option was available, suggesting a general desire to minimize data sharing. However, when presented with a default "Accept All" option without a readily accessible "Reject" option, they would reluctantly accept the cookies. This behavior, as one participant expressed, highlights a preference for quick and effortless choices, creating a potential conflict between user preference and offered options. Additionally, the lack of desire to spend much time customizing settings further emphasizes this preference for convenience, potentially leading to unintended data sharing when "Accept All" is the default.

> *"I typically either reject if there is such option or I press the only necessary cookies. But if there's the option where you can go through the settings yourself I don't spend that much time I accept if that's the case" (R1:24)*

> *"And then my choice would probably be accept all because me as a person, I'm just like, accept." (R2:38)*

> *"As I told you. Well, at first, when they started appearing, I accepted them. .. . I've just been continuing using Reject All as my only interaction with cookie banners, honestly." (R4:21)*

> *"First, I would like to just reject them, because then it feels like they don't take data from you. But then, if that's not possible, I'll just accept the basic requirements. I usually don't press the accept all button, just to have a little bit integrity, I guess." (R5:19)*

One participant prioritized rejecting cookies if the option was available, otherwise, they opted for customization. While this participant still prioritizes rejecting non-essential cookies, they acknowledge the possibility of customizing their choices when presented with the option. This

suggests a willingness to engage with cookie settings for more granular control over data sharing.

> *"I would say probably the first one because it's easy to just reject all the non-essential cookies which is what I would go for"* (R6:67)

> *"But now I usually, sometimes you could kind of customize what cookies you agree to. And then I might often just accept the necessary ones and decline everything else."* (R6:12)

4.2.3 Alignment with Preference

Cookie banners that align with user preferences are more likely to encourage positive user engagement and acceptance. Two participants expressed a clear preference for the "Reject" option when presented with cookie banners. This preference translated into user satisfaction when the "Reject" option was readily available upfront. Conversely, participants exhibited dissatisfaction with banners that lacked an easily accessible "Reject" option. This finding highlights the importance of prioritizing the "Reject" option within the cookie banner design to ensure user satisfaction and a sense of control over data sharing.

> *"Well, it does say reject non-essential, so that would be the one I would be clicking. So I'd say yes."* (R1:44)

> *".. it does not display on the first page um I believe that all of the possible options should be displayed in the first page except for the one where you can change your choices because it requires more space and more settings so that's okay to be in another page but the other most used options should be at the first page."* (R1: 92)

> *"I would say... No. Because I would like the option to reject all the cookies."* (R6:36)

4.3 User Interaction and Control

The "User Interaction and Control" theme delves into the usability aspects of cookie banners, specifically their design, user interaction flow and the level of control offered through available options. Insights into user interaction with cookie banners and the effectiveness of these interfaces can be derived by analyzing these factors. Analyzing the responses of the participants revealed the following as key sub themes that relate to user interaction and control: design influences choice, more interaction, customization options, no reject option, option to reverse decisions and impact of initial page design.

4.3.1 Design influences choice

While one participant expressed that they trained themselves to not fall for highlighted options and felt that they could exercise their decision without being distracted by the nudging, another participant expressed that they make a conscious effort to stop themselves from clicking on the highlighted option.

"I know that some websites do have their preferred option highlighted. Well, that would be accept all. But I think by going through so many cookie banners and going through them every day, I have trained myself not to fall for the highlighted buttons. So yeah, I usually can spot very easily and quickly when the website tries to nudge you to accept all." (R1: 58)

"Yeah, it does. Because when I switch tabs, my initial instinct was to click the big blue button Accept all. But I need to stop myself from doing that. So I would say that would influence my options. It does really." (R4:72)

Three found themselves clicking on them despite not aligning with their preferred choice.

"I would probably pick the one, uh, dark, more like with the, the highlighted. Cause it draws, it wears, it's where the eyes go, goes, or it draws attention to the eye." (R3:58)

"... like the accept all button with the highlighted dark blue. Especially on the phone, if you get that banner, you would just from the start just press it because it's highlighted. You want to go to the website as fast as you can. You don't really read the cookie banner." (R5:58)

"I almost closed the cookie banner just by reflex. But yeah, I'm in. And I was about to click accept in this case. Yeah, because there is only one option here. Or one, like, highlighted option." (R6:37)

However, one participant even perceived such nudging as a positive factor, saving them time and reducing the cognitive load associated with decision-making. This highlights the effectiveness of design elements like highlighted options in influencing user behavior, even when users are aware of their persuasive intent.

"The accept all option is of course more noticeable since they have, yeah, it's blue and the manage cookie settings yeah it's just a text with a text that is underlined so for sure accept all is the most easiest choice to pick and that's probably why I always choose that choice because it's it's often the most easiest one and it's often that choice that is easiest and takes less time to choose." (R2:56)

One participant perceived the use of playful icons within the cookie banner as diminishing its seriousness. This perception led them to feel more comfortable accepting cookies.

"It once again with a cookie with sunglasses. I would say that it directs through a bit of playfulness on the side and it's like as I said before, it takes away the seriousness of data collection and it's wrapped in something playful and maybe that's easier to accept than if it's just corporate text. So that design aspect is very interesting." (R5:74)

From the above quotes it is evident that cookie banner design can significantly influence user behavior and the exercise of their data privacy rights. Neutral designs, devoid of nudges, empower users to make informed choices. Conversely, dark patterns like highlighted buttons emphasizing unrestricted data collection create mistrust. Additionally, highlighting the "Accept All" option, often the most prominent, attracts unintended clicks due to its visual salience. While some banners offer easy navigation, accessing the "Reject" option may require extra steps, leading users to prioritize convenience to accept by default. Furthermore, users

may prefer accessing the site without consent, as seen in non-blocking banners. This overall skewing towards the "Accept" option, with highlighted buttons and less prominent "Reject" options, potentially hinders informed consent.

4.3.2 More interaction

User interaction with cookie banners should prioritize speed and efficiency. Users generally avoid extensive customization, perceiving it as time-consuming and laborious. This suggests a preference for streamlined interfaces that minimize cognitive load and guide users toward a quick decision without requiring complex customization options. Given below are the quotes from respondents that resonate this ideology.

> *"I don't want to waste my time into going other pages and then reading all of the settings" (R1:74)*
>
> *"... it has actually happened that I accidentally clicked on customize or maybe reject or something and then it like takes me to another page and I have to customize it or I have to answer and that was just very frustrating since I just wanted to go fast" (R2:86)*
>
> *"...if you press Manage, then it's like a lot of effort" (R3:52)*
>
> *"From my point of view, it would take much for me to go in and customize my cookie options in order to give consent to one type of data or some kind of companies and reject others. So it must be so much easier to either accept or just reject all. So that's how I feel about it." (R5:72)*

One respondent who favors customizing cookie settings indicated that they only do so when they have time to spare, suggesting a potential trade-off between preference and convenience.

> *"... if I'm in a rush or anything like that I just want to get to the website as soon as possible" (R6:14)*

Complex interaction flows involving multiple pages or lengthy customization options create frustration and hinder user experience. Instead, clear and readily available options like "Accept All" and "Reject All" are preferred, with the ability for granular customization offered as a secondary feature. This emphasizes the need for cookie banner design that prioritizes simplicity, minimizes interaction steps and caters to users seeking a quick and efficient consent process.

4.3.3 Customization options

This element focuses on the ability of users to personalize their cookie preferences. Granular control over accepting or rejecting specific cookie categories empowers users and fosters a sense of control over their data. The absence of a customization option leads users to express dissatisfaction and explicitly notice its absence as seen in the quotes below.

> *".. I guess there should be just another third button added that provides the option to change the preferences." (R1:48)*

"... I have no customizable option here" (R4:50)

"I could take what boxes I want to accept and like they clearly state the purpose of each box which is, I would say good because then you could accept whichever cookies you want" (R6:45)

"When you have the customizable option, I think it gives me a sense that I can control my privacy a bit more at least." (R4:110)

These quotes reflect that users strongly value the presence of customization options in cookie banners, irrespective of whether they use it or not.

4.3.4 No reject option

The absence of a clear "Reject" option significantly hinders user control and can lead to dissatisfaction. Users who prioritize data minimization expect a readily available way to decline all non-essential cookies. Half the participants exhibited a strong preference for rejecting all cookies, interpreting the "Reject All" option as implying the absence of any data collection, including essential cookies.

"... it says reject non-essential, I would be looking for an option that says reject all." (R4: 51)

"... there wasn't a straightforward button saying reject all" (R1:72)

"... they didn't have the reject all option" (R5:46)

These quotes highlight the user's expectation of a clear and readily available "Reject All" option within the cookie banner, ensuring complete control over data sharing. Additionally, the absence of a straightforward "Reject All" button and its lack of prominent placement within the initial banner view were noted as points of disappointment.

4.3.5 Option to reverse decisions

The ability to easily undo or modify initial choices further enhances user control. This flexibility allows users to correct mistakes or adjust their preferences without starting over, fostering trust and encouraging engagement with the cookie consent process. Two respondents expressed a clear expectation and appreciation for the functionality to revisit and adjust their prior cookie preference selections.

"... I don't know if I can go back from this, but I think the other option, to alter the choices was not highlighted." (R1:72)

"... I could probably change that afterwards I'm guessing so if I want to allow something new or remove something I guess I could do that if my interests change" (R6:65)

4.3.6 Impact of initial page design

A well-organized layout with frequently used features easily accessible sets a positive tone and encourages users to engage with the banner positively. Three participants stated that the absence of a "Reject" option on the initial banner page led them to accept cookies despite potentially preferring otherwise.

> *"...there wasn't a straightforward button saying reject all or accept only the necessary." (R1:72)*

> *"... I would have just pressed Accept All at the very first page..." (R1:74)*

> *"So I mean that's the first thing that stands out that to reject the cookies I need to click on manage cookie settings and then go one step further and click reject all instead of having an option available directly to reject all." (R4:65)*

> *"I would say that giving the option to reject straight away would be a good thing. I understand why they don't do it because they want you to accept the cookies and not giving the option straight away makes people accept it more I think as I said before I mean I was close to accepting it just yeah just you know because that happens sometimes" (R6:71)*

When all options not available on the initial screen, users chose the convenient option when the options presented didn't align with their preference. This led them to choose less protective options. The expectation was that all options should be presented on the initial screen of the cookie banner.

4.4 Banner Design and Visibility

The theme of "Banner Design and Visibility" encapsulates various aspects related to the visual presentation and discoverability of cookie consent banners on websites. This includes factors such as the overall visibility of the banner within the webpage layout, the prominence and clarity of buttons or options presented to users and potential distractions caused by other website content. These design elements play a pivotal role in guiding user attention and interaction with the consent interface, ultimately influencing the effectiveness of the banner in communicating privacy choices and obtaining meaningful consent.

4.4.1 Banner Visibility

Banner visibility refers to the ease with which users can spot and recognize the cookie consent banner when navigating a website. It encompasses factors such as the banner's visual contrast against the website background, its size and position on the page and whether it is blocking or non-blocking in nature. Participants in the study consistently reported that banners with high visual contrast, prominent placement and sufficient size were easier to locate and engage with. Blocking banners, which obscured the main content of the website until a choice was made, were found to be particularly noticeable and effective in capturing user attention. One participant highlighted the effectiveness of a banner placed at the top of the page, stating,

> *"Yeah, it was easy to see since it was on the top of the page." (R3:22)*

This observation underscores the importance of banner placement in ensuring visibility and encouraging user interaction. Similarly, another participant noted the impact of a blocking banner that restricted access to the website until a choice was made:

> "*Yes, as I just said, it kind of blocks out the rest of the screen. Even though it doesn't cover your whole screen, it kind of restricts you from using the site, which I would say is worse than Reddit.*" (R6:39)

This suggests that blocking banners, while potentially more intrusive, are highly effective in garnering user attention and prompting engagement with the consent interface.

Participants also identified instances where banners blended in with the website's colour scheme or had a less prominent position, making them harder to discern, even if they were relatively large in size. One participant observed,

> "*It's not a color that, it's not a popping color. So it's pretty well like integrated with the colors on the web page so maybe that makes it not as visible but at the same time it's covering a big part of the page so it will be hard to miss.*" (R2:28)

This highlights the importance of using contrasting colours and ensuring sufficient visual differentiation between the banner and the website background to enhance visibility. The same participant further elaborated on the issue of banner visibility, stating,

> "*At first, I didn't even see it, actually. Probably because of the color, maybe. Because it's... It's well integrated with the colors on the page.*" (R2:64)

This experience underscores the potential for banners to go unnoticed, even when they occupy a significant portion of the screen, if their visual design is not adequately differentiated from the website's overall aesthetic.

4.4.2 Button visibility

Button visibility plays a crucial role in guiding user interactions with cookie consent interfaces. Participants consistently emphasised the importance of easily identifiable and distinguishable buttons for seamless navigation and decision-making. The prominence and clarity of interactive elements such as "Accept," "Reject," and "Customise" buttons directly impact users' ability to make informed choices regarding their cookie preferences.

Colour contrast emerged as a key factor in button visibility. Respondents appreciated buttons that stood out from the banner's background colour, making them easily noticeable and clickable. As one participant noted,

> "*The buttons were like a stronger colour than anything else on the page, kind of. So it was easy to see the buttons*" (R3:24).

Another observed,

> "*As I just said I mean it's very clear where to or how to interact because every clickable space is a blue color in my case where the background is black so that's very easy to see*" (R6:24).

These observations highlight the effectiveness of employing contrasting colours to draw users' attention to the interactive elements within the cookie consent interface.

However, some participants encountered challenges when button colours blended seamlessly with the banner background. One respondent remarked,

> *"I would say since the accept button is highlighted, that it makes me want to press that one. Since it kind of looks more like a button than the other buttons, because they kind of blend in with the background."* (R3:78).

This highlights the potential drawbacks of buttons that visually merge with the banner design, as they may hinder usability and make it harder for users to identify and select their desired interaction options.

Participants also noted the importance of button placement and proximity within the cookie consent interface. Having the buttons located in close proximity to the banner text and arranged in a logical manner enhanced usability and reduced cognitive effort. As one respondent mentioned,

> *"I think the buttons aren't as maybe easy to see since they're on the right side rather than underneath the text I think underneath the text would be easier to see and and probably help you navigate but it's still I can see the buttons and I saw them so it's also easy to navigate but it could have been made easier I would say"* (R3:76).

This suggests that strategic button placement, such as positioning them below the banner text, can improve readability and facilitate smoother interaction.

4.4.3 Distracting website content

Distracting website content emerged as a factor that could divert users' attention away from the cookie consent interface. Some participants reported that engaging or eye-catching elements on the website, such as videos or interactive features, competed for their focus and made it harder to concentrate on the cookie banner.

One respondent shared their experience, stating,

> *"I mean, I just tried scrolling on Twitch and I can see contents of Twitch without accepting or rejecting anything and I'm not sure if I would click a stream here if it would show me the stream or if I would need to click accept before I do that. So it's visible but I personally prefer the initial banner going and then being able to access the website. So it would be like the banner would block the screen."* (R4:85).

This observation highlights how the ability to access website content without interacting with the cookie banner can lead to uncertainty regarding the necessity of engagement and potentially discourage users from making an explicit choice.

The presence of dynamic and attention-grabbing content, such as live streams, further compounds the issue of distraction. As one participant remarked,

"*Also, since the webpage, the first thing that pops up for the real webpage is videos of people doing stuff, I would say that the eye kind of goes towards the video rather than the cookie banner.*" *(R3:66).*

This illustrates how engaging website content can draw users' attention away from the cookie consent interface, leading to delayed decision-making or even overlooking the banner altogether.

Moreover, the interplay between website content and banner design can impact user perceptions and behaviour. One respondent noted,

"*Also, since the website was darkened, you couldn't use it if you didn't press any of the buttons. But for personal use, maybe the first one, because I could just scroll past the banner and not have to interact with it.*" *(R3:86).*

This suggests that techniques like dimming or blocking website content until users interact with the cookie banner can effectively prioritise the consent process and discourage users from ignoring the interface.

4.5 Perceived Value and Tradeoffs

The theme "Perceived Value and Tradeoffs" encapsulates the various considerations and factors that influence users' decisions when interacting with cookie consent interfaces. This theme delves into how users weigh the potential benefits and drawbacks of accepting or rejecting cookies and how their perceptions of value and trust shape their choices. The analysis of participant responses unveils three key sub-themes: Exchanges data for benefits, Trustworthiness of the website and the Purpose of the website.

4.5.1 Exchanges data for benefits

One of the primary factors influencing users' decisions to accept or reject cookies is the perceived value they derive from sharing their data. Participants expressed an awareness that allowing cookies often enables personalised experiences, improved functionality and access to certain features or content. This understanding of the potential benefits led some users to view the exchange of their data as a fair trade-off.

One participant articulated this perspective, stating,

"*Yeah, because as I told you, I'm not that scared of my data being collected. In some way, it can even help me. It makes my web browsing more efficient.*" *(R2:42).*

This sentiment suggests that some users perceive the benefits of personalization and improved user experience as outweighing the potential privacy risks associated with data collection.

However, not all participants shared this view. Some expressed concerns about the extent of data being collected and the potential for misuse. Another participant, for example, highlighted the unease they felt when faced with the prospect of sharing location data:

"*But maybe they're like geographically targeted ads you don't want to give away. So maybe it doesn't align to accept the cookies here, actually. Because it feels strange to give away your location. I always press decline when I get that on Google if they want to save my location for a day. So I would actually press no on this one with the information that I read.*" *(R5:60).*

This response underscores the varying levels of comfort users have with different types of data collection and the specific contexts in which they are willing to make trade-offs.

4.5.2 Trustworthiness of Website

Another crucial factor that emerged from the analysis is the perceived trustworthiness of the website presenting the cookie consent interface. Participants indicated that their willingness to accept cookies and share data was influenced by their familiarity with and trust in the website or company behind it. Well-known and reputable websites were more likely to be trusted with data, while lesser-known or unfamiliar websites raised concerns about data security and potential misuse.

One respondent alluded to this distinction when discussing their decision-making process:

"*And sometimes I just also, if I, um, maybe if it's like Google, like a very well known page, I would probably also accept, but I would probably deny it if it was a webpage that like the first time visiting a new webpage, maybe.*" *(R3:16).*

This response suggests that users often rely on heuristics, such as brand recognition and reputation, to gauge the trustworthiness of a website and inform their choices regarding cookie consent.

However, even when interacting with well-known websites, some participants expressed scepticism about the stated purposes for data collection and the extent to which their privacy would be protected. One participant questioned the true intentions behind the data collection practices outlined in a cookie banner, stating,

"*So what Reddit explained that they want to do with the cookies was to get the cookies and then to evaluate their page so it can be a better user experience. But do you as a user really trust that that's all it's intent to do? I don't really know.*" *(R5:35).*

This response highlights the underlying mistrust some users feel towards companies' data practices, even when engaging with familiar platforms.

Other participants also expressed concerns about the transparency of data collection practices, noting,

"*Wait, let me just read a bit here. They also have at the bottom of the initial landing here it says that some vendors which they they apparently work with process my my data without consent, which is pretty weird. ... So initially, they don't give me a detailed explanation of it.*" *(R4:76).*

This response further underscores the scepticism and uncertainty some users experience when confronted with the data collection practices of even well-known websites.

4.5.3 Purpose of website

The purpose of the website and the user's intended interaction with it also emerged as a significant factor in the decision-making process surrounding cookie consent. Participants indicated that their willingness to accept cookies and share data was influenced by the nature of the website, the sensitivity of the information they intended to share and the perceived importance of accessing the site's content or services.

One participant touched on this consideration when discussing their approach to cookie consent:

> "*Since the option of rejecting all is not presented at first sight, I would probably click accept all.*" *(R4:74).*

This response suggests that when faced with a choice between accepting cookies and potentially losing access to a website's content or functionality, some users may prioritise the immediate benefits of access over privacy concerns.

Similarly, another participant elaborated on the role of website purpose in shaping their cookie consent decisions:

> "*So if I want to use the website, I'll have to accept these cookies. For me, that's worth it. But I guess for some people that could be a bit scary. So you would say that depending on how beneficial the website would be, you would choose accept if you think it's... Yeah. So let's say I want to find out something. So I Google something and I go into a random website and a cookie banner covers all of my screen. I'll probably just back out and try another website.*" *(R6:51).*

This example illustrates how the perceived importance of the information or service being sought can influence a user's willingness to engage with a cookie consent interface and potentially share their data.

Other respondents also elaborated further on the impact of website purpose on their decision-making process, stating,

> "*It depends on on how much I'll use the website. I think if it's just some random website I'll never use again I'll probably just ignore it. But if it's a website I know I'm going to use often, I'll interact with it. And sometimes there is an option to dismiss without making a choice.*" *(R6:73).*

This response highlights the interplay between website purpose, perceived urgency and the availability of cookie rejection options in shaping user behaviour.

4.6 User Characteristics and Context

The theme "User Characteristics and Context" encompasses the individual factors and situational influences that shape users' interactions with cookie consent interfaces. This theme explores how personal attributes, such as emotional state and privacy knowledge, as well as contextual factors, like the level of compulsion to engage with the interface, affect users'

decision-making processes and behaviours. The analysis of participant responses reveals four key sub-themes: Emotional state affects interaction, No or Selective reading, Interacts when forced and Understanding of cookies and data collection.

4.6.1 Emotional state affects interaction

Participants' emotional states and levels of urgency emerged as significant factors influencing their interactions with cookie consent interfaces. Users reported that their willingness to engage with the interfaces and make informed decisions was often dependent on their current mood, level of stress and the perceived importance of the task at hand.

One respondent highlighted the impact of stress on their decision-making process, stating,

> "*it kind of depends on the day because sometimes I feel like it's a process to say no like when you say deny all you kind of you know another box pops up and you have to like press all the different things and sometimes you know you just want to get to a page quickly like I want to stress Um, so then I would accept.*" *(R3:16)*

This response suggests that when users are under pressure or in a hurry, they may be more likely to accept cookies without fully considering the implications, prioritising immediate access to the website over privacy concerns.

Similarly, another participant acknowledged the role of stress in their interaction with cookie interfaces, noting,

> "*Especially if I'm in a stress position, if I like have to find something quickly, then like for sure I would just click to get rid of it. Like it has actually happened that I accidentally clicked on customize or maybe reject or something and then it like takes me to another page and I have to customize it or I have to answer and that was just very frustrating since I just wanted to go fast*" *(R2:86).*

This response further underscores how emotional states, particularly stress and urgency, can lead users to make hasty decisions or accidentally engage with options they did not intend to select.

Other participants also recognized the influence of mood on their willingness to engage with cookie consent interfaces, stating,

> "*So it maybe also depends on what kind of mood I am in. Today, the only thing I've done is studied, so I feel quite sharp. So I would probably be more lean towards actually reading some of this cookie stuff. But if I'm in a rush or if I'm cooking food or anything, I'm just looking for a specific part of the website, I wouldn't care.*" *(R4:118)*

This response highlights how users' emotional states and contextual factors, such as the nature of their current activities, can impact their level of attention and engagement with cookie consent information.

4.6.2 No or Selective reading

Another prominent sub-theme that emerged from the analysis is the tendency for users to engage in no or selective reading of the information presented in cookie consent interfaces. Participants reported that they often skimmed or entirely skipped reading the text, focusing instead on the options presented or the visual cues that allowed them to quickly make a decision.

One participant admitted to never reading the text on cookie banners, stating,

> "*I never read them. I only read what is written on the buttons and that's all.*" *(R1:28)*

This response suggests that some users may rely solely on the labels and visual presentation of the options to make their choices, rather than engaging with the detailed information provided.

Similarly, another respondent acknowledged their tendency to selectively read the text, focusing on the most prominent elements:

> "*I would say I only read that like the big parts which is probably like the title and the buttons that are like deny, accept. I feel like that's not really maybe what you should do but yeah.*" *(R3:20)*

This response highlights how users may prioritise the most visually salient aspects of the interface, such as headings and buttons, while neglecting the more detailed explanations and implications of their choices.

Other participants also admitted to not reading the text on cookie banners when asked, despite recognizing that it may not be the most responsible approach:

> "*No, I wouldn't say so. Unfortunately.*" *(R5:21)*

This response underscores the prevalence of no or selective reading among users, even when they acknowledge that engaging with the information more thoroughly might be beneficial.

4.6.3 Interacts when forced

The level of compulsion to interact with cookie consent interfaces emerged as another significant factor shaping user behaviour. Participants reported that they were more likely to engage with the interfaces when they were forced to do so, such as when the banner blocked access to the website's content or functionality.

One respondent described their interaction with cookie banners as dependent on the level of obstruction, stating,

> "*Yes I would still accept it because even though it doesn't cover like the whole page I would still feel annoyed by it just popping up you know so I just get rid of it kind of by accepting it*" *(R2:20).*

This response suggests that users may be motivated to engage with the interface and make a selection primarily to remove the banner and access the website, rather than out of a genuine desire to manage their privacy preferences.

Similarly, another participant acknowledged that the size and position of the banner influenced their decision to interact with it:

> "*If they have a little cross in the top corner, I usually cross it down and not answer either yes or no. I just cross it or close it. But if it covers the entire page, then that's mostly. Also, if it's really big in the bottom and it takes up half the page, even if it's possible to look at the page without it, I would either accept or deny, if the cross thing wasn't available, I think. It's annoying for the eye.*" *(R3:18)*

This response highlights how the visual prominence and level of obstruction presented by the cookie banner can drive users to engage with the interface, even if they would prefer to dismiss or ignore it.

Other participants also elaborated further on the impact of forced interaction on their decision-making process, noting,

> "*I would say that obviously I'm more likely to press anything with the second one because you can't navigate it otherwise. But like with the Twitch one, you can still go through the page and press a live stream or category so there it doesn't feel like you you have to accept the cookies or reject them. Maybe as a Swede you are more inclined to just don't make a choice than taking a stance.*" *(R5:83)*

This response suggests that when users are not compelled to interact with the cookie consent interface, they may be more likely to avoid making a selection altogether, particularly if their cultural background or personal inclinations favour non-engagement.

4.6.4 Understanding of cookies and data collection

Participants' understanding of cookies and data collection practices emerged as another factor influencing their interactions with cookie consent interfaces. The level of knowledge and awareness users possessed about these concepts appeared to shape their perceptions of the interfaces and the decisions they made.

One participant expressed uncertainty about the implications of ignoring a cookie banner, stating,

> "*Um, I would think that if I cross it or just scroll past it, that it would be like rejecting it maybe. Um, so that it wouldn't collect the data. That would be my initial thought about it. I don't know if that's the case, but yeah.*" *(R3:88)*

This response suggests that users' limited understanding of how cookies and data collection function may lead them to make assumptions about the consequences of their actions, potentially resulting in unintended outcomes.

Similarly, another participant acknowledged their lack of detailed knowledge about essential cookies and the implications of rejecting them:

> "*If I were to accept this, I would allow this website to use my user data. I don't really get what the essential cookies are versus the other cookies. I don't know specifically what the essential cookies does. I've come to terms with the fact that I have to agree to them most of the time.*" *(R6:30)*

This response highlights how users' incomplete understanding of the different types of cookies and their purposes may influence their perception of the choices presented in the interface and their willingness to accept or reject certain categories of cookies.

Other participants also expressed confusion about the concept of essential cookies and the ability to reject them, stating,

> "*Allowing all would mean that they can use all of the mentioned data that they say that they collect. And then I will be honest, at the page where you select your choices, it seems a little bit confusing that it says that it needs essential cookies for the website's work. So I would expect that there would be an option that I must choose here. But there's also an option to reject all. So I don't fully understand if there really is an option to reject all of them, or are they still going to use the essential ones when I press reject all?*" *(R1:84)*

This response further underscores how gaps in users' knowledge about cookie categories and their functionalities can lead to uncertainty and potentially misguided decisions when interacting with cookie consent interfaces.

5 Discussion

This chapter will delve into the interview findings, comparing them to the relevant literature and theoretical frameworks presented in Chapter 2. Through thorough analysis of the collected data, we aim to draw meaningful conclusions that contribute to the overall understanding of the research topic. The following table summarizes the key themes and codes derived from the data analysis, highlighting their connection to relevant research within the existing literature.

Table 5.1: Literature mapping with Themes and Codes

Theme	Code	Literature Reference
Information Clarity & Comprehensiveness	Language clarity	Shaub & Cranor (2020); Tikkinen-Piri et al.(2018)
	Readability	Yi et al. (2011)
	Insufficient details	Kulesza et al., (2013); Shin et al. (2012)
	Information Overload	Davis (2011)
Privacy Attitudes and Preferences	Privacy Concern	Bartsch & Dienlin (2016); Prince et al. (2023);
	Predetermined Preference	Bartsch & Dienlin (2016); Prince et al. (2023); Kokolakis (2017); Smith et al. (2011); Young & Quan-Haase (2013); Gerber et al. (2018)
	Alignment with preference	Li et al. (2023), Richardson et al. (2021) and Shaub & Cranor (2020)
User Interaction and Control	Design influences choice	Habib et al., 2022
	More interaction (requires more interaction / steps)	Habib et al. (2022)
	Customization options	Marathe & Sundar (2011)
	No reject option	Richardson et al. (2021); Shaub & Cranor (2020)
	Option to reverse decisions	Habib et al. (2022)
	Impact of initial page design	Habib et al. (2022)
	Banner Visibility	Forlizzi & Battarbee (2004), Nielsen (1999) and Richardson et al. (2021)

Banner Design and
Visibility

	Button visibility	Richardson et al. (2021), Sauer et al. (2020)
	Distracting website content	Hassenzahl & Tractinsky (2006), Law et al. (2009)
Perceived Value and Tradeoffs	Exchanges data for benefits	Gerber et al., 2018
	Trustworthiness of Website	Gerber et al. (2018)
	Purpose of website	Gerber et al. (2018)
User Characteristics and Context	Emotional state affects interaction	Thüring & Mahlke (2008)
	No or Selective reading	Gerber et al. (2018)
	Interacts when forced	Thüring & Mahlke (2008)
	Understanding of cookies and data collection	Bartsch & Dienlin (2016), Prince et al. (2023)

5.1 Information Clarity and Comprehensiveness

Shaub and Cranor (2020) and Tikkinen-Piri et al. (2018) emphasize that user comprehension is paramount under data protection regulations such as the GDPR, which requires the usage of plain language adapted to different audiences. Using plain language minimizes the risk of users unknowingly agreeing to data collection practices they don't fully understand. This principle extends directly to information clarity on cookie banners. Analyzing user feedback on the information presented on the cookie banner reveals a consistent appreciation for the clarity of the language used. Participants described it as "simple," "easy to understand," and containing "short sentences." This suggests the banner effectively communicated information in a way that is accessible to a diverse audience and is in line with the principles stated in the literature.

Additionally, participants found terms such as "Reject non-essential," "Reject," and "Reject All" to be ambiguous, leading to confusion about the specific consequences of each selection. This highlights a prevalent issue identified by Habib et al. (2022) – confusing label patterns that significantly hinder user understanding of their choices. The absence of upfront information on the initial banner screen regarding the impact of different choices further exacerbated user uncertainty. This lack of complete information left users unsure about the true functionality of the "Reject All" option, questioning whether it encompassed all cookies or only non-essential ones. These findings underscore the negative impact of ambiguity and incomplete information on user comprehension, directly aligning with the concept explored by Ahn and Kahlor (2023), Ellsberg (1961) and Kulesza et al. (2013).

Few participants reported difficulty reading the cookie banner due to small text size and unsuitable colour schemes, mirroring Yi et al.'s (2011) findings on the importance of larger text and appropriate colour. User preference for conciseness, including shorter sentences and bullet points, was identified as a potential way to improve readability. This aligns with Yi et

al.'s (2011) principles on sentence structure and paragraph organization for comprehension. However, one participant appreciated the use of quotation marks to highlight critical information, supporting the notion that visual cues enhance salience and user focus on important details, ultimately improving readability and comprehension. Addressing the identified issues related to text size, paragraph structure and the use of visual cues can significantly improve the readability of cookie banners, contributing to better user understanding and a more positive user experience.

Furthermore, the excessive amount of text within the cookie banner discouraged participants from reading it. This highlights the negative impact of information overload on user behavior, aligning with Davis's (2011) notion that users tend to disengage or skim through overwhelming volumes of information instead of actively processing it. Overall, our study highlights the importance of clear, concise language and well-structured information for effective cookie banner communication.

5.2 Privacy Attitudes and Preferences

Our analysis revealed a spectrum of privacy literacy among participants. Half the participants exhibited some understanding of data collection practices and cookie functionality, demonstrating a basic level of declarative knowledge. However, the remaining participants displayed limited declarative knowledge, acknowledging data collection by cookies but lacking specifics and potential consequences. Procedural knowledge was similarly sparse. Only two participants explicitly mentioned employing privacy-protective measures, suggesting a potential deficit in this area for the others.

Interestingly, a positive correlation emerged between work experience in the IT field and privacy literacy maturity. The two participants exhibiting the highest level of literacy also possessed prior IT work experience. This aligns with the contextual component of the CUE model proposed by Thüring and Mahlke (2008), which suggests social factors can shape user experiences and interactions with technology, potentially influencing privacy awareness and understanding.

While two participants expressed some concern about the privacy implications of cookies, their understanding remained limited. The remaining participants primarily focused on the methods of cookie consent, neglecting to explicitly mention data misuse concerns. These findings seemingly contradict prior research by Prince et al. (2023) which suggests higher privacy literacy leads to lower privacy concerns. In our study, despite varying levels of literacy, the majority did not express significant online privacy concerns. This observation suggests the relationship between privacy literacy and privacy concerns may be more nuanced than previously assumed. Further research is necessary to explore the factors beyond privacy literacy that influence individuals' privacy concerns.

Despite exhibiting low to moderate privacy literacy and not expressing significant privacy concerns, the majority of the participants displayed a clear preference for rejecting cookies. Notably, some participants initially expressed dissatisfaction with the lack of a "reject all" option on the main cookie consent banner. However, upon encountering this option on a different sample banner, they expressed satisfaction. This aligns with the concept of usefulness outlined by Li et al. (2023), Richardson et al. (2021) and Shaub and Cranor (2020).

In essence, when users can easily access their preferred option within the interface, they perceive it as useful because it fulfils their needs and minimizes cognitive effort. These observations related to privacy attitudes and preferences align with Thüring and Mahlke's (2008) study, where they highlight how a user's inherent characteristics such as attitudes towards technology and personality traits influence their interaction with a system.

Furthermore, the participant who exhibited a high level of privacy literacy through strong declarative knowledge, surprisingly opted to accept cookies since they lacked concerns about data sharing. This seemingly contradictory behavior aligns with the privacy paradox, as explored by Gerber et al. (2018). Their research suggests that individuals with limited exposure to the negative consequences of data sharing may demonstrate lower privacy concerns and a greater willingness to share information. This could explain the participant's decision to accept cookies despite their high privacy literacy. Personal risk perception also plays a crucial role in shaping privacy preferences. While the individual possessed a strong understanding of privacy risks, their perceived risk of negative consequences may have been relatively low, leading to a lower level of concern about data sharing.

This study revealed a complex interplay between privacy literacy and user behaviour regarding cookie consent. While relevant IT experience boosted privacy knowledge, most participants, regardless of literacy level, preferred rejecting cookies and valued a clear "reject all" option. This highlights the importance of user-centred design and interface usability. A participant with high literacy surprisingly accepted cookies, reflecting the privacy paradox and the role of personal risk perception. Further research is needed to explore the factors influencing privacy behaviour beyond just privacy literacy.

5.3 User Interaction and Control

Our study demonstrates the effectiveness of bad defaults, as defined by Habib et al. (2022). Pre-selecting the "accept all" cookie option and making it visually prominent nudges users towards agreeing to data collection without actively engaging in decision-making. This manipulative nature is further emphasized by a participant who perceived the highlighted option as time-saving and effortless. However, user perception varies. While some participants recognized the nudging effect and made conscious efforts to avoid the pre-selected option, others found it efficient. This suggests the effectiveness of bad defaults is user-dependent.

The research also explores unequal path patterns, exemplified by the absence of a "Reject" option on the initial screen of the cookie banner. This, as Habib et al. (2022) suggest, compels users to accept cookies by eliminating a clear alternative. Strategic positioning of the "accept all" option and not presenting the "reject" option upfront creates an uneven playing field, nudging users towards accepting cookies despite their potential preference to opt out. These practices raise ethical concerns as they manipulate users into potentially unintended choices regarding data privacy, undermining user control.

The reluctance of four participants to customize cookie settings due to the perceived time consumption indicates the trade-off between user preference and convenience. This is further highlighted by a participant who only customizes settings when time permits. However, the value users place on customization is undeniable. Most participants expressed valued

customization options, even if they did not use it. This highlights the importance of offering these options for user agency. The connection between customization and user control is further strengthened by a participant who explicitly linked customization to a sense of control. This aligns with Marathe and Sundar's (2011) perspective on how customization empowers users by fostering a sense of control in privacy management.

Finally, the appreciation for the ability to revisit and adjust cookie preferences aligns with Habib et al.'s (2022) concept of decision reversal. The positive user sentiment towards this functionality suggests it contributes to a more user-friendly experience by allowing users to correct mistakes or change their settings easily.

From our study it is evident that interface design significantly influences user decisions, particularly regarding data privacy. Understanding how dark patterns such as bad defaults and unequal path patterns affect user interactions is crucial to create user-centric interfaces that respect user control and agency.

5.4 Banner Design and Visibility

Our analysis of participant responses highlights the importance of banner visibility in ensuring user engagement with cookie consent interfaces. We found that factors such as visual contrast, prominent placement and sufficient size enhance banner noticeability and encourage interaction. Notably, blocking banners that obscured the main content until a choice was made, were particularly effective in capturing user attention. These findings align with the principles of findability outlined by Forlizzi and Battarbee (2004), Nielsen (1999) and Richardson et al. (2021), who emphasise the importance of visual salience in enabling users to locate critical interface elements quickly. By using contrasting colours, clear borders and prominent positioning, designers can ensure that cookie consent banners stand out from the surrounding content and effectively capture user attention.

However, our study also revealed instances where banners blended in with the website's colour scheme or had a less prominent position, making them harder to discern, even if they were relatively large in size. This observation underscores the need for sufficient visual differentiation between the banner and the website background to optimise visibility, as highlighted by the aforementioned authors.

We also found that participants consistently emphasised the importance of easily identifiable and distinguishable buttons for seamless navigation and decision-making within cookie consent interfaces. The prominence and clarity of interactive elements such as "Accept," "Reject," and "Customize" buttons directly impact users' ability to make informed choices regarding their cookie preferences. These findings align with the principles of usability outlined by Richardson et al. (2021) and Sauer, Sonderegger and Schmutz (2020), who highlight the importance of clear labelling and visual distinctiveness in facilitating user interaction with interface elements. By using contrasting colours and strategic placement, designers can ensure that buttons are easily noticeable and clickable, enhancing the overall usability of the cookie consent interface.

However, we also identified instances where button colours blended seamlessly with the banner background, potentially hindering usability and making it harder for users to identify

and select their desired interaction options. This observation underscores the need for careful consideration of button design to ensure optimal visibility and ease of use, as emphasised by the aforementioned authors.

A novel contribution of our study is the identification of distracting website content as a potential barrier to effective user engagement with cookie consent interfaces. Our analysis of participant responses revealed that engaging or eye-catching website content could divert users' attention away from the cookie consent interface, even when the banner was reasonably visible and well-designed. This finding highlights the potential for competing visual elements to influence user behaviour and decision-making.

While the literature review did not specifically address the impact of distracting website content on cookie consent management, the observed phenomenon aligns with the general principles of user experience design. As noted by Hassenzahl and Tractinsky (2006) and Law et al. (2009), user experience encompasses not only the user's ability to perform tasks effectively but also their affective responses and the perceived meaning and value of the interaction. Distracting website content can potentially undermine the user's ability to focus on the cookie consent decision, leading to less informed choices or disregard for the banner altogether. Our findings also underscore the need for designers to consider the interplay between website content and banner design to ensure that users can effectively engage with the consent interface. This may involve techniques such as dimming or blocking website content until users interact with the cookie banner, as suggested by some participants. By prioritising the consent process and minimising distractions, designers can promote a more conscious consideration of privacy preferences and facilitate informed decision-making.

5.5 Perceived Value and Tradeoffs

Following our discussion on banner design and visibility, we now turn our attention to the perceived value and tradeoffs that influence users' decisions when interacting with cookie consent interfaces. The analysis of participant responses revealed that the perceived value derived from sharing data is a primary factor influencing users' decisions to accept or reject cookies. Some participants expressed an awareness that allowing cookies often enables personalised experiences, improved functionality and access to certain features or content, leading them to view the exchange of their data as a fair trade-off. This finding aligns with the concept of privacy calculus, as discussed by Gerber et al. (2018), which posits that users weigh the perceived benefits of data sharing against the potential risks when making privacy decisions. The observation that some participants perceive the benefits of personalization and improved user experience as outweighing the potential privacy risks associated with data collection supports this notion of a cost-benefit analysis in users' decision-making processes.

However, not all participants shared this perspective. Some expressed concerns about the extent of data being collected and the potential for misuse, particularly in the context of location data sharing. This finding highlights the varying levels of comfort users have with different types of data collection and the specific contexts in which they are willing to make trade-offs, consistent with the nuanced nature of privacy attitudes and behaviours described by Gerber et al. (2018).

Closely related to the perceived value of data sharing, another crucial factor that emerged from our analysis is the perceived trustworthiness of the website presenting the cookie consent interface. Participants indicated that their willingness to accept cookies and share data was influenced by their familiarity with and trust in the website or company behind it. Well-known and reputable websites were more likely to be trusted with data, while lesser-known or unfamiliar websites raised concerns about data security and potential misuse. This finding aligns with the concept of perceived trustworthiness as a key factor in users' data disclosure decisions, as discussed by Gerber et al. (2018). The observation that users often rely on heuristics, such as brand recognition and reputation, to gauge the trustworthiness of a website and inform their choices regarding cookie consent supports the idea that trust plays a significant role in shaping privacy attitudes and behaviours. However, our study also revealed instances of scepticism and mistrust towards companies' data practices, even when engaging with familiar platforms. This finding suggests that the relationship between perceived trustworthiness and privacy decision-making is not always straightforward and that users may harbour underlying concerns about the transparency and integrity of data collection practices, even in the context of well-known websites.

Building upon the role of perceived value and trustworthiness, our analysis of participant responses also indicated that the purpose of the website and the user's intended interaction with it is another significant factor in the decision-making process surrounding cookie consent. Participants reported that their willingness to accept cookies and share data was influenced by the nature of the website, the sensitivity of the information they intended to share and the perceived importance of accessing the site's content or services. This finding aligns with the concept of contextual factors shaping privacy attitudes and behaviours, as discussed by Gerber et al. (2018). The observation that users' cookie consent decisions are influenced by the perceived relevance and value of the website's content or functionality supports the idea that privacy preferences are not fixed, but rather dependent on the specific context of the interaction. Our study also revealed instances where participants prioritised the immediate benefits of accessing a website's content or features over privacy concerns, particularly when faced with a choice between accepting cookies and potentially losing access to the desired information or service. This finding suggests that the perceived importance of the website's purpose can sometimes override users' privacy preferences, leading to a willingness to compromise on data sharing in exchange for the desired benefit.

5.6 User Characteristics and Context

Building upon our discussion of the perceived value and tradeoffs that influence users' decisions when interacting with cookie consent interfaces, we now delve into the user characteristics and contextual factors that shape these interactions. Our analysis of participant responses revealed that emotional states and levels of urgency significantly influenced users' interactions with cookie consent interfaces. Participants reported that their willingness to engage with the interfaces and make informed decisions was often dependent on their current mood, stress levels and the perceived importance of the task at hand. This finding aligns with the concept of user characteristics as a key factor in shaping user experience, as outlined in the CUE model by Thüring and Mahlke (2008). The model posits that users' inherent traits and dispositions, including their attitudes, expectations, personality factors and current emotional state, play a significant role in their interaction with a system. The observation that stress and time pressure can lead users to accept cookies without fully considering the implications,

prioritising immediate access to the website over privacy concerns, supports the idea that emotional states can have a substantial impact on users' decision-making processes. Our study also highlighted instances where participants reported accidentally engaging with options they did not intend to select due to stress or urgency. This finding underscores the potential for emotional states to contribute to suboptimal or unintended interactions with cookie consent interfaces, consistent with the CUE model's emphasis on the interplay between user characteristics and system properties in shaping user experience.

Closely related to the impact of emotional states on user interactions, another prominent sub-theme that emerged from our analysis is the tendency for users to engage in no or selective reading of the information presented in cookie consent interfaces. Participants reported often skimming or entirely skipping the text, focusing instead on the options presented or the visual cues that allowed them to quickly make a decision. This finding aligns with the concept of bounded rationality and decision biases, as discussed by Gerber et al. (2018) in their exploration of the privacy paradox. The authors suggest that limited cognitive resources and inherent biases can hinder users' ability to fully process information, leading to suboptimal privacy choices. The observation that users often rely solely on labels and visual presentation of options to make their choices, rather than engaging with the detailed information provided, supports the idea that cognitive limitations and biases can significantly influence users' interactions with cookie consent interfaces. Our study also highlighted instances where participants acknowledged that their selective reading behaviour might not be the most responsible approach, but still engaged in it nonetheless. This finding suggests a potential disconnect between users' awareness of best practices for informed decision-making and their actual behaviour when confronted with cookie consent interfaces, consistent with the privacy paradox phenomenon described by Gerber et al. (2018).

Shifting our focus to the role of contextual factors, our analysis indicated that the level of compulsion to interact with cookie consent interfaces was a significant factor shaping user behaviour. Participants reported being more likely to engage with the interfaces when they were forced to do so, such as when the banner blocked access to the website's content or functionality. This finding aligns with the concept of contextual factors influencing user behaviour, as outlined in the CUE model by Thüring and Mahlke (2008). The model posits that the environmental and task-oriented aspects surrounding the interaction, including the user's specific goals and the constraints imposed by the system, can significantly shape user experience. The observation that users are more likely to engage with cookie consent interfaces when they are prevented from accessing desired content or features supports the idea that contextual factors, such as the level of compulsion or obstruction, can drive user behaviour in the context of cookie consent decisions. Our study also revealed instances where participants described their interaction with cookie banners as primarily motivated by a desire to remove the banner and access the website, rather than a genuine desire to manage their privacy preferences. This finding suggests that the contextual factor of banner obstruction can sometimes override users' intrinsic motivation to engage with cookie consent interfaces, leading to potentially suboptimal or less considered choices.

Finally, delving into the role of user knowledge and awareness, our analysis indicated that users' understanding of cookies and data collection practices was another factor influencing their interactions with cookie consent interfaces. Participants' level of knowledge and awareness about these concepts appeared to shape their perceptions of the interfaces and the decisions they made. This finding aligns with the concept of privacy literacy, as discussed by Bartsch and Dienlin (2016) and Prince et al. (2023). The authors define privacy literacy as the

knowledge and skills individuals possess regarding their online privacy, encompassing both declarative knowledge (understanding how websites and service providers handle personal data) and procedural knowledge (actions taken to protect privacy online). The observation that participants' limited understanding of cookies and data collection led to assumptions and potentially misguided decisions supports the idea that gaps in privacy literacy can significantly influence users' interactions with cookie consent interfaces. Our study also highlighted instances where participants expressed confusion or uncertainty about the implications of their choices, particularly regarding the concept of essential cookies and the ability to reject them. This finding suggests that incomplete or inconsistent information within cookie consent interfaces can exacerbate the challenges posed by limited privacy literacy, leading to suboptimal decision-making and a reduced sense of control over personal data.

5.7 Future Directions

Our study revealed significant variations in user experiences and opinions regarding cookie banners. The inconsistencies in banner placement and the ambiguity within the presented options, as discussed in sections 5.3 (User Interaction and Control) and 5.4 (Banner Design and Visibility), contribute to user confusion. Furthermore, the lack of mechanisms for users to readily revoke or adjust previously granted consent, as highlighted in section 5.3(Option to reverse decisions), hinders user control over their privacy preferences.

To address these issues, implementing clear and consistent design and language, as suggested in sections 5.1 (Information Clarity and Comprehensiveness) and 5.4 (Banner Design and Visibility), would familiarise users with the process, reducing cognitive load and simplifying decision-making. Frameworks like the Transparency and Consent Framework, which defines technical specifications, can be utilised to regulate cookie banners from both a regulatory and design perspective. This aligns with the findings discussed in section 5.5 (Perceived Value and Tradeoff - Trustworthiness of Website), which emphasises the importance of perceived trustworthiness in shaping users' willingness to accept cookies and share data.

Moreover, regulations should encourage adoption of user-centric solutions like Google Consent Mode to address concerns regarding non-transparent data collection practices, as discussed in section 5.5 (Perceived Value and Tradeoff - Exchanges data for benefits). This integration facilitates the translation of user consent choices into concrete actions, such as anonymizing the collected data, fostering compliance with regulations while simultaneously benefiting both end-users and advertisers. By fostering collaboration between regulators, industry stakeholders and user advocacy groups, privacy regulations can evolve to better address the needs and concerns of users in an increasingly complex digital landscape. This aligns with the core objective of the Transparency and Consent Framework to establish a balanced ecosystem for data privacy.

Considering the issues highlighted in this study regarding the effectiveness of cookie consent interfaces in fostering informed consent, we propose the following guidelines to enhance user experience and encourage meaningful interaction with cookie banners:

> *Prioritize Clarity and Transparency*: Avoid ambiguous language to foster trust and transparency. Present information in concise sentences or bullet points with a readable font size and colour scheme. Focus on essential details for informed decision-making, avoiding information overload.

Optimise Text and Layout: Recognize that users often focus on headings and buttons. Craft clear and intuitive labels for these elements.

Empower User Choice: Offer a neutral design that avoids nudges towards privacy-intrusive options. Present all options (accept, reject, customise) on the initial screen. Additionally, incorporate a mechanism for users to update their preferences and revoke consent at any time.

Enhance Visibility: Employ contrasting colours to ensure the banner stands out from the website background, maximising visibility for both the banner itself and the buttons. In the case of websites with dynamic content, consider a blocking banner to gather explicit user consent.

Addressing Privacy Literacy: Acknowledge the limitations of user privacy literacy and consider educational initiatives to raise awareness about data privacy practices.

Design Consistency for Reduced Cognitive Load: Maintain consistency in the banner's position on the webpage, button labels and language used across all websites. This familiarity minimises user cognitive load, making it easier to navigate the banner and understand the presented options. Consistent design fosters a sense of user control and simplifies decision-making regarding cookie preferences.

Additionally, privacy regulations can be improved by mandating the implementation of standardised cookie consent interfaces that adhere to these principles. By establishing clear requirements for banner design, language and user control mechanisms, regulators can ensure a more consistent and user-friendly experience across websites. This standardisation would not only benefit users by reducing confusion and enhancing their ability to make informed choices but also assist website owners in complying with data privacy regulations.

Through these guidelines and regulatory improvements, cookie banner design can evolve from an annoyance to a valuable tool for fostering user trust and informed decision-making regarding data privacy. As our study has shown, prioritising user experience in the design and regulation of cookie consent interfaces is crucial for empowering users to exercise their privacy rights effectively.

6 Conclusion

This study aimed to answer the research question: "*How do cookie consent interfaces, implemented to comply with privacy regulations, influence users' understanding and decision-making regarding their data privacy?*" Through a qualitative study involving semi-structured interviews with university students belonging to Generation Z, we identified six key factors that shape user experience with cookie consent interfaces: Information Clarity and Comprehensiveness, Privacy Attitudes and Preferences, User Interaction and Control, Banner Design and Visibility, Perceived Value and Tradeoffs and User Characteristics and Context.

Our findings reveal that the design of cookie consent interfaces significantly impacts user understanding and decision-making. Clear, concise language and readable formatting enhance user comprehension, while ambiguous terms and information overload hinder it. The presence of a variety of options, including the ability to reject all cookies and their visibility and accessibility on the initial screen, empower users to make choices aligned with their preferences. However, dark patterns such as highlighted buttons and the absence of a "reject" option can nudge users towards accepting cookies, even when it contradicts their preferences.

This research highlights the importance of considering user characteristics, such as privacy attitudes, literacy levels and emotional states, as well as contextual factors, such as time pressure and the perceived importance of a website, in the design of cookie consent interfaces. Additionally, our study demonstrated the prevalence of the privacy paradox and the adverse effects of dark patterns, revealing their influence on decision making which is consistent with prior studies in the field.

Based on our findings, we propose guidelines for designing user-centric cookie consent interfaces that prioritise clarity, user control and transparency. These guidelines include using plain language, presenting options clearly on the initial screen, offering a neutral design that avoids nudging, enhancing banner and button visibility, addressing privacy literacy and maintaining consistency across websites. We also suggest improvements to privacy regulations, such as mandating standardised interfaces and encouraging the adoption of user-centric solutions like Google Consent Mode.

Furthermore, this research highlights the critical role of cookie consent interface design in shaping user understanding and decision-making regarding data privacy. By prioritising user experience and adopting user-centric design, organisations can foster trust, transparency and empowerment in the digital landscape. As privacy regulations continue to evolve, it is crucial for researchers, designers and policymakers to collaborate in developing solutions that effectively balance user rights and business interests, ensuring a more equitable and privacy-conscious online environment.

6.1 Future Work

While our study contributes to a deeper understanding of user experience with cookie consent interfaces, further research is needed to explore the effectiveness of the proposed design guidelines and regulatory improvements in real-world settings. Future studies could

investigate the impact of standardised interfaces on user comprehension and decision-making across different demographics and cultural contexts. Additionally, research could examine the long-term effects of user-centric solutions, such as Google Consent Mode, on user trust and engagement with online platforms.

Moreover, as technology and data collection practices continue to evolve, ongoing research is necessary to understand how user attitudes and behaviours towards online privacy may shift over time. Future studies could explore the impact of emerging technologies, such as artificial intelligence and the Internet of Things, on user perceptions of data privacy and their interactions with consent mechanisms.

Appendices

Appendix 1 - Interview Guide

Introduction

- Brief introduction about the research project and its goals
- Explain purpose of the interview and that it will involve examining some examples of cookie consent notices

1. Demographic questions

    1.1.   Age
    1.2.   Major (Education)
    1.3.   Work experience
    1.4.   Exposure to UI/UX/HCI

2. Exposure to Cookie Banners

    2.1.   What is your understanding of concepts like cookies, privacy policies, data collection by websites? (Gauge their level of prior knowledge)
    2.2.   What are your concerns generally about your online privacy and data being collected? (Understand their privacy attitudes)
    2.3.   How often do you encounter the cookie banner? (Probe for frequency - daily, weekly etc.)
    2.4.   How do you typically interact with cookie consent banners/notices on websites? (See if they have prior experience/ if they select default options or spend time on configuring the different categories of cookies) Do you interact only when you are forced to (such as the banner blocking the website) or even otherwise? (Reflection of the user's attitude towards privacy)
    2.5.   Do you read the text on the cookie banner? Do you navigate to the links and read the text there?

Cookie Consent Interface Examples (Show the participant the 3 examples across the 3x1 matrix, 1 example at a time for 1 minute each. Ask them to interact/engage with each example as they would on a real website)

Type 1: Accept/Reject	Type 2: Accept/Customise	Type 3: Accept/Reject/Customise
reddit.com (non-blocking)	weather.com (blocking)	twitch.tv (non-blocking)

3.   Findability (focus on the whole banner)

Findability focuses on the ease of locating the cookie consent banner on a website.

    3.1.   Can you describe your initial experience in finding the cookie banner on this website? (Notice positioning/salience)
- What stood out to you during the process of finding the cookie banner? (Evaluate noticeability - like the colouring or shape / size of banner or other visual elements)

    3.2.   Where did you expect to find the banner when first visiting? (Probe expected location from prior experience)

4.   Understandability (focus on the text content)

Understandability focuses on the clarity and comprehensibility of the text content presented in the cookie banner.

    4.1.   How would you describe the language and terminology used in the notice in terms of understandability?(Language clarity)

    4.2.   Describe your understanding of what allowing or denying certain permissions mean. (Consequence understanding)
or
Did you understand the implications of each choice presented? (Probe for what was clear/unclear)

5.   Usability (focus on the buttons/links on the banners)

Ease of use of the cookie consent banner. How easily can the users interact with the cookie banners (e.g. find and select a button, navigate between different pages)

    5.1.   Could you describe your experience navigating and interacting with the cookie banner, such as selecting an option or customising the preference? (Ease of input)
- What usability issues, if any, did you encounter? (Probe for confusion, too many/little choices etc.), for example, a certain option was highlighted, or the options are arranged differently compared to what you are used to.

    5.2.   Can you describe how the design and layout of the banner influenced your ability to select your preferred options? (Look for positives/pain points)
- Were there any aspects of the design or layout that made the selection process easier or more difficult for you?

6.   Usefulness (focus on whether the interface has the features you need to manage/control the data being collected)

Usefulness in this context means how the choices presented in the banners meet the users needs in terms of controlling the kind of data that is being collected.

    6.1.   Did you find the options and information provided in this cookie banner to be useful? Explain why? (Options meeting needs)

- Were the choices relevant and aligned with your privacy preferences? (Preference match) (Ask this question if the candidate is finding it difficult to follow 4.1)
- What information or features (options) were most/least helpful? (Probe for explanations, consent categories etc.) (Follow up Q)
- What are your expectations in terms of configuring controlling data collection? (Perceived control)
- How did the cookie banner presented meet/did not meet your expectation?

7. General Reflections

   7.1. Which example did you prefer overall in terms of user experience? Motivate your choice. (Identify best example)
   - What are the most important factors (of the 4 aspects above) for you in a well-designed consent notice? (Key UX criteria)
   - Do you prefer blocking or non-blocking interfaces? Can you reflect based on the previous criteria to justify your answer?
   7.2. How could the interfaces be improved (in terms of findability/usability/understandability/usefulness)? (Ask for specific UI/UX suggestions)
   7.3. How did these examples compare to the cookie banners you've encountered in the real world? (Real-world mapping)

8. Closing

   8.1. Any other thoughts on improving cookie consent interfaces? (Open feedback)

Thank them for their participation

Appendix 2 - Consent Form

Master's Programme in Information Systems, VT24, Department of Informatics at Lund University

Thank you for taking part in the study investigating the user experience with cookie consent interfaces.

The purpose of our Master Thesis research is to explore how cookie consent interfaces implemented in compliance to privacy regulation impact user understanding and influence the choices they make in relation to their data privacy.

We are using a qualitative research method of semi-structured interviews to gain a deeper understanding of the factors that affect the user experience with cookie consent interfaces and how websites and applications can improve user experience of preference setting to enable users to understand their rights and make the correct decision.

The result of the collected data will be collected, analysed and discussed by the two below-mentioned master students, the work will be evaluated by the below-mentioned supervisor and the thesis will be assessed and graded by an examiner at the department of Informatics at Lund University, at the end of the course.

Participation in this study is voluntary and you have the possibility to withdraw from participation at any time without motivating why.

Your given data is protected and will not be disclosed to any unauthorized persons. We will store recordings and other details in a safeguarded manner. All collected data in the form of photograph/video/sound recorded will be anonymized, coded and transcribed as text. The confidentiality of the collected data is guaranteed. This will be done immediately upon transmission in order to disable any potential for detecting identities of the participants. All collected data will be kept safely so that they may not be linked to any individuals. When the study is completed and the thesis is done, there might be a scientific publication, based on the anonymized data. After the study is finished and eventually published in a scientific journal or conference proceeding, the original data that has been collected will be destroyed.

The results of the study will be published in the thesis and eventually the scientific paper in a confidential manner that will not reveal the participant's identity. The study adheres to the guidelines on research ethics and common laws.

In order to complete the study, it is very valuable for us to receive your consent. Please contact us if you need further information.

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CONSENT (sign the consent or be voice recorded to say YES, I agree)

I have read and I understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Participant's signature _____ Date _____

Investigator's signature _____ Date _____

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AI contribution statement

The following section outlines the AI tools employed in our master's thesis research, detailing their purpose and level of utilization.

Tools: ChatGPT and Whisper.

Degree of use: ChatGPT was used to improve the language and Whisper was used to transcribe the interviews