Measuring and Facilitating Informedness as a Prerequisite for Informed Consent Decisions

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Data protection has emerged as one of the key challenges for users in this century. Although considered important, users frequently struggle to prioritize data protection over competing goals such as access to free services and functionalities of IoT devices. Legal frameworks such as the General Data Protection Regulation (GDPR) and the ePrivacy Directive in the European Union require users to make privacy decisions on a regular basis. Following a "privacy-as-control" principle (as opposed to a "privacy-as-confidentiality" principle, which would require data collectors to minimize data collection), these regulations demand that users provide informed consent prior to data collection and processing. By definition, *informed* consent would require users to understand the implications of their decision. Prior research, however, has shown that users do not engage with the information provided in privacy policies or cookie banners and regularly struggle to remember their consent decisions, even when asked directly after the decision was made. Hence, researchers have argued, these users cannot be considered informed [3–6], which has led to growing criticism of the notice and choice principle [2, 7]. Based on these considerations, I call for novel interaction and design approaches that facilitate users' understanding of the risks and benefits associated with consent decisions.

Research on the notice and choice principle in HCI has mostly focused on whether users read and/or understand the provided information and whether they are able to make consent decisions that align with their intentions. I argue that these approaches measure *informedness* indirectly, as it is assumed that engaging with and understanding the provided information (e.g., what data is collected, who will receive the collected data) enables users to make an informed decision. Likewise, confirming that users made the consent decision they intended to make is interpreted as post-hoc proof that the decision must have been informed. However, if informedness is defined by an understanding of decision consequences, then measuring engagement with information alone is insufficient. Instead, we must assess whether users grasp the specific risks and benefits implied by their choices.

Few studies so far have sought to measure the informedness of consent decisions directly, i.e., by capturing whether users are aware of the risks and benefits that may result from individual decisions. For this, we first require a legitimate set of risks and benefits for the consent decisions that should be considered in a study. In an ongoing research project, together with my collaborators, I aimed to identify such a set for the use case *online tracking*. The most prominent example of online tracking technologies is cookies, although only tracking also includes broader tracking technologies

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such as fingerprinting and tracking pixels. Online tracking is a prominent example of the failure of the current notice and choice principle, as most users perceived consent notices (often also referred to as "cookie banners") more as a nuisance than as an opportunity to actively manage their privacy.

First, in a combination of legal analysis and empirical user study, user perceptions were combined with an evaluation of which implications for a user could legally arise from data collection and processing for the respective purpose. This analysis was situated within the fundamental rights enshrined in the German constitution. The resulting risks for users included:

- Insights into my private life
- Influence on my decisions
- Unequal treatment
- Financial losses
- Impairment of my social relationships
- Impairment of my health
- Unfair treatment in legal proceedings

Benefits were derived through a combination of legal analysis and data generated via expert brainstorming within our research team. The resulting lists included the following benefits:

- Improved website in the future (e.g., more features)
- Higher user-friendliness
- Advertising tailored to my interests
- Time savings
- Financial benefits
- Generally improved product offerings on the market
- Website can be displayed correctly
- Website tailored to my interests
- Higher IT security

Next, we conducted expert interviews with employees from data protection authorities from countries governed by the GDPR or UK GDPR and scholars specializing in data protection and security risk assessment. The experts were asked to indicate which of the risks and benefits were implicated in consent decisions about online tracking for four common data processing purposes: (1) Website Adjustment (e.g., regarding language), (2) Website Statistics, (3) Content Customization, and (4) Ad Customization. They were further asked to add any missing risks and benefits; however, none of the experts suggested additional risks or benefits.

Equipped with such a set of risks and benefits, we can then proceed to measure user informedness in the context of online tracking consent decisions, as users within the GDPR and UK GDPR are required to make on a regular basis when visiting a website for the first time. The easiest option might be to use a survey that captures whether users associate the respective risks and benefits with the data processing purpose as specified within our expert-validated list. We conducted a user study (N=985) to pilot-test this approach [1]. We created a cover story for the study, in which participants first visited a fictitious web shop with a tracking consent notice to facilitate a natural interaction with the tracking settings. Participants were then redirected to the survey, where we implemented the risks and benefits in a 7-point Likert-scale format, asking participants to indicate which of the risks and benefits could have resulted from accepting tracking for the data processing purposes included in the consent notice they just interacted with. The results

indicate that most participants felt able to classify a risk and benefit as either applicable or not applicable for each of the considered data processing purposes, as indicated by few "unsure" responses. Yet, the findings also suggest that most users cannot differentiate between the risks and benefits associated with the different data processing purposes. For example, the majority of the participants thought they could gain financial benefits not only for personalized ads tracking, but also for statistical tracking, which usually analyzes aggregated user data to improve the website, and should thus not imply financial benefits for the individual user. Due to their inability to differentiate between tracking purposes, most participants failed to correctly identify the risks and benefits associated with a specific data processing purpose. This confirms prior research suggesting that users cannot be considered *informed* as required for informed consent decisions.

I thus advocate for future user interfaces (UIs) that directly inform users about the implications of their consent, i.e., the risks and benefits associated with providing or withholding consent. This could be implemented, e.g., by directly integrating textual information in consent notices. Alternatively, it might be promising to further aggregate such information in a textual or visual depiction of the risk-benefit ratio to reduce the cognitive burden for users. Finally, replacing website-based consent notices with consent agents that manage consent across websites — with the option to make exceptions for individual websites as required — could balance the additional cognitive and temporal effort introduced by adding yet another layer of (privacy) information. This might also be promising in addressing privacy fatigue, as users can specify their settings once, in a dedicated time frame, in which the consent decision does not interfere with their primary goal (visiting the website). A challenge in evaluating whether such UIs improve user informedness might be to measure whether risks and benefits can be correctly attributed to the consent decisions (in this use case tracking data processing purposes). When using survey-based approaches as described above, participants might simply recognize risks and benefits from the UI, without genuinely understanding those. Yet, asking participants to freely recall risks and benefits might capture memory rather than understanding. A promising path towards resolving this issue might lie in the careful rephrasing of risks and benefits, i.e., by specifying those in the UI for the use case, and include an abstract list as provided above in the survey.

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