Recommendations and Checklists for Developing More Accessible and Comprehensive Browser Cookie Consent Banners

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***Abstract*—We present recommendations and checklists for enhancing the accessibility of browser cookie banners, based on user testing and survey feedback. The study identifies several key challenges, such as lack of clarity, information overload, and manipulative design. We propose solutions, such as standardized language use, simpler interfaces, and preset browser choices to improve both technical and cognitive accessibility. While the study focuses particularly on the needs of people with disabilities, it effectively aims to enable all users to make informed decisions about their privacy online.**

Keywords-Universal Design; ICT (Information and Communication Technology); Web; Digital Accessibility; Usability; User Experience; Browser Cookies; Privacy.

I. INTRODUCTION

Browser cookies are pieces of data stored on a user's device during web browsing to serve functions like login sessions, language preferences, and behavioral tracking [1]. When used to identify users, cookies are classified as personal data and fall under regulations, such as the General Data Protection Regulation (GDPR) and the ePrivacy Directive (EPD), which require informing users about cookie usage and obtaining their consent [2], [3]. Most websites implement browser cookie consent banners, or short cookie banners, to let users accept or reject all or some cookies.

However, cognitive barriers can lead to difficulties and even total exclusion for some users when accessing websites [4], while digital inaccessibility may exclude users, for example with visual disabilities, and those who rely on Assistive Technology (AT) like screen readers [5]. International regulations and standards address this by requiring all components of public websites, including cookie banners, to follow Universal Design (UD) principles and be accessible to all users [6], [7], [8].

Despite their ubiquity, research on cookie banners has mostly focused on usability, with limited attention to technical and cognitive accessibility [9]. This article addresses that gap by examining the UD of cookie banners, especially for users with disabilities and AT users. Based on user testing of Norwegian websites and a survey, we present recommendations and a checklist for accessible design. The article reviews related work in Section II, outlines the methodology Section III, presents findings in Section IV, and offers design guidance in Section V. The appendices include the checklist and prototype images.

II. BACKGROUND

This article builds on a previous study that presented a literature review and expert evaluations of the accessibility and universal design of cookie banners [10]. The review found that most research focused on user interaction and experience, with limited attention to cognitive accessibility. It also highlighted that technical and cognitive issues in multi-purpose dialogs often create significant barriers, especially for users with disabilities. A key finding was the need for user-friendly, transparent design to support comprehension and ethical decision-making.

The expert evaluation revealed issues, such as semantic markup accessibility errors and poor adaptability across devices and screen sizes. Cognitively, banners often emphasized text structure over clarity, complicating interaction. Many banners also failed to receive focus on page load for screen readers. These findings highlight the need to improve both accessibility and understandability in cookie banner design.

III. METHODOLOGY

We conducted user testing and a survey.

A. User Testing.

We conducted user tests with twelve participants with diverse abilities to evaluate the accessibility and usability of cookie banners on four Norwegian website: finn.no [11], bufdir.no [12], skatteetaten.no [13], and facebook.com [14]. These sites represent sectors, such as e-commerce, civil society, public administration, social media, and online services, and were selected based on a preliminary study [10] to reflect diverse banner designs. Banner screenshots are available in [10]. The tests were facilitated by a researcher and conducted both in person and via video conferencing.

A semi-structured interview protocol guided the sessions, combining task-based interaction with "think-aloud" methods and follow-up questions [15], [16]. Participants were asked to locate, understand, and adjust cookie settings. The protocol allowed for brief deviations to obtain in-depth answers on specific (related) topics. This approach provided insights into their cognitive processes and real-time barriers.

Sessions were recorded and analyzed independently by multiple researchers. Observations were synthesized into themes and discussed among all researchers, reflecting both individual user experiences and common patterns, which are summarized in the next section.

1) User Selection.

The user tests targeted at persons with visual, auditory, physical, and cognitive disabilities. We recruited participants in Norway and Sweden through interest organizations, such as the Norwegian Association of the Blind and Partially Sighted (NABP) and the Pensioners' Association (Pensjonistforbundet), posts on disability-focused online forums on Facebook, and persons registered in the user panel of Stiftelsen Funka.

Twelve users—seven from Norway and five from Sweden—tested the websites. Ages ranged from 15 to over 80. Some had multiple types of disabilities, including no sight, impaired vision, impaired hearing, limited hand manipulation or strength, limited reach, limited cognition, language or learning abilities, and low technology competency.

Users employed various devices, including desktop computers (Windows or Mac with Chrome, Safari, or Edge browsers) and mobile phones (Apple/iOS phones with Chrome or Brave browsers). Assistive technology, such as the VoiceOver screen reader were used by visually impaired users, and one also employed a braille display.

B. Survey

An online survey gathered insights on users' experiences with cookie banners, including ease of reading, consent handling, encountered barriers, and suggestions for improvement. It targeted users with and without disabilities, mainly in Norway and Sweden.

The survey was distributed through civil-society organizations, social media posts(, such as online forums for people with disabilities on Facebook), LinkedIn contacts, and newsletters. Since the survey was sent to an (though thematically limited) undefined audience, it is not possible to calculate a response rate, and the results cannot be considered representative.

IV. RESULTS

"Cookie banner" and "banner" refer to the website interface area containing all cookie and consent elements.

A. User Testing.

We identified three handling patterns among the users:

- Those who consistently accept all cookies (four users).
- Those who, as far as possible, try to reject all cookies (four users).
- Those who choose to accept or reject depending on the context (four users).

All users wanted to handle cookie banners quickly: "I notice them. I do not care about them; I just want to get past them […]." Some ignored banners if they were not intrusive—especially screen reader users.

Several users were unsure what cookies are or why they are needed. About half had a negative view of cookies and banners. None intended to revisit the banner after making a choice, likely because the option was absent on many pages.

No users scrolled to read long cookie texts (e.g., Facebook, Skatteetaten) unless prompted. Many preferred to avoid lengthy settings pages and simply accepted all cookies.

Users found it hard to understand cookie options due to inconsistent wording across sites, requiring repeated learning. Skatteetaten's settings were seen as confusing, with one unclickable checkbox causing irritation. Bufdir's banner was rated clearest, though one user struggled to find it due to its small size, low contrast, and placement in a "blind spot."

Further results are grouped by the four WCAG principles—perceivable, operable, understandable, and robust [17]—plus a section on non-accessibility observations.

1) Perceivable and Robust.

We first examined whether users could detect the banner. Sighted users generally had no issues, though some missed Skatteetaten's banner due to its small size, unusual colors, and graphic design, which made it blend into the page. Most users were not bothered by alternative titles like "Cookie settings" (e.g., Finn).

The experience differed for screen reader users. When the page loaded, VoiceOver (VO) skipped the blocking banner (except on Bufdir) and jumped to the main content, which was unintended since the banner was no longer blocking. It was only detectable using the touch method, where the screen reader reads what is under the user's finger. Some guessed the banner was at the bottom (e.g., Finn), but older users often did not know this. A few appreciated navigating without blocking banners, but we argue banners should be equally perceivable and blocking for all, ideally placed at the top in semantic order (e.g., Skatteetaten). Moreover, two screen reader users noted that after clicking on the banner link, focus landed on the dialog text instead of the heading, causing confusion about their current position within the webpage.

Older users also struggled with inconsistent color palettes and unclear graphics (Skatteetaten), mistaking them for ads ("nagging," "disturbing"). We recommend consistent colors and simple, intuitive icons. On Facebook, the settings link had too small a font and poor contrast.

Finally, a tech-savvy user found that tabs on Finn were not properly coded for keyboard navigation, posing challenges for non-mouse and screen reader users.

2) Understandable and Operable.

We examined how easily users could understand and use the banners. Many faced barriers related to design and functionality. Almost all were overwhelmed by the amount of text and choices. One participant said the banner "stands in the way" of their goal, highlighting the need to minimize interaction time. Most users focused on button text, occasionally headings, and rarely read longer explanations. Long texts were overwhelming ("too much text, almost got seasick"), especially for the braille display user.

Nearly all participants struggled with jargon and vague terms. While "cookies" was acceptable, terms like "ad partners," "purposes," "suppliers," "recommended," and even "all" caused confusion. Participants recommended clearer language, formulated from a user perspective, rather

than a technology-centered one—e.g., "necessary for login" instead of just "necessary."

Visually impaired and older users favored banners that start with brief content and link to more details for "those who want to find out more." Most preferred the banners over separate consent pages. Tabs and accordion menus (e.g., Finn) were helpful when used carefully, as they could otherwise hinder overview.

All participants found the "Reject all" button, even when hidden behind "Customize." However, many noted the banner disappeared without feedback. A short confirmation message was recommended.

Some sites redirected users to different parts of the banner after clicking "Customize"—within the same banner (Finn), a new one (Skatteetaten, Facebook), or a separate page (Bufdir). Most preferred everything in one place, as on Finn. However, Finn solves this by reloading the page, which disrupts screen reader users who lose context and must navigate back.

3) Observations Not Related to Accessibility.

We evaluated whether users could revisit cookie banners after closing them, with mixed results. This was not possible on Skatteetaten. Many, especially older users, were unaware of this option but found it helpful once demonstrated.

Although several participants found footer links acceptable ("that is where it is usually located"), three, including older users, struggled with Finn's auto-scroll, which prevented access to the page bottom.

There was confusion regarding the terms "Cookie," "Privacy declaration," and "Cookie settings" (Finn, Bufdir). The first two provided information about cookie use, while the latter required user interaction. A button labeled "Open cookie settings" could improve clarity.

Two cognitive challenges were identified in changing decisions. First, Facebook's placement of the link at the bottom of an unstructured list required users to search through all links. A column layout, as suggested by one participant, could improve usability. Second, locating cookie settings in Facebook's Privacy Center was demanding.

We also identified several issues that, while not directly related to accessibility, may violate privacy regulations: (1) Cookie settings could not be changed after a choice was made. (2) In practice, the user is required to make a choice regarding cookies to be able to read about their details. (3) Websites informed users about non-optional cookies even when not necessary. (4) Users were not informed that the website could be used without accepting optional cookies. (5) When revisiting settings, users could not retain previous choices without making a new selection.

B. Survey

Here, we present selected results from our report [18]. Detailed results can be found in our Github repository [19].

There were 151 respondents to the survey in total, consisting of 58% women, 39% men, and 3% non-binary individuals. The age distribution was as follows: 3% were 19-30 years old, 25% were 31-49, 23% were 50-65, and 48% were 66 or older. Most respondents used the internet multiple times a day (74%) or daily (24%), and only 2% used it weekly. 74% indicated no disabilities, 24% reported having an disability (or multiple), and 2% preferred not to disclose this information. Among those with disabilities, there were the categories cognition (14 respondents), vision (14, split equally between low vision and blindness), motor (7), mobility (6), hearing (3), and unspecified (1). The following survey results are categorized by themes.

1) Cookie Choice Preferences.

Users' cookie choice preferences were similar between respondents with and without disabilities (cf. Figure 1). Among respondents with disabilities, 50% typically reject cookies, 25% accept without reading the banner information, 19% customize the settings, and 6% ignore cookies altogether. Among respondents without disabilities, the corresponding numbers are 48%, 29%, 21%, and 3%.

2) Perceived General Difficulty.

The perceived difficulty with cookie banners varied among individuals with and without disabilities (cf. Figure 2). Among respondents with disabilities, 50% found cookie banners more difficult than easy to handle (28% found it very and 22% quite difficult), 36% found it neither easy nor difficult, and 14% found it more easy than difficult (6% found it very easy and 8% quite easy). The corresponding numbers for respondents without disabilities are, 41%, (12% very difficult, 29% quite difficult), 36%, and 23% (7% very easy, 16% quite easy).

3) Perceived Readability.

The answers for perceived readability of text in cookie banners revealed differences between user with and users without disabilities (cf. Figure 3). Among those with disabilities, 55% found the text more difficult than easy (19% very and 36% quite difficult), 25% found it neither easy nor difficult, and 17% found it more easy than difficult (11% very easy, 6% quite easy). The corresponding numbers for respondents without disabilities are 44% (13% very and 31% quite difficult), 37%, and 18% (8% very easy, 10% quite easy).

4) Perceived Difficulty in Decision-Making.

Perceived difficulty in decision-making in cookie banners differed quite a bit between individuals with and without disabilities, too (cf. Figure 4). Among those with disabilities, 64% found making decisions more difficult than easy (22% very and 42% quite difficult), 8% found it neither easy nor difficult, and 27% found it more easy than difficult (19% very easy, 8% quite easy). The corresponding numbers for those without disabilities are 44% (10% very and 34% quite difficult), 25%, and 31% (16% very easy, 15% quite easy). Subsequently, we detail results from plain-text fields in the survey.

5) Feedback on Challenges with Cookies.

Out of 151 participants, 107 provided comments on the challenges they encounter with cookie banners.

Generally, users would rather not deal with cookies at all, aiming to bypass cookie banners as swiftly as possible. Many users find cookie banners confusing, bothersome, and time-consuming. Additionally, there are significant challenges tied to the lack of a universally accessible design for cookies. This is particularly problematic for individuals

with disabilities and older adults. Some cookie banners are incompatible with assistive devices. Furthermore, too much text often leads to a cognitive overload for many users. Users reported challenges that can be categorized into four categories: lack of accessibility, lack of clarity, information overload, and manipulation.

Accessibility-related challenges are challenges that hinder their ability to make informed cookie choices:

- Inconsistent interface: The variation in the appearance and location of options causes confusion, making it difficult to locate "Accept only necessary" or "Reject all."
- Inaccessible or unclear interfaces: When buttons are not compatible with assistive technologies or the text is hard to understand, users—especially those with disabilities—struggle to give informed consent.
- Challenges for older adults: Cookie banners are particularly challenging for elderly users, who may find them confusing as they generally struggle to navigate the web.
- Poor mobile adaptation: On mobile devices, cookie banners often cover large portions of the screen, making interaction difficult.
- Small font sizes: Tiny text makes it hard to read and understand cookie information, especially when large amounts of content are presented.
- Vanishing banners: Some banners disappear too quickly, preventing users from responding in time and causing frustration or confusion.

Lack of clarity refers to uncertainties, confusions, or lack of understanding about the information content and the choices presented in the cookie banner, and how they are explained, if at all:

- Unclear purpose: Users often do not understand exactly what cookies are or why they are used.
- Hidden or complex options: Choices, such as "Accept only necessary" are frequently buried behind multiple clicks or long lists.
- Unfamiliar terminology: Terms, such as "legitimate interests" or "necessary cookies" are unclear, leading to doubts about whether consent is genuinely respected.
- Uncertainty about consequences: Users are unsure what happens if they reject cookies, such as which site features may become unavailable.
- Confusion between functions: It is often unclear which settings relate to site functionality versus advertising.

Many users reported experiencing information overload and a feeling of being overwhelmed by the volume, complexity, and presentation of cookie content and choices:

- Complex and time-consuming: Cookie banners are often seen as unnecessarily complicated and tedious to navigate — more annoying than difficult.
- Cumbersome rejection: Users were frustrated by having to tick or untick many boxes and noted that some websites deliberately hide rejection options.
- Too many choices: Users felt overwhelmed by the number of decisions and the volume of information they had to process.
- Excessive text: Long, legalistic language discourages reading and understanding.
- Loss of focus: Cookie prompts disrupt attention and make it harder to engage with the website.

Many users perceived manipulation in the design and behavior of cookie banners, which was seen as pressuring them into choices they would not otherwise prefer, or that may not be in their best interest:

- Manipulative design: Many feel the design encourages cookie acceptance by highlighting "accept all" buttons through color or placement.
- Forced acceptance: Users feel compelled to accept cookies to access the site, frustrated by the difficulty of rejecting or selecting only necessary cookies.
- Lack of control: Users report feeling a loss of control over their data, with some finding it unsettling to accept all cookies and choosing to leave the site. Concerns include what data is collected and why.
- Cookies as surveillance: Some view cookies as spying tools, worried about unclear data collection of personal and geographic data, and potential third-party misuse.

6) Feedback on Improvement Suggestions for Cookies.

109 respondents proposed several solutions for simplifying interaction with cookie banners:

- Standardization: Establish a standard structure for all cookie banners.
- Have "Reject all" or "Only necessary" as default: Make it easier to reject all cookies and proposed making this option more prominent. Ideally, pressing "Enter" should reject all cookies or accept only those necessary.
- Simplified interface: Offer a straightforward choice between accepting or rejecting all cookies, with an option to delve into more specific settings if needed.
- Browser preset preferences across sites: Allow for cookie settings to be saved in the browser so the same preferences apply across all websites.
- Clear, Concise Text: Use simple and understandable text that quickly explains the implications of each choice, complemented by large buttons with sufficient contrast. It was suggested that language be simplified, and explanations be provided for each cookie setting.
- Better placement: Position the cookie banner in a way that does not obscure too much of the screen, especially on mobile devices.

V. DISCUSSION

We present results from the user tests and the survey separately, followed by a section with recommendations based on our discussion.

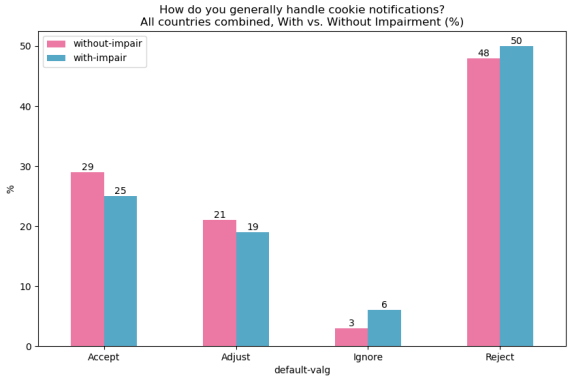

Figure 1. Cookie choice preferences (people with vs. without disabilities).

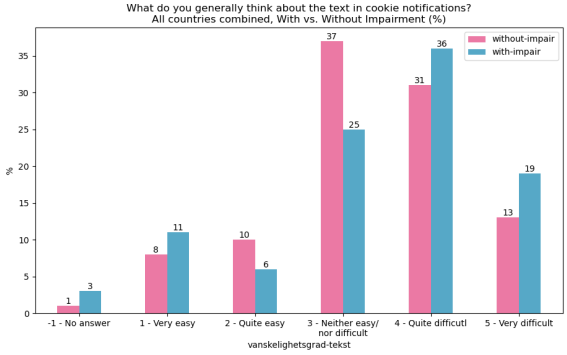

Figure 3. Perceived readability (people with vs. without disabilities).

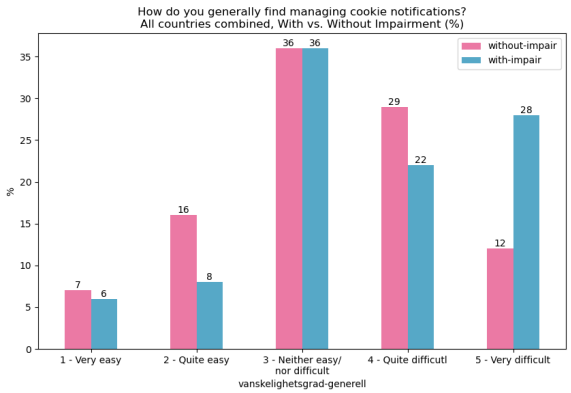

Figure 2. Perceived general difficulty (people with vs. without disabilities).

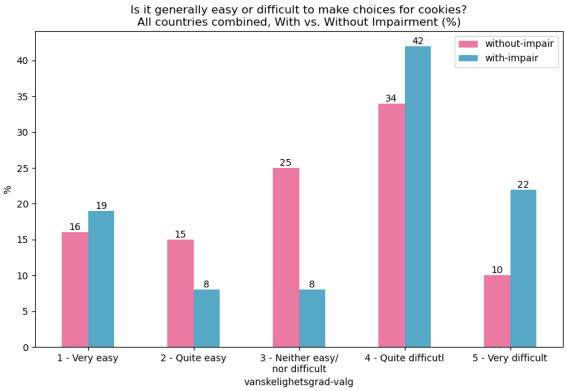

Figure 4. Perceived difficulty in decision-making (people with vs. without disabilities)

A. User Test-Related Results

The participant count (12) was limited by budget, making the sample non-representative, though we aimed for diversity in gender, age, abilities, and conditions.

An interesting finding was that there are common needs and desires across multiple functional groups. Users expected the banner to be located in the same place “as always/usual” to quickly move forward and avoid having to search around. For screen reader users and users with limited range and manipulation ability, navigating to and within cookie banners by means of tabbing was difficult. For people with low technical skills, limited cognition, language skills, or learning abilities, searching was stressful and consumed patience and energy.

Another interesting result was that some screen readers simply ignored blocking cookie banners and let the user proceed to the page, withholding them their choices and ignoring current legal regulations. In these cases, screen reader users are disadvantaged in comparison to others.

Ensuring that text is not excessively long or complicated was important for all participants. Screen reader users struggled to locate the banner’s starting point due to difficulties in getting an overview of the text. For people with limited cognition, language, or learning, reading through long texts was challenging as well. All groups had problems understanding non-standard terms (jargon).

Visual indicators for buttons (primary or secondary) appear not to work well for most users. Such indicators are not detected by screen readers and likely not sufficiently understood by people with limited cognition, or learning abilities, or with low technical interest.

B. Survey-Related Results

Most users tend to reject cookies by default, likely due to the complexity of the topic and limited understanding of how cookies work. Simple design and concise and comprehensive explanations are therefore essential. Few users customize settings, possibly because the process is too intricate, complex, or time-consuming.

Users with disabilities generally find cookie banners harder to manage, likely due to poor accessibility, excessive text, or confusing navigation. In both groups, more users found cookie management challenging than easy, especially among those with disabilities.

Text readability is a common issue, particularly for users with disabilities—over half reported difficulty reading / understanding the content. Even among users without disabilities, many found the text more challenging than easy, suggesting that descriptions and explanations are lengthy and not composed in a clear, simple manner.

Regarding limitations of our approach, our sample was not controlled, as participants were recruited through interest organizations and online forums. Despite this, our work offers valuable insights into how people with disabilities experience cookie banners. We also believe that the blend of quantitative and qualitative data offers a more profound understanding of the issues and potential solutions.

C. Recommendations

The recommendations are based on the findings in the user tests and the textual feedback from the survey.

Both the English term "cookie" and the Norwegian equivalent "informasjonskapsler" can be used. However, this must be done in a consistent manner. (This recommendation should be tested for other countries.)

There should be a standardized layout for the cookie banner, consistent across websites in terms of option range, text, and presentation. This layout should include easily accessible options which minimally contain three options: “Reject optional,” “Accept all,” and “Customize / Settings / Choose yourself.” A brief explanation should be provided for what “optional” entails.

The choices should be easy to understand and presented in a neutral manner:

- “Reject” should have the same prominence as “Accept.” Both buttons should be located side by side. “Reject” should be placed first.
- Items that cannot be opted out from should not resemble those that can be changed, regardless of whether they are disabled or not.
- There should be standardized explanations and a presentation form so that the user can easily understand and navigate. This could be standardized across multiple website owners or by international organizations like W3C or EU.
- Settings for individual cookie selection should be available for those who might want to use them.

There should be consistent confirmation messages after performed actions, and the user should be informed about how to make changes:

- After pressing “Reject” or “Accept,” a confirmation should replace the banner content, preferably with a “Close” button. This confirmation could also include where the link to the cookie settings is located if one wishes to change their mind later.
- After pressing “Customize,” the banner content could be replaced with the “Customize”-banner, displaying checkboxes above and below the “Save” buttons. If there are many boxes, consider using tabs, accordion menus, etc., as well as “Check all” and “Remove all checkmarks” buttons.

The presentation of information and operational elements should be simple, clear, and concise:

- Overuse of text should be avoided. It could however be beneficial to link to a privacy policy where cookies are explained in further detail.
- Explanatory text should be concise and comprehensive. Jargon and uncommon words should be avoided or explained.
- Consistent language should be used both within a website. It should be explained what the options mean and what choosing them entails. In particular, the term “Necessary cookies / Legitimate interest” should be explained in terms of why they are necessary, and which cookies this applies to.
- Proper structuring of the content is recommended to avoid too many alternatives at once during decision-making. This refers particularly to design measures which support content hierarchies, such as accordions, content hiding, links to further information, and similar.

Common recommendations for good accessibility and usability should be followed, for example WCAG. For instance, appropriate contrast should be utilized in the banner. Ideally, large font should be used for better usability or font size should be adjustable. Buttons should be prominently displayed and clear on the website with high contrasts as well.

If the cookie banner is displayed as an overlay dialog, the HTML dialog element should preferably be used. If the HTML dialog is not used for the banner, the banner should be prominently displayed at the top of the page, or the website should have a shortcut to it at the top of the page.

A link to the settings should also be placed at the bottom (footer) of the page for easy later access.

In cases where the user has already made a choice and wishes to see the settings again, the banner should include an option that allows the user to retain their current settings and close the banner.

Consideration should be given to potential conflicts between the cookie banner and other pop-up dialogs on the site, such as shopping cart, newsletter subscriptions, user surveys, etc. A possible solution could be to ensure that these banners do not appear simultaneously to avoid user confusion and distraction.

We have summarized these recommendations in guidelines found in Appendix 1 and created example prototypes based on them in Appendix 2.

VI. Conclusion and Future Work

In this study, we developed recommendations and guidelines for more universally designed cookie banners on websites based on the results from user evaluations and a survey. The focus of our work was on the universal design of cookie banners with special attention to user perceptions, both with and without disabilities.

Generally, users experience challenges with cookie banners due to a lack of digital accessibility, lack of clarity, information overload, and manipulative design. The participants in this study suggested several improvements. These include standardization of language use in cookie

banners for more transparent choices, simple and prominently placed interfaces, cross-site cookie preferences in the browser, and brevity and clarity of text.

The user tests and survey further underscored that cookie banners are generally perceived as a barrier to achieving a goal on a website. We identified several cognitive and sensory challenges, such as excessive text, use of jargon, complex navigation, and issues with color choices and overall accessibility. This poses challenges for users with disabilities, who reported a range of problems, including incompatibility with assistive tools like screen readers.

The project significantly contributes to previous research by specifically focusing on the needs of people with disabilities in the universal design cookie banners. Universal design deficiencies may prevent these users from accessing a website, obtaining needed information, or choosing their preferred option to provide informed consent, which in turn constitutes a violation of their right for privacy.

REFERENCES

[1] R. Koch, "Cookies, the GDPR, and the ePrivacy Directive," GDPR.eu. Accessed: Aug. 27, 2025. [Online]. Available: https://gdpr.eu/cookies/

[2] European Parliament (EP) and Council of the European Union, *Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector*, vol. 201. 2002. Accessed: Oct. 10, 2024. [Online]. Available: http://data.europa.eu/eli/dir/2002/58/oj/eng

[3] European Parliament and Council of the European Union, "General Data Protection Regulation (GDPR)." Accessed: Aug. 27, 2025. [Online]. Available: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0679

[4] Directorate-General for Communications Networks, Content and Technology (European Commission) *et al.*, *Inclusive web-accessibility for persons with cognitive disabilities: pilot project study : final report*. Publications Office of the European Union, 2022. Accessed: Oct. 10, 2024. [Online]. Available: https://data.europa.eu/doi/10.2759/3048

[5] H. Wahidin, J. Waycott, and S. Baker, "The challenges in adopting assistive technologies in the workplace for people with visual impairments," in *Proceedings of the 30th Australian Conference on Computer-Human Interaction*, Melbourne Australia: ACM, Dec. 2018, pp. 432–442. doi: 10.1145/3292147.3292175.

[6] European Union (EU), "Web Accessibility Directive (WAD) - Directive (EU) 2016/2102." Accessed: Aug. 27, 2025. [Online]. Available: https://eur-lex.europa.eu/eli/dir/2016/2102/oj

[7] Kommunal- og moderniseringsdepartementet, "Forskrift om universell utforming av informasjons- og kommunikasjonsteknologiske (IKT)-løsninger (FOR-2013-06-21-732)." EN: "Regulation on universal design of information and communication technology (ICT) solutions." Accessed: Aug. 27, 2025. [Online]. Available: https://lovdata.no/dokument/SF/forskrift/2013-06-21-732

[8] European Telecommunications Standards Institute (ETSI), "EN 301 549 v3.2.1 (2021-03): Accessibility requirements for ICT products and services." Mar. 2021.

[9] J. M. Clarke, M. Mehrnezhad, and E. Toreini, "Invisible, Unreadable, and Inaudible Cookie Notices: An Evaluation of Cookie Notices for Users with Visual Impairments," *ACM Trans. Access. Comput.*, vol. 17, no. 1, p. 1:1-1:39, Mar. 2024, doi: 10.1145/3641281.

[10] J. T. Simon-Liedtke, T. Halbach, S. Kjellstrand, and S. Laurin, "Exploring the Technical and Cognitive Accessibility of Browser Cookie Consent Banners for People with Varying Abilities," presented at the 27th International Conference on Human-Computer Interaction (HCII2025), Gothenburg, Sweden: Springer, 2025.

[11] Schibsted Marketplaces, "FINN.no – mulighetenes marked," EN: "FINN.no – The Markeplace of Possibilities," FINN.no. Accessed: Aug. 27, 2025. [Online]. Available: https://www.finn.no

[12] Barne-, ungdoms- og familiedirektoratet (Bufdir), "Bufdir.no | Bufdir," EN: "Ministry of Children and Families, " Bufdir.no. Accessed: Aug. 27, 2025. [Online]. Available: https://www.bufdir.no/

[13] Skatteetaten, "Skatteetaten - Person," EN: "Norwegian Tax Administration," Skatteetaten. Accessed: Aug. 27, 2025. [Online]. Available: https://www.skatteetaten.no/person/

[14] Meta, "Facebook - logg deg inn eller registrer deg," Facebook. Accessed: Aug. 27, 2025. [Online]. Available: https://nb-no.facebook.com/

[15] A. Bruun, P. Gull, L. Hofmeister, and J. Stage, "Let your users do the testing: A comparison of three remote asynchronous usability testing methods," in *Proceedings of the SIGCHI conference on human factors in computing systems*, in CHI '09. New York, NY, USA: Association for Computing Machinery, 2009, pp. 1619–1628. doi: 10.1145/1518701.1518948.

[16] T. Boren, "Thinking aloud: Reconciling theory and practice," *Prof. Commun. IEEE Trans. On*, vol. 43, pp. 261–278, Oct. 2000, doi: 10.1109/47.867942.

[17] World Wide Web Consortium (W3C), "Web Content Accessibility Guidelines (WCAG) 2.1." Accessed: Aug. 27, 2025. [Online]. Available: https://www.w3.org/TR/WCAG21/

[18] J. T. Simon-Liedtke, T. Halbach, S. Kjellstrand, and S. Laurin, "Tilgjengelige informasjonskapsler - Hvordan opplever mennesker med funksjonsnedsettelser samtykkefunksjoner på internettet?," EN: "Accessible Cookies - How Do People with Disabilities Experience Consent Features on the Internet?," Norsk Regnesentral (Norwegian Computing Center), Oslo, Norway, 2025.

[19] J. T. Simon-Liedtke, *NorskRegnesentral/tilgjengelige-informasjonskapsler*. (Jan. 27, 2025). Python. Norsk Regnesentral (Norwegian Computing Center). Accessed: Aug. 27, 2025. [Github]. Available: https://github.com/NorskRegnesentral/tilgjengelige-informasjonskapsler

APPENDIX 1: CHECKLIST FOR UNIVERSALLY DESIGNED COOKIE BANNERS

This checklist helps website owners make cookie banners accessible to all users, including those with disabilities. It offers practical tips on design, clarity, navigation, and technical accessibility to support informed choices across

devices and assistive tools—while also meeting legal standards and improving user experience.

A. Design and visibility

Ensure that the cookie banner is immediately visible upon the first visit to the website. It should be easy to find and not be hidden or difficult to access.

- Ensure that the cookie banner is at the beginning of the reading order.
- Keep the banner simple and focused, without too much text.
- Use a clear and large design that stands out so that users can quickly understand the purpose and what is expected.
- If the cookie banner is placed on a smaller screen, ensure that it takes up enough space to make it easy to interact with.

B. User-friendly options

Provide three clear and simple options for users:

- "Reject optional cookies": An option that allows users to choose to only accept necessary cookies and reject optional ones. A brief explanation should be provided for what "optional" entails.
- "Accept all cookies": A choice that makes it easy to quickly accept all cookies.
- "Customize yourself": An option that gives the user full control over cookie settings and lets them choose exactly which cookies they want to accept.

Ensure that each option is clear and easy to understand so that users can quickly make an informed decision.

C. Clarity and transparency

Be clear about what the different cookie options mean for the user and what they can expect from the website's functionality depending on what they choose.

If the cookie contains longer texts with more detailed information about how you or your partners use data, you can put this in collapsible paragraphs or as links, so that the user can choose how much information they want to see.

D. Understandability

Use easy-to-understand terms instead of technical terms to make it easy for all users to make an informed decision.

Where possible, insert links to explanations of words and terms used.

E. Easy navigation

Give users the ability to quickly and easily reject or accept all cookies with a single click, without having to go through multiple steps.

Ensure there is a clear and easily accessible link for users who want to change their choices or get more information about cookies and their purpose.

F. Technical accessibility

Ensure that the cookie banner works well on both desktop and mobile devices.

Ensure that the cookie banner is accessible to users with different types of assistive tools.

Check that the cookie banner complies with relevant accessibility standards [8, p. 301], [17].

G. User-friendly settings

Provide a simple and intuitive method that allows users to change cookie settings at any time after they have made an initial choice.

Ensure users do not need to search long to find out where they can change their settings. Provide a clear link or button to return to cookie choices.

APPENDIX 2: CHECKLIST FOR UNIVERSALLY DESIGNE COOKIE BANNERS

The prototype (cf. Figure 5) is based on the recommendations in this article. Some of the key recommendations illustrated in the prototype are:

- Cookie banners should not cover the screen.
- The banner should be placed centrally on the screen so that it is easy to find.
- There should be a clear sender.
- There are explanations for unusual terms used.
- There is a heading.
- The banner does not contain too much information.
- Extra information can be obtained by unfolding elements.
- The banner contains three choices that clearly distinguish from each other.

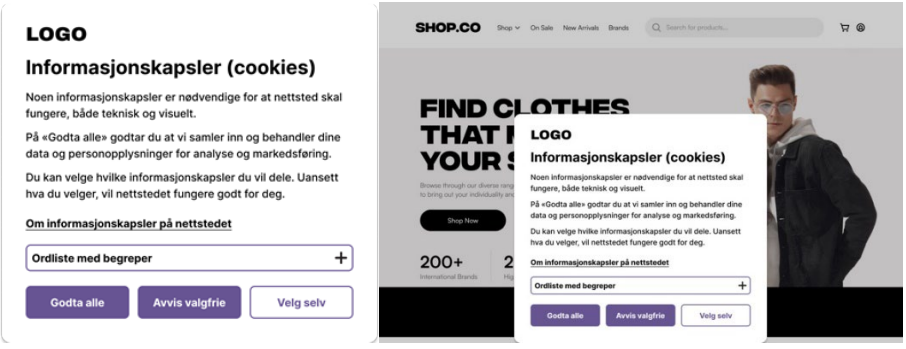

Figure 5. Prototypes of accessible cookie banners based on recommendations described in this article