How Can User Reviews Support Learning from Experience? An Interactive Tool to Guide Accessibility in Mobile Applications

Alberto Dumont Alves Oliveira[1]**, Ariel Emanuel Sebastian Campos**[2]**,
Luciana Aparecida Martinez Zaina**[2]**, Marcelo Medeiros Eler**[1]

[1] School of Arts, Sciences and Humanities – University of São Paulo (USP)
Rua Arlindo Béttio, 1000 – 03828-000 – São Paulo – SP – Brazil

[2]Department of Computer Science – Federal University of São Carlos (UFSCar)
Rodovia João Leme dos Santos, km 110 – 18052-780 – Sorocaba – SP – Brazil

`albertodumont@alumni.usp.br, arielcampos@estudante.ufscar.br`

`lzaina@ufscar.br, marceloeler@usp.br`

*Abstract. **Introduction**: Mobile applications are integral to daily life, yet designing accessible apps for users with disabilities remains challenging. While standards such as the Web Content Accessibility Guidelines (WCAG) exist, their complexity often limits adoption in fast-paced development. **Objective:** This paper presents A11YRevGuide (Accessibility User Reviews Guide), an interactive tool that links mobile accessibility guidelines with real user experiences from app store reviews. **Methodology**: Using the BBC Mobile Accessibility Guidelines, it organizes feedback into topics, enabling exploration of reported barriers and effective practices. **Results:** Visualizations such as tree diagrams, cards, and tables, combined with manual review analysis, connect formal guidance with lived experience. The tool supports inclusive app design, complements technical documentation with user evidence, and aligns with GranDIHC-BR 2025–2035 (Grand Challenge GC1).*
***Keywords** Mobile Accessibility, User Reviews Analysis, Accessibility Guidelines, Inclusive App Design, Information Visualization*

1. Introduction

Mobile applications have become essential in everyday life, supporting activities such as communication, education, transportation, banking, and digital public services [Oliveira et al. 2020]. Despite their widespread use, ensuring accessibility for people with disabilities remains a persistent challenge in mobile software development [Silveira et al. 2024]. Factors such as limited integration of accessibility into design workflows, insufficient training among professionals, and a lack of organizational prioritization contribute to the continued exclusion of users with diverse access needs [Eler et al. 2018, Yan e Ramachandran 2019, Alshayban et al. 2020, Chen et al. 2022].

To address these challenges, several accessibility standards have been introduced, including the Web Content Accessibility Guidelines (WCAG), the BBC Mobile Accessibility Guidelines, and national initiatives such as Brazil's ABNT NBR 17060 [W3C 2025a, BBC 2025, ABNT - ASSOCIAÇÃO BRASILEIRA DE NORMAS TÉCNICAS 2022]. These

standards define success criteria and design techniques intended to ensure usability for individuals with a wide range of disabilities. However, despite their importance, these guidelines are often difficult to interpret and apply in practical development scenarios, particularly in agile and mobile-first environments [Silveira et al. 2024].

In mobile app development, updates are frequently guided by user feedback, including reviews posted on platforms such as the Google Play Store. These reviews provide valuable information regarding bugs, performance, usability, and accessibility. Development teams increasingly rely on user reviews to prioritize product improvements and enhance user experience [Iacob e Harrison 2013, Pagano e Maalej 2013, Iacob et al. 2014, Palomba et al. 2015, Panichella et al. 2015, McIlroy et al. 2016, Nayebi et al. 2016, Ciurumelea et al. 2017, Di Sorbo et al. 2017, Li et al. 2018, Palomba et al. 2018, Pelloni et al. 2018, Liu et al. 2023].

In response to this landscape, this study presents A11YRevGuide (Accessibility User Reviews Guide)[1], an interactive tool that promotes digital accessibility by aligning user reviews with the BBC Mobile Accessibility Guidelines. The guide draws on the combined outcomes of a doctoral dissertation focused on digital accessibility and a master's thesis centered on information visualization. The resulting system enables the structured exploration of accessibility challenges and good practices as reported by real users.

This work also aligns with the Grand Challenge GC1 (New Theoretical and Methodological Approaches in HCI), which calls for revisiting the theoretical and methodological foundations of HCI to better address the complexity of contemporary interaction phenomena [da Silva Junior et al. 2024]. The proposed guide brings together the demand for accessible mobile apps and the need for novel pedagogical approaches by integrating lived user experiences into structured learning and design processes.

Unlike traditional tools that focus primarily on compliance or technical validation, this approach transforms user-generated content into structured and interactive educational material. Real-world feedback is linked to formal accessibility standards, enabling analysis and reflection on how accessibility is experienced in practice. Through multiple layers of visualization, the guide fosters intuitive exploration, critical engagement, and user-centered learning, addressing gaps in how accessibility is commonly taught and applied.

Through the integration of practical application and theoretical results, the guide also contributes to raising awareness and empathy among developers. Previous studies have demonstrated that engaging with users and domain experts enhances accessibility outcomes and increases designers' sensitivity to the lived experience of disability [Inal 2024, Inal e Cagiltay 2024]. The A11YRevGuide supports this process by foregrounding the voices of users who encounter barriers and by highlighting accessibility solutions that work in real contexts.

This research contributes to the Human-Computer Interaction field through the following key aspects:

- *User-Centered Evidence from Naturalistic Feedback:* Demonstrates the analytical

---

[1] https://ariellcampos.github.io/A11YRevGuide. Accessed: June 18, 2025.

value of spontaneous user reviews as a complementary data source, revealing accessibility issues often overlooked by traditional evaluation methods.

- *Bridging Normative and Experiential Knowledge:* Aligns formal accessibility standards with lived user experiences, fostering understanding beyond technical compliance.
- *Supporting Digital Inclusion:* Highlights accessibility concerns of visually impaired users, amplifying marginalized voices in the app development process.
- *Interdisciplinary Educational Contribution:* Introduces methodological innovation that spans HCI, accessibility research, and computing education.
- *Digital Accessibility for Educators:* Provides a pedagogical resource that connects abstract guidelines to user-centered insights, supporting situated learning and reflection.
- *Digital Accessibility for Developers and Professionals:* Offers a practical tool for understanding how accessibility barriers are perceived in real-world usage, informing inclusive design decisions.
- *Directions for Future Research:* Opens opportunities for expansion to other platforms (e.g., Apple App Store), broader disability categories, and integration with other standards such as WCAG and ABNT NBR 17060.

The remainder of this paper is structured as follows. Section 2 presents the background and discusses related work. Section 3 describes the methodology applied in developing the guide. Section 4 introduces the tool's technical foundations. Section 5 examines how A11YRevGuide addresses digital accessibility using user feedback. Section 6 discusses its educational and professional applications. Section 7 considers discussion and reflections. Section 8 addresses limitations and future directions, and Section 9 offers concluding remarks.

2. Background and Related Work

This section presents fundamental concepts including accessibility standards, the Web Content Accessibility Guidelines (WCAG), the BBC Mobile Accessibility Guidelines, user reviews, and information visualization, along with an examination of related work. Table 1 lists the main concepts and provides a brief description of each. The identified concepts, along with additional relevant notions, are found in related works published between 2012 and 2025 and are also embedded in the design and objectives of the proposed interactive guide.

[Oliveira e Silva 2012] developed eScanner, a Google Chrome extension for automatically validating web page accessibility according to the Brazilian e-MAG guidelines. The tool analyzes HTML code and provides feedback aligned with national standards, while also offering contextual information about the e-MAG model and related resources. Although the initiative was promising at the time, the e-MAG guidelines have not been updated since 2014 [Portal do Governo Brasileiro 2014], and the extension is no longer publicly available.

[Valerio 2019] proposed the Accessibility Toolkit, an educational resource aimed at facilitating the understanding of the Web Content Accessibility Guidelines (WCAG). The toolkit presents each of the 78 success criteria in the form of manipulable cards, allowing individual or group use to support discussion, clarification, and consolidation of

Tabela 1. Main Concepts and Descriptions Involved in the Research.

Concept	Description
Accessibility Standards	Formal documents that define standards, principles, and practices aimed at making digital interfaces usable and inclusive for all users, including people with disabilities [Park et al. 2014]. To ensure that mobile applications incorporate accessibility features, developers must go beyond platform-specific guidelines [Apple 2025, Android 2025, Google 2025] and follow established digital accessibility standards. These standards were originally designed for the web environment by the World Wide Web Consortium (W3C) [W3C 2025b].
Web Content Accessibility Guidelines (WCAG)	The WCAG aims to make digital content more accessible [W3C 2025a]. Although WCAG covers a wide range of accessibility needs, it does not fully address all types, degrees, or combinations of disabilities [Power et al. 2012]. The WCAG standard is globally adopted and extensively studied in scientific research[Serra et al. 2015, Reyes Arias et al. 2022, Othman et al. 2023, Filipe et al. 2023].
BBC Mobile Accessibility Guidelines	Developed by the British Broadcasting Corporation (BBC) and it targets not only BBC employees and suppliers but also anyone involved in mobile app development [BBC 2025]. Based on WCAG guidelines and content requirements tailored for UK audiences [BBC 2025]. The BBC standard was selected for the proposed tool due to: (i) its alignment with WCAG principles, (ii) specific focus on mobile devices and user experience, and (iii) its global adoption by both professionals and researchers [Aljedaani et al. 2023, Dos Santos et al. 2024].
User Reviews	Consist of texts that describe the advantages and disadvantages of a product or service, often accompanied by a rating and recommendations [Hedegaard e Simonsen 2013]. In the mobile ecosystem, users can post comments and assign stars directly in app stores immediately after downloading [Al-Subaihin et al. 2019, Guzman et al. 2014]. These reports, usually limited to 675 characters [Pagano e Maalej 2013], are produced by both ordinary consumers and professional reviewers [Hedegaard e Simonsen 2013].
Information Visualization (InfoVis)	Applies interactive visual representations to amplify human cognition, enabling rapid insight and effective monitoring of data sets [Card et al. 1999]. InfoVis also facilitates analytical exploration for users of varying skill levels [Munzner 2014]. Within HCI, it is regarded as a complement—not a replacement—to human judgment: the goal is to enhance perception and interpretation while mitigating the cognitive load of data preparation [Ware 2019].

learning. By simplifying complex technical content into a tangible and interactive format, the toolkit addresses one of the main challenges in accessibility education and promotes broader engagement with accessibility standards.

[Oliveira e Monteiro 2023] created DAI, an accessibility documentation plugin for the Figma prototyping platform. The tool allows designers to annotate accessibility requirements directly within interface prototypes, facilitating communication with developers based on WCAG criteria. The plugin was evaluated through usability tests with non-expert users, highlighting its potential to improve team collaboration and documentation practices in accessible design workflows.

[Campos 2023, Campos e Zaina 2024] proposed UX-RIVIS (User eXperience Reviews Information Visualization), a visualization tool designed to support the analysis of user reviews with a focus on user experience (UX) aspects in mobile app development. The tool was based on 16 design guidelines derived from a systematic literature mapping and informed by Shneiderman's Visual Information-Seeking Mantra. Evaluated by software professionals, the application was shown to enhance the understanding and communicability of UX data, with a preference for tables and pie charts among participants.

[Oliveira et al. 2024, Oliveira 2024] conducted a mixed-methods study to analyze accessibility-related user reviews from the Google Play Store, focusing on individuals with visual impairments and ocular conditions. The study included a large-scale quantitative exploration, followed by manual content analysis mapping user complaints to WCAG 2.2 and BBC accessibility guidelines. Findings revealed recurring issues such as poor contrast, font size, and the absence of dark mode, highlighting serious usability barriers. The research emphasizes user reviews as a rich source of accessibility insights with practical implications for inclusive mobile app development.

[Nunes 2025] developed Ramplifica, a web-based system designed to support the application of Brazil's ABNT NBR 17060 accessibility standard in mobile software development. The platform provides tailored content for different professional profiles, including developers, designers, and testers. The content was generated using AI-assisted methods, reviewed by experts, and organized into an interface tested for usability. The tool simplifies access to the 37 mandatory requirements, enhancing practical adoption of accessibility norms.

In contrast to related works, which often emphasize documentation, automatic validation, or simplified representations of guidelines, this study focuses on bridging formal accessibility standards with real user experiences through the analysis of app store reviews. While tools like the Accessibility Toolkit and Ramplifica address educational and normative aspects, and others such as DAI and UX-RIVIS focus on design and visualization, the software introduced in this research transforms spontaneous user feedback into an interactive and pedagogically grounded interface. By mapping qualitative data to accessibility topics and providing flexible visual representations, A11YRevGuide supports critical learning, fosters inclusive development practices, and encourages broader user-centered engagement with accessibility.

3. Methodological Procedures

This section details the methodological procedures that led to the development of A11YRevGuide. Additionally, we highlight the ethical considerations involved in this research.

Figure 1 presents the overall methodological approach adopted in developing A11YRevGuide. The process begins with the collection of 1,928 user reviews containing accessibility-related feedback from previous work. These reviews undergo a content analysis approach, in which two researchers manually code the data and align it with specific accessibility guidelines from the BBC Mobile Accessibility Guidelines. The resulting categorized data is then transformed using information visualization techniques, creating interactive visual representations. These visualizations are integrated into the tool to support two main outcomes: empowering HCI education and enhancing mobile app development.
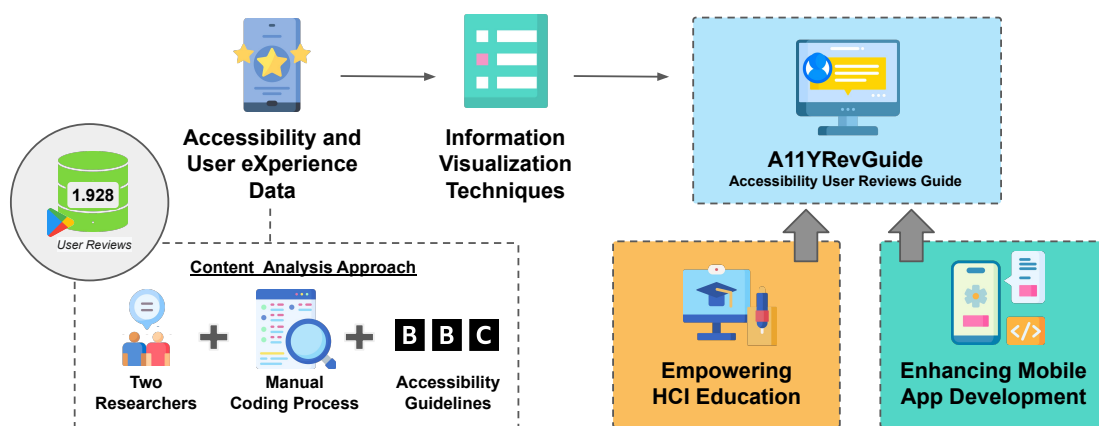
Figura 1. Overview of A11YRevGuide development and usage perspectives.

The three main components of this study include the data used in the software, the technological resources employed, and the objectives of A11YRevGuide along with its target audience:

- *Accessibility and User Experience Data:* The tool's dataset originated from a doctoral study by one of the authors [Oliveira 2024], which focused on characterizing user reviews in Google Play Store applications related to visual impairments. Dataset construction began in 2022 with an initial corpus of 4,999 user reviews from individuals with visual disabilities or ocular conditions [Oliveira et al. 2023]. This research produced two subcorpora: Subcorpus A, developed in 2023, containing app update reviews analyzed against WCAG standards [Oliveira et al. 2024]; and Subcorpus B, created in 2024 and used in A11YRevGuide, consisting of reviews qualitatively analyzed using BBC accessibility guidelines [Dos Santos et al. 2025].
- *Information Visualization Techniques:* The proposed software structure was adapted from UX-RIVIS, a tool previously developed for user experience analysis during one author's master's research [Campos 2023, Campos e Zaina 2024]. The visualization methods and technical implementation are detailed in Section 4.

- *A11YRevGuide:* The integration of accessibility and user experience data with information visualization techniques resulted in the proposed platform. Tool functionalities are described in Section 5, while educational and professional applications are presented in Section 6.

3.1. Ethical Considerations

This study follows ethical principles in collecting and analyzing user-generated content. While the analyzed user reviews are publicly available on the Google Play Store [Google LLC 2025], all personally identifiable information including names, photos, or contact details was removed to ensure user privacy. The reviews were used exclusively for academic research, with selection based on relevance to accessibility issues rather than individual characteristics.

The A11YRevGuide does not intend to represent users with disabilities, but rather seeks to illuminate how their experiences are expressed in public forums. We acknowledge the potential for perpetuating stereotypes or misrepresenting complex experiences, and have carefully presented findings with appropriate consideration. Designed as an educational resource for developers and educators, the guide serves as a supplementary aid rather than a comprehensive accessibility compliance assessment. Its application should involve thoughtful analysis and, where feasible, direct partnership with individuals with disabilities.

4. A11YRevGuide: Design and Development Process

The visualizations implemented in A11YRevGuide were inspired by the approach of [Campos e Zaina 2024]. In that work, the authors presented UX-RIVIS (User eXperience Reviews Information Visualization), a set of data visualizations created on the basis of Visual Information-Seeking Mantra [Shneiderman 1996] and design guidelines they identified. These visualizations support the exploration and analysis of UX data extracted from app reviews. Consequently, UX-RIVIS served as a conceptual basis for both the visual design and the architectural framework of the present guide.

A11YRevGuide was built with the Angular framework[2], following single-page-application principles and a reusable-component architecture. The project uses NGXS[3] for state management and Angular Material[4] for table, select, input, and button components. Remaining components were implemented in HTML, CSS, and TypeScript. Version control and hosting are handled on GitHub. The final version of the A11YRevGuide is available for access at the link[5].

Visual Information-Seeking Mantra [Shneiderman 1996] — overview first, zoom and filter, then details on demand — defines the interaction tasks that a data-visualization system should enable. The overview first task gives a broad view of the data, allowing users to identify general patterns, trends, or areas of interest. Zoom and filter lets users focus on specific regions and apply criteria to isolate relevant subsets, removing irrelevant

---

[2]`https://angular.io/`. Accessed: June 18, 2025.

[3]`https://www.ngxs.io/`. Accessed: June 18, 2025.

[4]`https://material.angular.io/`. Accessed: June 18, 2025.

[5]`https://ariellcampos.github.io/A11YRevGuide`. Accessed: June 18, 2025.

items. Details on demand provides detailed information about selected elements without overloading the interface at the outset.

Upon accessing the guide, a modal dialog box appears, briefly describing its purpose and features. After closing the dialog box, the interface presents the initial tree diagram visualization, allowing step-by-step exploration of the data. When a comprehensive overview is needed, the user can switch to a card list or table view that displays all assessments associated with the selected topic and guideline. The following two subsections describe these views in detail.

4.1. Tree Diagram Visualization: Overview and Structure

Tree diagram visualization is used to represent data with a hierarchical structure. Items are organized into nodes, connected by lines that indicate relationships between high-level and low-level items, starting from a root node. In our tool, a tree diagram was used to represent the hierarchical structure of BBC Mobile Accessibility topics. The guidelines were organized under each topic, and the user reviews were grouped based on their relevance to each guideline. Figure 2 shows the visualization of the fully expanded tree diagram, with all hierarchical levels visible.

Figura 2. Tree diagram visualization of the A11YRevGuide, representing the hierarchical structure of the BBC Mobile Accessibility Guidelines

The tree diagram visualization was implemented based on the tasks defined in the Visual Information-Seeking Mantra [Shneiderman 1996]. After interacting with the root node, the "overview first" task is reflected in the initial level of the tree, where each topic is presented along with its associated guidelines, the total number of user reviews, and their classification as positive or negative.

The "zoom and filter" tasks are supported through interaction with buttons available on the nodes at the first level. By selecting a topic, the second level of the tree is revealed, showing the guidelines related to that selection. Each second-level node displays the name of the guideline, a brief description, a link to its official documentation, and again, the total number of related user reviews and their classification.

The "details on demand" task is addressed in the third and final level of the tree, where two to four user reviews nodes are shown for selected guideline. Each of these nodes is represented by a card containing: the name of the application, the date of the

review, the category of the app (as defined by the Play Store[6]), package name, the rating of the stars, the classification of the review (i.e., positive or negative), and the review text itself. Furthermore, each cards displays the topics and guidelines identified in the review, as well as the associated disability/condition and resource recommendations. Finally, a button at the end of this level allows users to access the remaining assessments related to the selected guideline, presented in an alternative visualization, card list, and tabular visualization.

4.2. Card-list and tabular visualization: Interactive Exploration

After selecting a topic and guideline in the tree diagram visualization, the tool opens a second visualization that supports interactive exploration of the corresponding reviews. In this interface, a control panel allows to (i) switch between a card-list visualization and a tabular visualization, (ii) change the current topic and guideline, (iii) return to the tree-diagram view, and (iv) download the underlying data set in XLSX format. The visualization is refreshed automatically whenever a filter is modified. Furthermore, the interface shows the chosen BBC topic and guideline with its description, review count, plus a documentation link. The reviews below as either a scrollable card grid or a paginated table.

The card-list layout adopts the same card design used in the tree-diagram view: each review is encapsulated in a rectangular card that contains its metadata (i.e., application name, review date, app category, package name, star rating, and the classification of the review) followed by the review text, the identified topics and guidelines, and any associated disability/condition and resource recommendations. The left image in Figure 3 illustrates this layout.
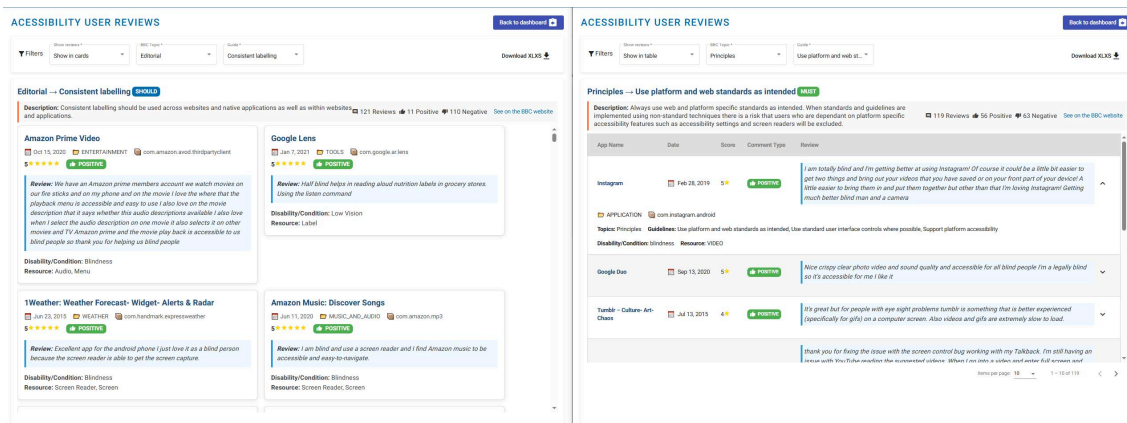
Figura 3. Card-list and tabular visualizations of the A11YRevGuide, showing user reviews related to a BBC topic and guideline.

The tabular layout follows the design presented by [Campos e Zaina 2024]. The table supports pagination, column sorting in ascending or descending order, and row expansion to show or hide the full content of each review. The right image in Figure 3 illustrates this layout.

---

[6]https://support.google.com/googleplay/android-developer/answer/9859673. Accessed: June 18, 2025.

5. Exploring the Accessibility Through the Guide

Digital accessibility is addressed in the guide through a layered process that connects user feedback from app store reviews to formal accessibility standards. By aligning user-generated content with specific topics and guidelines from the BBC Mobile Accessibility Guidelines, A11YRevGuide provides a structured and visual way to explore how users perceive and report accessibility barriers and enablers. Each review is annotated with relevant accessibility topics, mapped to specific BBC guidelines, and classified according to sentiment and possible disability context.

A11YRevGuide is organized by distributing the accessibility guidelines and their respective user reviews across the 12 topics of the BBC standard, named: Audio and video, Design, Editorial, Focus, Forms, Images, Links, Notifications, Principles, Scripts and dynamic content, Structure, and Text equivalents. This section explores two accessibility examples using the interactive guide. Example 1 features the "Colour Contrast" guideline, which belongs to the "Design" topic, while Example 2 presents the "Inclusive Notifications" guideline, part of the "Notifications" topic.

5.1. Example 1: Browsing the Design Topic

The interface allows users to navigate from broader topics, such as Design, to a specific guideline (e.g., Colour Contrast). Once selected, the user can explore a dataset of annotated user reviews that provide real examples of how that guideline affects usability. This structured linkage enables both an empirical understanding of accessibility and a pedagogical framework for analysis and teaching. Figure 4 illustrates how the guide presents the relationship between accessibility guidelines and user feedback, using the Design topic and the Colour Contrast guideline as a representative example.

This first example presents an interactive view of the guide, showcasing the number of user reviews associated with each BBC accessibility topic and guideline. The top layer displays broader topics such as Design, Editorial, and Audio and Video, along with metadata on how many reviews (positive or negative) are linked to each. The Design topic, which includes twelve guidelines, is particularly prominent, with over 2,700 reviews—of which 2,233 are classified as negative and 449 as positive.

Upon selecting the guideline Colour Contrast, the user accesses a breakdown of 854 reviews, revealing how users have identified issues or praised implementations related to text and background contrast. For example, one positive review from the Samsung Internet Browser app highlights that "the high CONTRAST mode is very useful for the low vision persons." This demonstrates appreciation for inclusive design that directly benefits users with low vision.

Conversely, a negative review from the FlipaClip app points to poor implementation of contrast and brightness features. The reviewer, who possibly experiences photophobia, mentions discomfort due to lack of a dark mode and bright UI elements, which "show I'm still awake and blind me." This feedback exemplifies how poor contrast settings can result in severe accessibility barriers.

Figure 4 highlights how the guide offers concrete evidence from real users that can be used to critically examine accessibility implementation. By classifying reviews and linking them to guidelines, A11YRevGuide enables a grounded and experience-based understanding of digital inclusion.
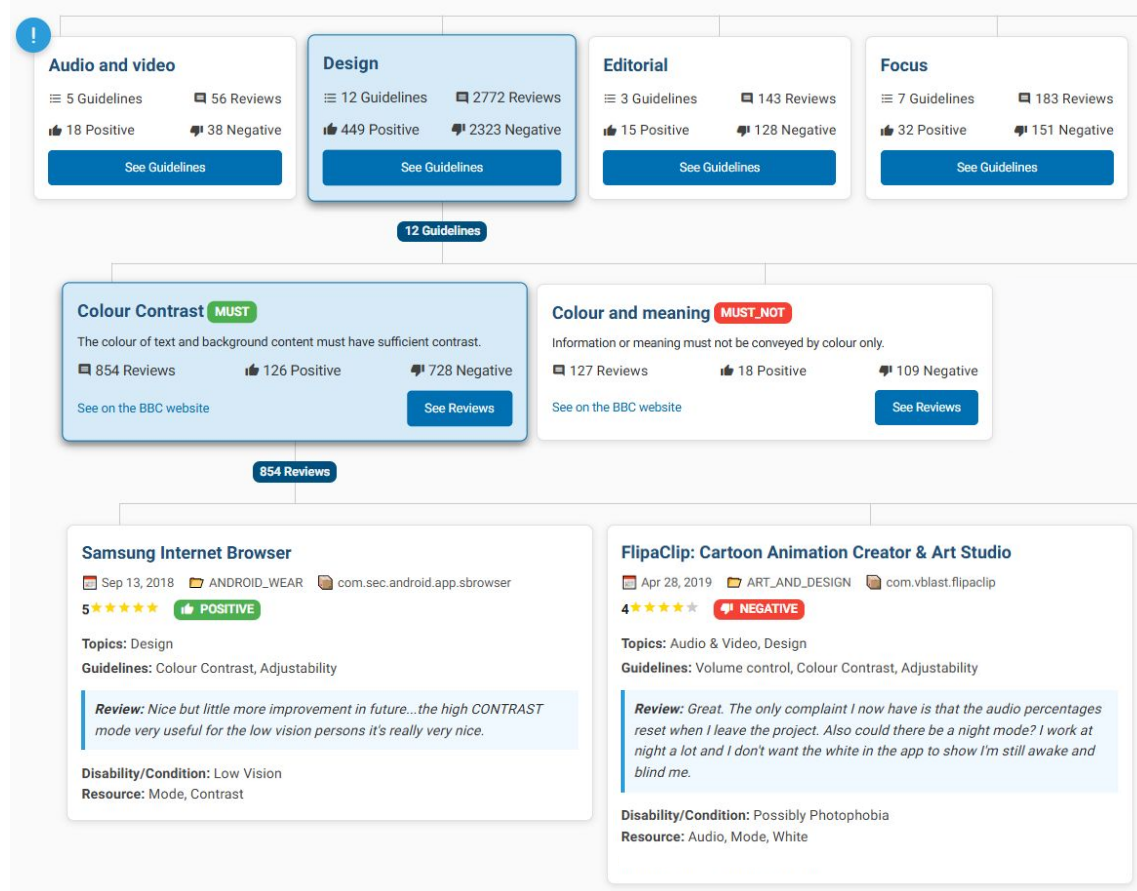
Figura 4. Interface of the guide illustrating how user reviews are linked to BBC accessibility guidelines, exemplified by the topic *Design* and the guideline *Colour Contrast*, with one positive and one negative review.

5.2. Example 2: Searching the Notifications Topic

Each topic within the guide, such as Notifications, is broken down into specific guidelines. When a guideline is selected (e.g., Inclusive Notifications) the interface displays user reviews filtered by relevance and associated accessibility concerns. These reviews are annotated with the reported disability or condition and the digital resource referenced, providing structured insight into how accessibility barriers and successes are perceived by users. Figure 5 illustrates how the guide presents annotated user reviews related to the guideline Inclusive Notifications, highlighting both a positive and a negative example.

This second example shows the filtered view of the guide focused on the Notifications topic, specifically the guideline Inclusive Notifications, which states that notifications must be both visible and audible. Two reviews are displayed, reflecting contrasting user experiences. The first review is a positive comment on Google Classroom, where a user with visual impairment commends the app for integrating well with Android and for offering a notification system that enhances accessibility. This reinforces the importance of inclusive design in core interaction features.

The second review, associated with TikTok, is negative and highlights a critical barrier: the lack of a dark mode impedes the user's ability to interact with notifications.

Figura 5. Interface of the guide displaying user reviews mapped to the guideline *Inclusive Notifications*, **under the topic** *Notifications*, **with one positive and one negative user experience.**

The reviewer, who self-identifies with partial blindness, notes difficulty in accessing content due to poor visual contrast, suggesting a failure to meet inclusive notification standards. Together, these examples illustrate how the guide surfaces experiential data that is often absent from formal audits. By organizing user-generated content within a standards-based standard, A11YRevGuide provides a meaningful foundation for reflection, education, and accessibility-oriented design practices.

6. Applying the Guide in Practice

This section presents how the guide can be meaningfully applied in both academic and professional contexts. We highlight its potential to support accessibility education and enhance inclusive practices in mobile app development. Additionally, we present two Hypothetical use cases illustrating potential application scenarios.

6.1. The Guide in Academia: Empowering HCI Education

The A11YRevGuide was designed as a support tool for pedagogical resource capable of enhancing how accessibility is taught and understood in academic environments. Table 2 outlines a pedagogical activity designed for Human-Computer Interaction courses with digital accessibility modules.

Tabela 2. Proposed Exercise for Tool Evaluation in academic context.

Practical Exercise on Accessibility for HCI Courses

A hands-on activity using the guide to teach accessibility principles.

1. Access the Tool:
Use [Tool Name Hidden for Blind Review] to explore user reviews mapped to BBC Mobile Accessibility Guidelines.

2. Select a Topic:
Choose one of the accessibility topics (e.g., Design) and subsequent guidelines (e.g., Colour Contrast, Consistency) .

3. Analyze User Reviews:
Review at least 5 user comments within the selected topic and guideline and answer the following:
a) What common accessibility barriers are reported?
b) Are there any recurring usability patterns or positive examples?
c) How do these findings align with the corresponding guideline?

4. Propose a Redesign:
Based on the issues identified, propose at least one interface or interaction improvement to address the barriers reported. Use a UI prototyping tool (e.g., Figma) to implement the corresponding accessibility guidelines.

5. Reflect Critically:
In a short paragraph, reflect on what this process reveals about the limitations of formal guidelines when compared to real user experiences.

The following items specifies the parameters of the practical exercise, including the associated learning objectives, expected student deliverables, measurable learning outcomes, and criteria for assessing the tool's effectiveness.

- *Objective:* This activity aims to help students critically examine accessibility issues in mobile apps by analyzing real user feedback and linking it to established accessibility guidelines using A11YRevGuide.
- *Deliverables:* Students will submit a brief report or presentation summarizing an accessibility topic, key user reviews, proposed interface improvements, and a short critical reflection.

- *Learning Outcome:* Students will apply accessibility principles to real contexts, enhance empathy in design decisions, and reflect on how user experiences relate to formal standards.
- *A11YRevGuide Evaluation:* At the end of the activity, participants may complete a short evaluation form to assess the tool's usability and its effectiveness in supporting accessibility education.

Through the mapping of end-users feedback to accessibility guidelines, A11YRevGuide enables students, instructors, and researchers to reflect on accessibility from a empathetic, critical, experiential, and user-centered perspective. Its potential applications span from classroom activities to advanced research training, providing a versatile and interdisciplinary resource for computing education:

- *Teaching Accessibility Through User Feedback:* Instructors can integrate A11YRevGuide into HCI, UX, or Accessibility courses to demonstrate how users experience accessibility in practice. This contextualizes abstract guidelines and enriches classroom discussions with authentic cases.
- *Assignments and Practical Exercises:* Students can be tasked with analyzing user reviews linked to specific guidelines, identifying barriers and proposing design solutions. This strengthens applied skills in inclusive design and critical thinking.
- *Capstone and Group Projects:* A11YRevGuide can support semester-long projects where student teams redesign parts of existing apps based on user-reported accessibility issues. It helps bridge theoretical content and real-world problem solving.
- *Research Training and Qualitative Analysis:* Graduate students can use A11YRevGuide to learn about thematic coding, data interpretation, and guideline mapping as part of research methodology courses.
- *Workshops and Continuing Education:* A11YRevGuide can be used in academic extension programs and professional development workshops to promote accessibility literacy and ethical digital design.

6.2. The Guide in Industry: Enhancing Mobile App Development

The A11YRevGuide has direct applicability in industry settings, especially for mobile development teams seeking to improve accessibility practices in user-centered ways. Table 3 presents a simulated industry training scenario for improving product accessibility, detailing exercise specifications, goals, expected outputs, and tool evaluation.

The following items specify the parameters of the practical exercise, including the associated learning objective and expected professional IT deliverables. They also outline the measurable learning outcomes and the criteria for assessing the tool's effectiveness.

- *Objective:* A practical activity using the guide to support developers, designers, and QA professionals in identifying real-world accessibility issues by analyzing user reviews and mapping them to formal accessibility guidelines using the guide.
- *Deliverables:* A short summary (written or verbal) describing the barrier identified, its impact on the user, and one concrete action point for your team.

Tabela 3. Proposed Exercise for Tool Evaluation in Industry Context.

Identifying Accessibility Gaps Through User Feedback
A pratical activity that uses the guide to enhance the application of accessibility principles in project development.
1. Select a BBC Accessibility Guideline relevant to your product (e.g., Alternatives for non-text content, Color Contrast, Choice). 2. Use the guide to explore user reviews associated with that guideline. 3. Choose at least 3 reviews that report issues or successes. 4. Answer these prompts (individually or in small groups): a) What specific barrier is being described? b) Is this barrier already addressed in your current product? c) What change would you suggest to mitigate the issue?

- *Learning Outcome:* Professionals will strengthen their ability to interpret accessibility feedback from real users and integrate it into inclusive product development.

- *A11YRevGuide Evaluation:* To evaluate the tool in professional settings, participants may be invited to complete a brief feedback form after using it in real or simulated design and development scenarios.

The structured alignment of end-users feedback with formal accessibility guidelines enables a range of professional applications:

- *Accessibility Audits Augmented by User Perspective:* Development teams can use A11YRevGuide to identify frequently reported accessibility issues from actual app users. This complements traditional audit checklists by adding a layer of user-reported evidence, helping prioritize real-world barriers.
- *Design Feedback Loops:* During early design stages or sprint retrospectives, teams can consult mapped user reviews to understand which accessibility guidelines are most often violated or praised by users. This supports proactive design adjustments before formal testing.
- *Training and Onboarding in Accessibility:* The guide can be integrated into onboarding materials or internal workshops to train developers and designers in inclusive practices. By presenting accessibility through the lens of user experience, it helps demystify abstract standards.
- *Benchmarking Competitor Apps:* Product teams can analyze how users comment on accessibility in similar or competing apps, using the guide to extract structured feedback that informs differentiation strategies or improvements.

- *Continuous Improvement in Agile Environments:* In agile workflows, A11YRevGuide can serve as a living reference that teams consult between releases to review real-world user input and monitor how accessibility evolves over time.

Building on these academic and industry use cases, it is also important to consider the broader conceptual positioning of the guide. Additionally, the methodological implications of its user-centered approach should be examined.

7. Discussion and Reflections

A11YRevGuide introduces a distinct approach to accessibility education and analysis by aligning formal guidelines with authentic user experiences. While existing resources such as the Accessibility Toolkit aim to simplify WCAG standard [Valerio 2019], and platforms like Ramplifica support the dissemination of accessibility requirements [Nunes 2025], this work differentiates itself by organizing user feedback into an interactive, exploratory environment. The approach moves beyond technical compliance, emphasizing how accessibility barriers are actually encountered in everyday mobile interactions.

Translating abstract guidelines into concrete examples reveals patterns that are often overlooked. For example, the analysis highlights how recurrent issues such as insufficient color contrast or the absence of dark mode functionality can significantly affect users with visual impairments. While this user-centered strategy enriches accessibility understanding, it also introduces limitations that require careful consideration.

Although app store reviews provide helpful knowledge, they do not fully represent the diversity of disability experiences. In particular, perspectives from users with cognitive or motor impairments appear less frequently than experiences from users with visual impairments. Furthermore, while the manual categorization process employed in this work supports methodological rigor, it also demands significant time and expertise. Future work could explore the integration of automated classification techniques to support scalability.

From an implementation perspective, promoting adoption of A11YRevGuide within professional development workflows may face challenges, especially in agile environments where accessibility is not consistently prioritized. This emphasizes the importance of organizational support and policy-level incentives to embed inclusive design practices across the development lifecycle.

The tool's primary strength lies in its dual applicability. In educational settings, it facilitates the teaching of accessibility through tangible, user-centered narratives. In professional contexts, it offers actionable insights drawn from real-world feedback, complementing existing evaluation standards and encouraging empathetic, evidence-based design. Looking forward, enhancing A11YRevGuide through participatory design practices and incorporating a broader range of user experiences may further strengthen its capacity to support inclusive digital environments. Such developments would reinforce its role as both a pedagogical asset and a catalyst for reflective accessibility practices in software development.

8. Limitations and Future Work

Developing a tool requires understanding both its potential and limitations, which can be addressed and improved in future work. We discuss these aspects across four dimensions: Coverage of Disabilities, Data Source Constraints, Diversity of Accessibility Standards and Guidelines, and Validation Scope.

- *Disability Coverage:* The current version primarily addresses accessibility issues related to visual impairments and eye conditions. This focus may overlook barriers experienced by users with motor, cognitive, or hearing disabilities. Future iterations will extend the analysis to encompass a broader range of user experiences involving diverse accessibility needs.
- *Data Source Scope:* At present, A11YRevGuide relies exclusively on user reviews from the Google Play Store. This single-platform approach may limit the diversity of feedback captured. Planned developments include expanding A11YRevGuide to incorporate reviews from other ecosystems, such as the Apple App Store, in order to provide a more comprehensive view of accessibility challenges and solutions across platforms.
- *Accessibility Standards and Guidelines:* The guide currently uses the BBC Mobile Accessibility Guidelines as its primary reference standard. While this provides a strong foundation, future versions will integrate additional standards such as WCAG and ABNT NBR 17060, increasing the tool's relevance across educational and regulatory contexts.
- *Validation and Empirical Testing:* Although A11YRevGuide successfully maps user feedback to formal guidelines, it has not yet undergone empirical validation with educators or developers. Future research will include user studies (Table 2 and Table 3) to evaluate the tool's effectiveness in teaching contexts and software development workflows.

These limitations underscore the evolving nature of accessibility research and tool design. While the current version provides a novel intersection of user feedback and formal standards, future work will focus on expanding its applicability, refining its validation, and incorporating more diverse perspectives to strengthen its educational and professional impact.

9. Concluding Remarks

This paper introduced A11YRevGuide, an interactive guide that connects user reviews with mobile accessibility standards to support both education and inclusive design practices. By linking experiential feedback with formal guidelines, the guide offers a user-centered perspective on digital accessibility that complements normative approaches.

A11YRevGuide contributes to Human-Computer Interaction by proposing a methodological integration of empirical data, information visualization, and accessibility research. It responds to the Grand Challenge GC1 by offering a pedagogical and analytical model grounded in real-world user experiences, fostering critical engagement and reflection among students and practitioners.

Future developments include empirical evaluation with target audiences, expansion to additional platforms and disabilities, and alignment with broader standards such as WCAG and ABNT NBR 17060. These efforts aim to increase the tool's relevance and support more inclusive and evidence-based accessibility practices.

Referências

ABNT - ASSOCIAÇÃO BRASILEIRA DE NORMAS TÉCNICAS (2022). NBR 17060:2022 - Acessibilidade em Aplicativos de Dispositivos Móveis - Requisitos. `https://bit.ly/479OI5B`. Accessed: August 25, 2025.

Al-Subaihin, A. A., Sarro, F., Black, S., Capra, L., e Harman, M. (2019). App store effects on software engineering practices. *IEEE Transactions on Software Engineering*, 47(2):300–319. DOI: `https://doi.org/10.1109/TSE.2019.2891715`.

Aljedaani, W., Alkahtani, M., Ludi, S., Mkaouer, M. W., Eler, M. M., Kessentini, M., e Ouni, A. (2023). The state of accessibility in blackboard: Survey and user reviews case study. In *Proceedings of the 20th International Web for All Conference*, W4A '23, page 84–95, New York, NY, USA. Association for Computing Machinery. DOI: `https://doi.org/10.1145/3587281.3587291`.

Alshayban, A., Ahmed, I., e Malek, S. (2020). Accessibility issues in android apps: state of affairs, sentiments, and ways forward. In *2020 IEEE/ACM 42nd International Conference on Software Engineering (ICSE)*, pages 1323–1334. IEEE. DOI: `https://doi.org/10.1145/3377811.3380392`.

Android (2025). Acessibilidade. `https://www.android.com/intl/pt-BR_br/accessibility/`. Accessed: January 01, 2025.

Apple (2025). Acessibilidade. `https://www.apple.com/accessibility/`. Accessed: May 11, 2025.

BBC (2025). The bbc standards and guidelines for mobile accessibility. `https://www.bbc.co.uk/guidelines/futuremedia/accessibility/mobile`. Accessed: January 01, 2025.

Campos, A. E. e Zaina, L. (2024). Ux-rivis: Visualization of information about ux data based on app reviews. In *Proceedings of the XXIII Brazilian Symposium on Human Factors in Computing Systems*, pages 1–13. DOI: `https://doi.org/10.1145/3702038.3702087`.

Campos, A. E. S. (2023). Ux-rivis: Visualização da informação sobre dados de ux baseado em revisões de aplicativos. Dissertação de mestrado em ciência da computação, Universidade Federal de São Carlos, São Carlos, SP. `https://sucupira-legado.capes.gov.br/sucupira/public/consultas/coleta/trabalhoConclusao/viewTrabalhoConclusao.jsf?popup=true&id_trabalho=14013073`. Accessed: June 18, 2025.

Card, S. K., Mackinlay, J., e Shneiderman, B. (1999). *Readings in information visualization: using vision to think*. Morgan Kaufmann. DOI: `https://dl.acm.org/doi/10.5555/300679`.

Chen, S., Chen, C., Fan, L., Fan, M., Zhan, X., e Liu, Y. (2022). Accessible or not? an empirical investigation of android app accessibility. *IEEE Transactions on Software Engineering*, 48(10):3954–3968. DOI: `https://doi.org/10.1109/TSE.2021.3108162`.

Ciurumelea, A., Schaufelbühl, A., Panichella, S., e Gall, H. C. (2017). Analyzing reviews and code of mobile apps for better release planning. In *2017 IEEE 24th International*

Conference on Software Analysis, Evolution and Reengineering (SANER), pages 91–102. DOI: `https://doi.org/10.1109/SANER.2017.7884612`.

da Silva Junior, D. P., Alves, D. D., Carneiro, N., Matos, E. d. S., Baranauskas, M. C. C., e Mendoza, Y. L. M. (2024). GranDIHC-BR 2025-2035 - GC1: New Theoretical and Methodological Approaches in HCI. In *Proceedings of the XXIII Brazilian Symposium on Human Factors in Computing Systems (IHC '24)*, New York, NY, USA. Association for Computing Machinery. DOI: `https://doi.org/10.1145/3702038.3702054`.

Di Sorbo, A., Panichella, S., Alexandru, C. V., Visaggio, C. A., e Canfora, G. (2017). Surf: Summarizer of user reviews feedback. In *2017 IEEE/ACM 39th International Conference on Software Engineering Companion (ICSE-C)*, pages 55–58. DOI: `https://doi.org/10.1109/ICSE-C.2017.5`.

Dos Santos, P. S. H., Oliveira, A. D. A., De Jesus, T. B. N., Aljedaani, W., e Eler, M. M. (2024). Evolution may come with a price: analyzing user reviews to understand the impact of updates on mobile apps accessibility. In *Proceedings of the XXII Brazilian Symposium on Human Factors in Computing Systems*, IHC '23, New York, NY, USA. Association for Computing Machinery. DOI: `https://doi.org/10.1145/3638067.3638081`.

Dos Santos, P. S. H. P., Oliveira, A. D. A., e Eler, M. M. (2025). Why are accessibility app reviews rare? exploring motivations, barriers and opportunities among users with disabilities. In *Proceedings of the 20th IFIP TC13 International Conference on Human-Computer Interaction (INTERACT 2025)*, Belo Horizonte, Minas Gerais, Brazil. Springer. `https://link.springer.com/book/9783032050014`. Accessed: August 19, 2025.

Eler, M. M., Rojas, J. M., Ge, Y., e Fraser, G. (2018). Automated accessibility testing of mobile apps. In *2018 IEEE 11th International Conference on Software Testing, Verification and Validation (ICST)*, pages 116–126. IEEE. DOI: `https://doi.org/10.1109/ICST.2018.00021`.

Filipe, F., Pires, I. M., e Gouveia, A. J. (2023). Why web accessibility is important for your institution. *Procedia Computer Science*, 219:20–27. CENTERIS – International Conference on ENTERprise Information Systems / ProjMAN – International Conference on Project MANagement / HCist – International Conference on Health and Social Care Information Systems and Technologies. DOI: `https://doi.org/10.1016/j.procs.2023.01.259`.

Google (2025). Material design. `https://material.io/design/`. Accessed: February 02, 2025.

Google LLC (2025). Google play user content and comment posting policy. `https://play.google.com/about/comment-posting-policy/`. Accessed: January 01, 2025.

Guzman, E., Bhuvanagiri, P., e Bruegge, B. (2014). Fave: Visualizing user feedback for software evolution. In *2014 Second IEEE working conference on software visualization*, pages 167–171. IEEE. DOI: `https://doi.org/10.1109/VISSOFT.2014.33`.

Hedegaard, S. e Simonsen, J. G. (2013). Extracting usability and user experience information from online user reviews. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, pages 2089–2098. DOI: `https://doi.org/10.1145/2470654.2481286`.

Iacob, C. e Harrison, R. (2013). Retrieving and analyzing mobile apps feature requests from online reviews. In *2013 10th Working Conference on Mining Software Repositories (MSR)*, pages 41–44. DOI: `https://doi.org/10.1109/MSR.2013.6624001`.

Iacob, C., Harrison, R., e Faily, S. (2014). Online reviews as first class artifacts in mobile app development. In Memmi, G. e Blanke, U., editors, *Mobile Computing, Applications, and Services*, pages 47–53, Cham. Springer International Publishing. DOI: `https://doi.org/10.1007/978-3-319-05452-0_4`.

Inal, Y. (2024). I feel for you! the effect of empathy exercises on accessibility awareness. *Universal Access in the Information Society*. DOI: `https://doi.org/10.1007/s10209-023-01081-z`.

Inal, Y. e Cagiltay, N. (2024). Empathy development in digital accessibility through real-life practices in a programming course: A case study. In *Nordic Conference on Human-Computer Interaction*, NordiCHI 2024, New York, NY, USA. Association for Computing Machinery. DOI: `https://doi.org/10.1145/3679318.3685482`.

Li, X., Zhang, Z., e Stefanidis, K. (2018). Mobile app evolution analysis based on user reviews. In *SoMeT*. DOI: `https://doi.org/10.3233/978-1-61499-900-3-773`.

Liu, T., Wang, C., Huang, K., Liang, P., Zhang, B., Daneva, M., e van Sinderen, M. (2023). Rosematcher: Identifying the impact of user reviews on app updates. *Information and Software Technology*. DOI: `https://doi.org/10.48550/arXiv.2210.10223`.

McIlroy, S., Ali, N., e Hassan, A. E. (2016). Fresh apps: an empirical study of frequently-updated mobile apps in the google play store. *Empirical Software Engineering*, 21(3):1346–1370. DOI: `https://doi.org/10.1007/s10664-015-9388-2`.

Munzner, T. (2014). *Visualization analysis and design*. CRC Press, Boca Raton, FL, 1 edition. DOI: `https://doi.org/10.1201/b17511`.

Nayebi, M., Adams, B., e Ruhe, G. (2016). Release practices for mobile apps – what do users and developers think? In *2016 IEEE 23rd International Conference on Software Analysis, Evolution, and Reengineering (SANER)*, volume 1, pages 552–562. DOI: `https://doi.org/10.1109/SANER.2016.116`.

Nunes, E. H. d. C. (2025). Design e avaliação de um guia para acessibilidade em dispositivos móveis com a ABNT NBR 17060. Master's thesis, Universidade Federal do Ceará, Campus de Quixadá, Programa de Pós-Graduação em Computação, Quixadá. Ilustrações coloridas. Orientação: Profa. Dra. Ingrid Teixeira Monteiro; Coorientação: Prof. Dr. Luiz David Sales de Paula Campelo. `http://repositorio.ufc.br/handle/riufc/80318`. Accessed: May 18, 2025.

Oliveira, A. D. A. (2024). Avaliação de acessibilidade digital em aplicativos móveis a partir de revisões de usuários com deficiência visual na google play store. Tese de doutorado, Escola de Artes, Ciências e Humanidades (EACH), Universidade de São Paulo (USP), [São Paulo, SP]. `https://sucupira-legado.capes.gov.br/sucupira/public/consultas/coleta/trabalhoConclusao/viewTrabalhoConclusao.jsf?popup=true&id_trabalho=15763582`. Accessed: March 11, 2025.

Oliveira, A. D. A., Dos Santos, P. S. H., Marcílio Júnior, W. E., Aljedaani, W. M., Eler, D. M., e Eler, M. M. (2023). Analyzing accessibility reviews associated with visual disabilities or eye conditions. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*, CHI '23, New York, NY, USA. Association for Computing Machinery. DOI: `https://doi.org/10.1145/3544548.3581315`.

Oliveira, A. D. A., Freire, A. P., e Eler, M. M. (2020). Web accessibility evolution in the brazilian government. In *XVI Brazilian Symposium on Information Systems*, SBSI'20, New York, NY, USA. Association for Computing Machinery. DOI: `https://doi.org/10.1145/3411564.3411656`.

Oliveira, A. D. A., Santos, P. S. H. d., Aljedaani, W., e Eler, M. M. (2024). Exploring the influence of software evolution on mobile app accessibility: Insights from user reviews. *Journal of the Brazilian Computer Society*, 30(1):584–607. DOI: `https://doi.org/10.5753/jbcs.2024.4321`.

Oliveira, G. e Monteiro, I. (2023). Development and evaluation of the plugin for figma for accessibility documentation for interfaces - dai. In *Anais do XXII Simpósio Brasileiro sobre Fatores Humanos em Sistemas Computacionais*, Porto Alegre, RS, Brasil. SBC. DOI: `https://doi.org/10.1145/3638067.3638102`.

Oliveira, V. e Silva, V. (2012). escanner: uma ferramenta para validação de páginas web segundo o e-mag - modelo de acessibilidade de governo eletrônico. In *Anais do IV Workshop de Computação Aplicada em Governo Eletrônico*, pages 1–8, Porto Alegre, RS, Brasil. SBC. `https://sol.sbc.org.br/index.php/wcge/article/view/10138`. Accessed: March 05, 2025.

Othman, A., Dhouib, A., e Nasser Al Jabor, A. (2023). Fostering websites accessibility: A case study on the use of the large language models chatgpt for automatic remediation. In *Proceedings of the 16th International Conference on PErvasive Technologies Related to Assistive Environments*, PETRA '23, page 707–713, New York, NY, USA. Association for Computing Machinery. DOI: `https://doi.org/10.1145/3594806.3596542`.

Pagano, D. e Maalej, W. (2013). User feedback in the appstore: An empirical study. In *2013 21st IEEE International Requirements Engineering Conference (RE)*, pages 125–134. DOI: `https://doi.org/10.1109/RE.2013.6636712`.

Palomba, F., Linares-Vásquez, M., Bavota, G., Oliveto, R., Penta, M. D., Poshyvanyk, D., e Lucia, A. D. (2015). User reviews matter! tracking crowdsourced reviews to support evolution of successful apps. In *2015 IEEE International Conference on Software Maintenance and Evolution (ICSME)*, pages 291–300. DOI: `https://doi.org/10.1109/ICSM.2015.7332475`.

Palomba, F., Linares-Vásquez, M., Bavota, G., Oliveto, R., Penta, M. D., Poshyvanyk, D., e Lucia, A. D. (2018). Crowdsourcing user reviews to support the evolution of mobile apps. *Journal of Systems and Software*, 137:143 – 162. DOI: `https://doi.org/10.1016/j.jss.2017.11.043`.

Panichella, S., Sorbo, A. D., Guzman, E., Visaggio, C. A., Canfora, G., e Gall, H. C. (2015). How can i improve my app? classifying user reviews for software maintenance and evolution. In *2015 IEEE International Conference on Software Maintenance and Evolution (ICSME)*, pages 281–290. DOI: `https://doi.org/10.1109/ICSM.2015.7332474`.

Park, K., Goh, T., e So, H.-J. (2014). Toward accessible mobile application design: developing mobile application accessibility guidelines for people with visual impairment. In *Proceedings of HCI Korea*, pages 31–38. DOI: `https://dl.acm.org/doi/proceedings/10.5555/2729485`.

Pelloni, L., Grano, G., Ciurumelea, A., Panichella, S., Palomba, F., e Gall, H. C. (2018). Becloma: Augmenting stack traces with user review information. In *2018 IEEE 25th International Conference on Software Analysis, Evolution and Reengineering (SANER)*, pages 522–526. DOI: `https://doi.org/10.1109/SANER.2018.8330252`.

Portal do Governo Brasileiro (2014). eMAG: Modelo de acessibilidade em governo eletrônico. `http://emag.governoeletronico.gov.br/`. Accessed: March 05, 2025.

Power, C., Freire, A., Petrie, H., e Swallow, D. (2012). Guidelines are only half of the story: Accessibility problems encountered by blind users on the web. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, CHI '12, page 433–442, New York, NY, USA. Association for Computing Machinery. DOI: `https://doi.org/10.1145/2207676.2207736`.

Reyes Arias, J. E., Kurtzhall, K., Pham, D., Mkaouer, M. W., e Elglaly, Y. N. (2022). Accessibility feedback in mobile application reviews: A dataset of reviews and accessibility guidelines. In *Extended Abstracts of the 2022 CHI Conference on Human Factors in Computing Systems*, CHI EA '22, New York, NY, USA. Association for Computing Machinery. DOI: `https://doi.org/10.1145/3491101.3519625`.

Serra, L. C., Carvalho, L. P., Ferreira, L. P., Vaz, J. B. S., e Freire, A. P. (2015). Accessibility evaluation of e-government mobile applications in brazil. *Procedia Computer Science*, 67:348 – 357. DOI: `http://dx.doi.org/10.1016/j.procs.2015.09.279`.

Shneiderman, B. (1996). The eyes have it: A task by data type taxonomy for information visualizations. In *Proceedings 1996 IEEE symposium on visual languages*, pages 336–343. IEEE. DOI: `https://doi.org/10.1109/VL.1996.545307`.

Silveira, L. A. d., Aljedaani, W., e Eler, M. M. (2024). Strategic insights into integrating accessibility in software development: Motivations, barriers, commitments, and business value. In *Proceedings of the Brazilian Symposium on Human Factors (IHC)*, pages 1–14. ACM. DOI: `https://doi.org/10.1145/3702038.3702108`.

Valerio, M. (2019). Acessibilidade toolkit: Entendendo de uma vez por todas a wcag. In *Anais Estendidos do XVIII Simpósio Brasileiro sobre Fatores Humanos em Sistemas Computacionais*, pages 13–14, Porto Alegre, RS, Brasil. SBC. DOI: `https://doi.org/10.5753/ihc.2019.8378`.

W3C (2025a). Web content accessibility guidelines 2 (wcag 2). `https://www.w3.org/TR/WCAG22/`. Accessed: January 12, 2025.

W3C (2025b). World wide web consortium. `https://www.w3.org/`. Accessed: June 18, 2025.

Ware, C. (2019). *Information visualization: perception for design*. Morgan Kaufmann. DOI: `https://dl.acm.org/doi/book/10.5555/2285540`.

Yan, S. e Ramachandran, P. (2019). The current status of accessibility in mobile apps. *ACM Transactions on Accessible Computing (TACCESS)*, 12(1):1–31. DOI: `https://doi.org/10.1145/3300176`.