



Challenges and barriers faced by blind and visually impaired users on social media: a systematic literature review

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Accepted: 18 June 2025 / Published online: 7 July 2025

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Abstract

The rapid growth of social media usage includes an increasing number of blind and visually impaired (BVI) users who face distinct accessibility challenges on these platforms. This study conducts a systematic literature review of 54 peer-reviewed publications to identify and categorize the primary accessibility issues impacting BVI users on social media. Key challenges include complex navigation, insufficient multimedia descriptions, and limited integration of assistive technologies, all of which hinder BVI users' engagement and interaction with content. The analysis also reveals gaps in platform-specific accessibility features and inconsistencies in applying accessibility standards. By highlighting these issues, this review offers targeted solutions and practical recommendations for social media developers and accessibility experts to enhance digital inclusivity for BVI users. The insights provided aim to inform the development of more accessible and universally designed social media experiences.

Keywords Accessibility · Blind and visually impaired (BVI) · Social media · Literature review · Universal design

1 Introduction

The widespread adoption of social media over the past two decades has been primarily driven by the proliferation of smartphones [1]. Additionally, the capacity of these platforms to facilitate global content sharing at minimal cost has contributed to a continuous increase in their use. Social media facilitate global connectivity [2], offer a space for

self-expression [3], and provide access to a wealth of information [4]. Given the pervasive influence of social media, it has become increasingly difficult to imagine modern life without these platforms [5, 6]. However, concerns surrounding equitable access for people with disabilities (PwD) have gained greater attention [7–10]. The inaccessibility of social media platforms can have profound consequences for PwD [11–17]. These limitations not only restrict social participation but also impede access to information, opportunities for learning, and overall quality of life [18, 19].

The digital divide, particularly the inaccessibility of social media platforms, limits the ability of people with disabilities (PwD) to fully utilize the potential of social media, whether for social interaction, professional networking, or accessing essential services [20]. In critical situations, such as emergencies, restricted access to social media can further heighten vulnerability by impeding access to real-time information and support systems [21]. However, beyond crises, the inability to engage equitably with social media can lead to social isolation and hinder personal development [22, 23].

Among PwD, blind and visually impaired individuals (BVI) face unique challenges in accessing and navigating social media platforms [24]. Blindness and visual impairment affect approximately 2.2 billion people globally [25, 26], including 20 million in the United States [27], which

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presents substantial barriers to equitable engagement with digital spaces. Research indicates that the motivations of visually impaired users for engaging with social media largely align with those of sighted individuals, encompassing social interaction, information seeking, entertainment, relaxation, and convenience [28, 29]. However, for BVI users, these motivations are often amplified due to their heightened risk of social isolation. Social media platforms, therefore, play a critical role in reducing this isolation by facilitating social connections and enabling meaningful participation in virtual communities, thus helping to mitigate the mental health challenges associated with social exclusion.

Several studies have examined the use of social media by BVI users. For instance, Khasawneh [30] investigated the perceptions of BVI users regarding the accessibility of platforms such as Instagram, Twitter, and Facebook. Fuglerud et al. [31] explored the social media usage patterns of BVI users in Norway. In contrast, Bennett et al. [32] focused on the engagement strategies of young BVI users on social media. Wu et al. [24] specifically studied the use of Facebook by visually impaired individuals. Other studies advocating for accessibility in developers' discussion [33–35], embedding accessibility in software engineering [36–38], and utilizing Artificial Intelligence with accessibility [35, 39, 40].

Despite these valuable contributions, no prior research has systematically synthesized the available literature on social media use by BVI individuals. Although one relevant study by Gkatzola and Papadopoulos [41] addressed the subject of social media use by BVI users, their study lacked a detailed exploration of the accessibility challenges specific to BVI individuals. Furthermore, their review was limited to publications from 2011 to 2022, which constrained the scope of their analysis.

In this study, we aim to systematically identify and outline the accessibility challenges reported in the literature concerning the use of social media by BVI users and highlight critical gaps that remain unaddressed. To the best of our knowledge, this study is the first to systematically review and analyze research articles focused exclusively on the accessibility of social media for BVI users. The findings of this study will serve as a roadmap for advancing accessibility research, particularly in the context of evolving social media platforms and emerging technologies.

1.1 Existing SLRs on social media for PwD

Several researchers have conducted systematic literature reviews (SLRs) on social media usage among people with disabilities (PwD). For instance, Jacob et al. [42] reviewed 13 studies published between 2015 and 2023, focusing on the use of social media by individuals with intellectual disabilities. Their findings highlighted the unique barriers faced

by this group, particularly in terms of online engagement and accessibility. Pirrone et al. [43] explored how digital humanities have contributed to enhancing cultural accessibility for PwD. Their review, which covered literature published between 2018 and 2022, emphasized the role of digital technologies in improving access to cultural experiences, yet acknowledged that many people with disabilities (PwD) still face significant challenges in fully benefiting from these innovations. Anderson et al. [44] conducted a review of studies published between 2000 and 2021, focusing on the use of social media by adults with intellectual disabilities, including the training, experiences, and outcomes associated with these platforms. Their findings highlighted cost and design elements as key factors contributing to social media inaccessibility for this group. Beart et al. [45] conducted a scoping review examining how individuals with intellectual disabilities perceive their social identity and how this identity influences their interactions with social media. The review highlighted the social and psychological impacts of these identity perceptions on online engagement. Pacocha et al. [46] reviewed the correlation between social media use and its impact on mental health, emphasizing the potential negative consequences of unrestricted access. Their review found that excessive social media use can lead to mood disorders, anxiety, depression, and lowered self-esteem, particularly among vulnerable populations, including those with disabilities. Trescher et al. [47] explored barriers faced by individuals with cognitive disabilities in accessing social media platforms. Their analysis, based on expert interviews, provided insights into the broader challenges of creating digital environments that are more accessible for individuals with cognitive impairments. There is a notable gap in the existing literature concerning the accessibility of social media platforms, specifically for BVI users. Unlike previous review studies, this study imposes no time restrictions, which allows us to conduct a more comprehensive analysis of the available literature. Additionally, our study makes a unique contribution by identifying and categorizing specific accessibility issues faced by BVI users when interacting with social media, as documented in the literature. Although many of the issues discussed in this study are also commonly found in interactive systems, our specific focus on social networks contributes to the current knowledge in the field and highlights the need to increase the accessibility of such platforms.

1.2 Research questions

To investigate the challenges faced by BVI users in accessing social media and to meet the objectives of this study, we propose the following research questions (RQs) and sub-research questions (sub-RQs) to guide this SLR study.

RQ1: What are the primary accessibility challenges faced by BVI users when interacting with social media platforms?

With this research question, we aim to identify and synthesize the main challenges that BVI users encounter when using social media platforms. The findings of this RQ will provide valuable insights into the recurring barriers reported in the literature, serving as the basis for further exploration in this systematic literature review (SLR) and informing future decisions by researchers, designers, and developers on improving social media accessibility.

RQ2: Which accessibility guidelines are frequently studied in the literature?

This question aims to determine the extent to which established guidelines, such as the Web Content Accessibility Guidelines (WCAG), are referenced and evaluated in studies related to social media accessibility for BVI users.

RQ3: Which accessibility features are most frequently requested by BVI users according to the literature?

This research question aims to capture the feature requests of BVI users, as documented in research studies, better to understand user-driven demand for improvements in social media accessibility.

RQ4: Which social media platforms have been studied in the literature for BVI users?

This research question focuses on identifying the social media platforms that have been most frequently analyzed in the academic literature for their accessibility features or limitations concerning BVI users. The findings of this RQ will provide valuable insights into the platforms that have received significant attention and which may require further study. This RQ is expanded through the following sub-questions.

RQ4_a: What accessibility features are present in social media platforms for BVI users?

This sub-question aims to investigate the accessibility features implemented across various social media platforms to support BVI users. The findings of this sub-question will provide an overview of the current tools available to enhance accessibility for BVI users.

RQ4_b: What are the accessibility challenges associated with each social media platform?

This sub-question focuses on uncovering the platform-specific accessibility challenges reported by BVI users. By analyzing these challenges, we aim to identify recurring issues that hinder full accessibility on popular social media platforms.

RQ5: What are the limitations of current assistive tools in ensuring full accessibility for BVI users on social media?

This research question aims to identify the persistent challenges associated with existing assistive technologies. The findings of this sub-question will provide a deeper

understanding of the limitations that prevent full social media accessibility for BVI users and inform the development of more effective and seamless assistive technologies that can better meet the needs of BVI users in social media environments.

RQ6: How has the number of studies on social media accessibility for BVI users evolved over time?

This research question aims to investigate the temporal distribution of studies on social media accessibility for BVI users. We aim to explore the trend of research over the years contributing to this body of literature. The findings of this RQ will provide insights into key trends in research activity in producing literature on social media accessibility for BVI users.

1.3 Contributions

The key contributions of this research are outlined below:

- A systematic literature review encompassing 54 peer-reviewed studies focused on the accessibility of social media platforms for blind and visually impaired (BVI) users;
- A comprehensive analysis and categorization of the primary accessibility challenges encountered by BVI users on social media platforms as documented in the selected pool of publications;
- Platform-specific assessments of accessibility, identifying unique challenges and feature gaps on widely used social media platforms;
- An in-depth evaluation of accessibility issues related to the integration of assistive technologies with social media platforms, identifying compatibility challenges and functionality limitations;
- Identification of potential solutions to address the accessibility challenges faced by BVI users on social media, with emphasis on design and technological improvements;
- A geographical and temporal analysis of the reviewed publications to provide insights into research trends in social media accessibility for BVI users;
- A discussion of findings with recommendations for enhancing social media accessibility for BVI users, highlighting critical factors to consider for future accessibility improvements;
- A replication package of our survey for extension purposes [48].

The remainder of this paper is structured into six sections. The approach used for data collection, inclusion and exclusion of publications, and the synthesis process is elaborated in Sect. 2. The results for each research question are presented and discussed in Sect. 3. Following this, we present

the takeaways of this review study in Sect. 4. We further present practical and theoretical implications in Sect. 5. Finally, we conclude this study in Sect. 7.

2 Methodology

We aimed to systematically catalog and synthesize the relevant literature by following the SLR guidelines by Kitchenham et al. [49–52]. This methodology enables an unbiased aggregation of existing knowledge to provide insights into the current state of accessibility challenges and opportunities for BVI users in social media environments. Our process followed a three-step strategy:

1. **Planning:** Identification, screening, and validation of publications from selected digital libraries based on specific inclusion and exclusion criteria;
2. **Execution:** A rigorous filtering process to eliminate irrelevant studies and focus on those directly addressing accessibility and BVI users;
3. **Synthesis:** Classification and analysis of extracted data to answer the research questions, followed by a discussion of identified gaps and areas for future research.

2.1 Planning

The literature search was conducted across several digital libraries, which are known for their reliability and scientific rigor. The digital libraries employed include ACM Digital Library,¹ IEEE,² Science Direct,³ Scopus,⁴ Springer,⁵ and Web of Science.⁶ These libraries were selected due to their wide coverage of peer-reviewed journals and their relevance to accessibility, technology, and social media studies.

2.1.1 Inclusion and exclusion criteria

The inclusion and exclusion criteria were applied to ensure the relevance and quality of the studies included in the review [53]. These criteria ensure that only publications that contribute to our research questions (RQs) are included. We conducted this research without an initial restriction on publication date to capture the earliest research on social media accessibility, from the most recent advancements to the earliest findings. The following criteria were applied:

Inclusion Criteria:

- Papers focused on social media and accessibility;
- Papers written in English;
- Papers available in digital formats;
- Papers addressing issues relevant to blind, visually impaired, or low-vision users.

Exclusion Criteria:

- Non-academic sources such as websites, leaflets, and grey literature;
- Papers without full-text access online;
- Studies focused on social interaction aspects within a purely medical context.

The inclusion and exclusion criteria helped refine the search and ensure the studies were directly relevant to the research focus on social media accessibility for BVI users.

2.1.2 Search strategy

A pilot search [54–56] was conducted in two major databases, IEEE Xplore and ACM Digital Library, both of which are renowned for their comprehensive collections of research in the fields of computer science, accessibility, and human-computer interaction. Two authors conducted a manual pilot search in these databases using keywords related to social media accessibility for visually impaired users. This preliminary search helped identify relevant keywords and phrases that could best capture the scope of our study. The two authors listed these terms that were mentioned in the resultant scholar-ships and after a few iterations of discussion among the authors and refining the search string, these keywords are divided into three groups of terms - social media ($T1$), accessibility ($T2$), and visual impairments ($T3$) to carry out the search systematically. We build a search query to cover all combinations of keywords from the three terms. We have employed the AND operator to combine high-level $T1$, $T2$, and $T3$ terms and the OR operator. For example, within $T1$, terms such as “social media” OR “social networks” OR “social networking sites” are combined; within $T2$, terms such as “accessibility” OR “A11y” OR “WCAG” are combined; and within $T3$, terms such as “blind” OR “low vision” OR “visually impaired” are combined. The resulting groups are then linked using the AND operator to generate a final query that retrieves studies addressing all three aspects simultaneously. The final search string is provided in Table 1.

We applied this search string to the title, abstract, and metadata of publications to ensure we focused on studies explicitly addressing the relevant topics while avoiding false

¹ <https://dl.acm.org/>.

² <https://ieeexplore.ieee.org/>.

³ <https://www.sciencedirect.com/>.

⁴ <https://www.scopus.com/>.

⁵ <https://www.springer.com/>.

⁶ <https://webofknowledge.com/>.

positives that could arise from irrelevant sections of full-text documents.

2.2 Execution

The execution phase involved processing publications obtained from digital libraries. The initial search yielded a total of 5,209 publications retrieved based on the defined search string. We collected metadata, including the title, abstract, year of publication, and source of the publication, in this step. Following that, we implemented a four-phase procedure to filter the publications. Figure 1 shows the search execution process.

The first filtering stage involved eliminating duplicate records and retracted publications from the initial pool. Duplicates often arise when papers are indexed in multiple digital libraries, while retracted publications are removed to maintain the integrity and quality of the review. This process resulted in the removal of 329 publications, reducing the pool to 4880 unique studies.

In the second phase, the titles and abstracts of the remaining publications were carefully screened to ensure that they aligned with the inclusion and exclusion criteria. At this stage, studies that did not focus on accessibility or social media for BVI users were excluded, along with papers that were not available in full text, were not written in English, or addressed medical aspects of social interaction rather than

the broader accessibility challenges of social media platforms. A total of 4741 publications were excluded during this phase, leaving 139 papers for full-text evaluation.

In the third phase, a thorough full-text review of the 45 remaining publications was conducted to assess their relevance and quality. Each paper was evaluated based on its relevance to the research questions and its focus on social media accessibility for BVI users. At this stage, papers that did not meet the criteria (e.g., those with limited focus on BVI users or insufficiently addressing accessibility barriers) were excluded. This resulted in the exclusion of 94 papers, leaving a final set of 45 publications for in-depth analysis.

Finally, we applied backward [57] and forward snowballing techniques [58] to identify additional relevant studies from the initial pool and ensure that no significant research was overlooked. This involved reviewing the references of the remaining 45 papers and identifying additional relevant studies that may have been missed in the initial search. We obtained an additional 9 publications that met our inclusion criteria. This resulted in a final dataset of 54 papers.

2.3 Synthesis

This phase involves the systematic synthesis of extracted data to answer the posed research questions. To begin answering RQ1, we categorized the identified accessibility challenges in the literature, such as difficulties in navigating

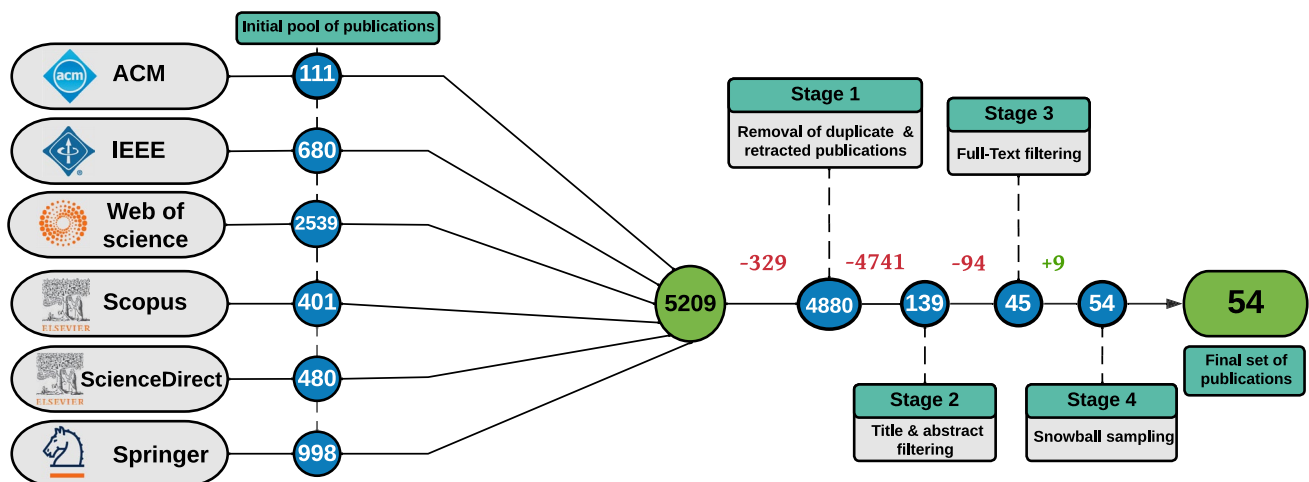


Fig. 1 Overview of publications filtering process

Table 1 Search string used in this research to extract relevant studies

T1	T2	T3
Social media, social networks, social web-sites, social networking services (SNSs), youtube, twitter, instagram, linkedin, facebook, tiktok, reddit, snapchat	AND accessibility, A11y, inclusiveness, WCAG	AND blind, visually impaired, vision impairment

Table 2 Categories of accessibility issues

No.	Category	Description
1	Navigation and usability	Challenges in platform navigation due to complex layouts, inconsistent labeling, poor keyboard accessibility, and difficulty in locating content
2	Visual content issues	Barriers in perceiving images and multimedia, including missing alternative text, inaccurate media descriptions, and inaccessible embedded text
3	Audio and feedback accessibility	Deficiencies in auditory feedback, such as insufficient sound cues, lack of speech guidance, and inadequate audio descriptions
4	Device and platform-specific issues	Accessibility limitations due to app restrictions, frequent updates, and inconsistent assistive technology support across devices
5	Customization and personalization	Limited options for adapting interface settings, modifying accessibility preferences, and customizing user experiences
6	Privacy and security	Challenges with CAPTCHA authentication, content moderation, third-party security tools, and maintaining data confidentiality
7	Third-party dependency	Reliance on external assistive technologies that may not fully integrate with platforms, leading to inconsistencies and limited functionality
8	Cognitive load and distractions	Increased mental effort due to cluttered interfaces, overwhelming navigation, frequent content updates, and distracting elements like autoplay media
9	Editing and content management	Barriers in creating, modifying, and organizing content, including inaccessible annotation tools and limited support for inclusive content adaptation

visual interfaces, interacting with multimedia content, and understanding complex layouts. We also categorized publications based on their focus on established accessibility guidelines, such as the Web Content Accessibility Guidelines (WCAG), to determine which standards are most frequently evaluated (RQ1_a). Furthermore, we identified the features reported in the literature that pose accessibility issues in social media for BVI users (RQ1_b), as well as the accessibility features most requested by BVI users (RQ1_c). To address RQ2, we cataloged the social media platforms that have been the focus of academic research on BVI accessibility. We further categorized studies by examining the accessibility features available on these platforms (RQ2_a) and synthesizing the platform-specific accessibility challenges faced by BVI users (RQ2_b). In addition, we synthesized findings from studies that explored the assistive technologies, such as screen readers and voice assistants, that are most frequently used by BVI users when navigating social media platforms to answer RQ3. We categorized the studies based on the specific technologies analyzed, identifying those that were most effective in enhancing accessibility for BVI users (RQ3_a). The analysis also revealed significant limitations of these assistive technologies, which were further categorized to answer RQ3_b. We also synthesized the temporal and geographical distribution of studies related to social media accessibility for BVI users to answer RQ4. Understanding these temporal and geographical trends helps identify areas where further research and development are needed to ensure a more inclusive global digital environment for BVI users.

Throughout the synthesis process, all data related to the posed research questions (RQs) were carefully peer-reviewed

to mitigate bias and ensure accuracy. To facilitate collaboration and transparency during data extraction, we recorded and organized the findings using structured data sheets, ensuring that all extracted information was systematically analyzed and documented. The results of this synthesis provide a detailed, comprehensive overview of the accessibility challenges, assistive technologies, and geographical trends in research related to social media platforms for BVI users. As previously discussed, to ensure the reliability of our results, we have only selected studies made available on reputable platforms. Furthermore, all analyses that required pinpointing specific accessibility issues or challenges were conducted by two researchers following a systematic approach.

3 Results

This section presents the results of the posed research questions.

3.1 RQ1: What are the primary accessibility challenges faced by BVI users when interacting with social media platforms?

Analysis. To answer RQ1, we conducted a structured analysis of the existing literature on accessibility challenges encountered by BVI users on social media platforms. Then, we systematically extracted and cataloged the accessibility issues identified in each primary study (PS). These issues were further classified into nine categories (defined in Table 2) to integrate the findings and provide

a comprehensive overview of the primary challenges. The frequency of each accessibility issue was quantified across studies to underscore the relative significance of each challenge within the literature.

Results. Table 3 presents a range of accessibility challenges faced by BVI users on social media platforms as documented in the literature. Our analysis revealed a total of 47 unique accessibility challenges affecting BVI users, which were further classified into 9 categories.

Navigation & Usability. The social media platforms are often designed with complex and visually dense layouts that present significant accessibility challenges to navigation and usability for BVI users [59–64]. “Navigation Complexity” poses a challenge in understanding the interface structure and locating key functions, which makes it difficult for the BVI users to interact seamlessly with various platform features [59–76]. “Dynamic Content Issues” further complicate the user experience of BVI users as screen readers can disrupt the navigation flow as they struggle to consistently track or interpret new elements [59, 77]. BVI users often rely on screen readers to comprehend the information on digital platforms; however, “Inconsistent Labeling” of buttons, text boxes, or links will result in unclear cues for the screen readers [59, 64, 74, 77–80]. The literature also mentions “Error/Warning Feedback Issues” as an accessibility barrier for BVI users on social media platforms. This issue arises when error messages or warnings are not communicated in an accessible format, which prevents BVI users from understanding issues in real-time [62, 64, 74, 77, 79]. Furthermore, we found “Complicated Layouts” [72, 75, 77, 78] to be the reason for adding cognitive load for BVI along with “Inaccessible Action Buttons” [62, 63, 81] such as comment and logout options which restrict their interaction with key social functions. BVI users utilize keyboard shortcuts. However, the literature mentions “Keyboard Navigation” to be an accessibility issue in social media platforms for BVI users [70, 78, 82]. Other accessibility issues that limited the navigation and usability of BVI users involve “Pop-up Message Navigation Issues” [83], “Difficulty Skipping to Relevant Content” [84], “Unfamiliar Icons and Symbols” [71] and “PDF and Document Accessibility” [76].

Visual Content Issues. The growing popularity of visual content on social media platforms presents various accessibility challenges for BVI users. The majority of BVI users face accessibility issues due to a lack of descriptive text for non-static media, which leads to missed context and decreases engagement. We found “Lack of ALT Text for Images” as one of the most prominent accessibility issues for BVI users, which hinders their ability to understand the image content, which is crucial in this era of visual content [60, 62, 64, 65, 69, 73, 78, 83, 85–92]. Similarly, “Inaccessible Photo Content” restricts access to image-based interactions when ALT text is unavailable or inadequate [63,

82, 93]. Another accessibility issue is the “Difficulty with Visual Media” such as videos, GIFs, [66, 69, 94] where the absence of “ALT Text or Transcriptions for Media” further limits accessibility [64, 65, 88, 90, 95]. The literature mentioned several accessibility issues regarding media accessibility, such as “Inaccurate Media Captions/Descriptions” as incomplete or incorrectly labeled captions create confusion rather than aiding in understanding [73, 83, 86, 96–98]. Social media often lacks adequate support for GIFs and Videos, where embedded elements are inaccessible or poorly integrated for screen reader functionality. “ALT-TEXT for GIFs and Stickers” is another underdeveloped area, as social media platforms seldom provide captioning for these popular content types [87, 90]. The literature also documents “Inaccessible Embedded Text in Images” [66, 92] and “Unreadable Hashtags” [88, 95] as accessibility issues as they prevent screen readers from identifying essential textual information. Additionally, we found “Complexity of Adding ALT Text” as another accessibility challenge documented in the literature, which prevents BVI users from enhancing image accessibility independently [89, 98, 99].

Audio & Feedback Accessibility. Audio and feedback cues are essential for BVI users to navigate and understand the content on social platforms, yet we found several barriers in the literature that pose accessibility issues for BVI users in this area. We found that BVI users face challenges in interpreting the multi-element interfaces due to “Sound Localization Challenges”, which disrupt the ability to identify where audio originates on a page [100]. This accessibility issue is further amplified by the “Lack of Granularity in Audio Cues”, which reduces the effectiveness of sound feedback, failing to provide precise spatial orientation cues [70, 79, 100, 101]. Moreover, the Lack of audio description and feedback for media further limits accessibility by depriving BVI users of the necessary context for audio-visual content [68, 72, 95, 102]. In addition, the ‘Lack of Context for Social Events’ has an impact on real-time social media interactions, as insufficient contextual feedback makes it difficult for users to comprehend event-related updates [88] accurately.

Device and Platform-Specific Issues. Social media accessibility challenges are often amplified by the limited features of the device. According to Zhang et al. [95], “Complexity of Mobile Apps” introduces added layers of navigation difficulty due to compact and dense online platform interfaces and limited customization options. Moreover, “Limited Features for Smartphones” further hinder the functionality for BVI users, as certain accessibility features may be unavailable or poorly adapted to mobile formats [61, 63]. Notably, the literature documented “App/Website Updates” resulting in accessibility issues for BVI users since the updates can introduce new barriers when accessibility features are not prioritized or altered without proper testing [80, 85]. Voykinska et al. [65] found that the lack of accessibility

Table 3 Accessibility challenges for BVI users on social media platforms as reported in literature. (cont.)

Category	Accessibility Issue	Studies	Count
Navigation & Usability	Dynamic Content Issues	PS1, PS4	2
	Inconsistent Labelling (Buttons, Textbox, Links)	PS1, PS4, PS8, PS17, PS45, PS47, PS54	6
	Error/Warning Feedback Issue	PS4, PS5, PS8, PS45, PS47	5
	Navigation Complexity	PS1, PS2, PS3, PS5, PS6, PS8, PS11, PS20, PS23, PS25, PS32, PS34, PS40, PS41, PS44, PS45, PS50, PS53	17
	Complicated Layout	PS4, PS17, PS41, PS50	4
	Inaccessible Action Buttons (like, comment, logout)	PS5, PS6, PS31	3
	Pop-up message navigation issues	PS24	1
	Difficulty in Skipping to Relevant Content	PS46	1
	Unfamiliar icons, symbols	PS40	1
	PDF and document accessibility	PS53	1
Visual Content Issues	Keyboard navigation issues	PS17, PS21, PS34	3
	Lack of ALT Text for Images	PS2, PS5, PS8, PS10, PS11, PS17, PS22, PS24, PS27, PS29, PS32, PS36, PS38, PS42, PS44, PS48	15
	Inaccessible Photo Content	PS6, PS13, PS21	3
	Difficulty with Visual Media	PS7, PS20, PS32	3
	Lack of ALT Text or Transcriptions for Media	PS8, PS11, PS29, PS38, PS52	5
	Inaccurate Media Captions/Descriptions	PS14, PS16, PS22, PS24, PS35, PS44	6
	Lack of Support for GIFs and Videos	PS26, PS27, PS52	3
	Lack of ALT-TEXT for GIFs and Stickers	PS27, PS38	2
	Inaccessible Embedded Text in Images	PS20, PS48	2
	Unreadable Hashtags	PS29, PS52	2
Audio & Feedback Accessibility	Complexity of Adding ALT Text	PS35, PS36, PS37	3
	Sound Localization Challenges	PS9	1
	Lack of Granularity in Audio Cues	PS9, PS28, PS34, PS47	4
	Lack of Audio Description/Feedback	PS12, PS25, PS41, PS52	4
	Lack of Context for Social Events	PS9	1
	Complexity of Mobile Apps	PS2	1
	Limited Features for Smartphones	PS3, PS6	2
	App/Website Updates	PS10, PS54	2
	Uploading and Posting Photos	PS11	1
	Color Contrast Issues	PS17	1
Device and Platform-Specific Issues	Zooming Issues	PS18	1
	Profile Customization Challenges	PS10	1
	Lack of Personalization	PS15, PS46	2
	Lack of Visual Reference (activities)	PS14	1
	Challenges with Selfies	PS18, PS19	2
	Privacy Concerns	PS3, PS10, PS13, PS16	4
	Trust in Algorithm (Automated Caption, ALT Text)	PS16, PS35, PS37, PS42	4
	Inaccessible CAPTCHA	PS2, PS17	2
	Third-Party Tools and System Dependencies	PS26, PS32, PS35, PS41, PS51	5
	Lack of Access to User Training and Technology	PS21, PS35, PS36, PS37	4
Third-Party Dependency	Lack of Assistive Technologies	PS49	1
	Lack of Accessibility for Misinformation Labels	PS45, PS47, PS50	3
	Cognitive Load	PS23, PS39, PS40	3
	Dynamic Content Issues	PS1, PS4	2
	Ephemeral Content	PS18, PS20	2
	Advertisements and Distracting Content	PS20	1

Table 3 (continued)

Category	Accessibility Issue	Studies	Count
Editing & Content Management	Content Editing Challenges	PS18, PS19, PS25, PS31, PS51, PS54	6
	Uploading and Posting Photos	PS11	1

features to tag, caption, or edit images appropriately can cause issues in “Uploading and Posting Photos”. Liu and Chen showed that [78] “Color Contrast Issues” limit visual accessibility, which affects low-vision users who rely on high-contrast displays to comprehend interface elements. Another accessibility challenge for BVI users is the “Zooming Issues”, which present difficulties when standard Zoom options are either unavailable or incompatible with the layout of social media platform [103].

Customization & Personalization. The customization of social media is limited for BVI users, resulting in several accessibility issues. The user experience is reduced by the lack of personalization features for BVI users, which fail to accommodate their specific visual needs [84, 104]. Similarly, Morris et al. [65] found that BVI users are unable to personalize their profiles since certain options or fields are not supported by screen readers. A study by MacLeod et al. [96] showed that the visual notifications amplify the accessibility issue for BVI users due to the lack of an audio-friendly format. Moreover, BVI users also face accessibility issues in capturing selfies due to poor camera and interface integration, which hinders their ability to participate in visual-sharing features without sighted assistance [103, 105].

Privacy & Security. Privacy and security features on social media often fail to consider accessibility needs, which introduces barriers and potential risks for BVI users. “Privacy Concerns” arise when BVI users rely on third-party accessibility tools or human assistance, which may inadvertently expose personal data [61, 85, 93, 97]. Additionally, BVI users often find the captions generated by auto-captioning features inaccurate and unreliable, which results in lower “Trust in Algorithmic Tools” [91, 97–99]. It is important to note that many social media platforms use CAPTCHA to verify users. This feature relies heavily on visual input, creating a reliance on external help to access secure content for BVI users [60, 78].

Third-Party Dependency. We found several accessibility issues in the literature concerning the dependency of information access and comprehension using third-party tools. These tools can limit the effectiveness of accessibility tools, mainly if they are incompatible with social media features [69, 72, 98, 106, 107]. Furthermore, “Lack of Access to User Training and Technology” limits familiarity with both built-in and third-party accessibility features, which restricts the BVI users from using most of the platform functionalities [82, 89, 98, 99]. Khan et al. [108] found the “Lack

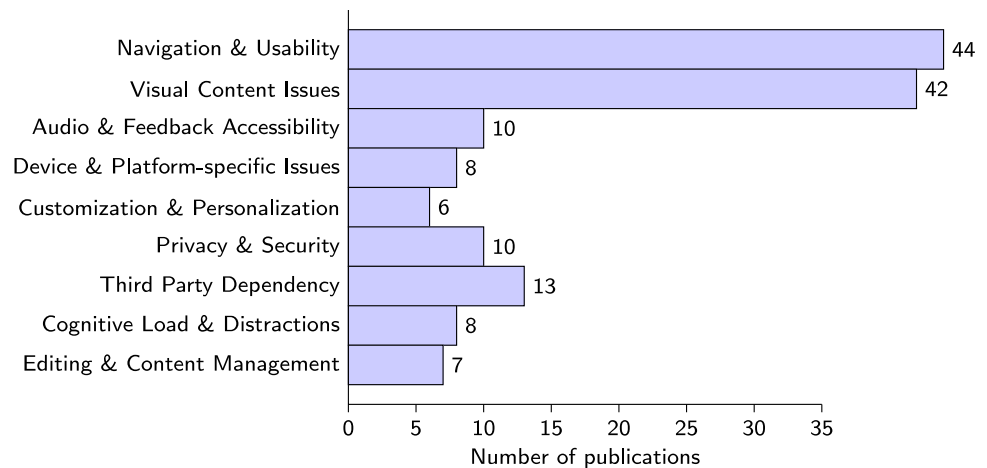
of Assistive Technologies” on social platforms resulting in restriction of independent navigation and interpretation of content. Along these lines, the “Lack of Accessibility for Misinformation Labels” prevents BVI users from distinguishing between factual and potentially misleading information [74, 75, 79].

Cognitive Load & Distractions. High cognitive load and distractions on social media increase the accessibility issues that BVI users experience. Social media platforms with complex design, inconsistent labeling, or challenging navigation paths increase cognitive load [67, 71, 109]. “Dynamic Content Issues” generate cognitive strain because users must constantly readjust themselves to changing information, which screen readers may not capture accurately [59, 77]. “Ephemeral Content” adds another layer of complexity because temporary posts can be difficult to monitor or return using assistive technologies [66, 103]. In addition, the “Advertisements and Distracting Content” make it difficult for BVI users to concentrate on relevant information [66].

Editing & Content Management. BVI users face notable barriers when trying to create and manage content independently on social platforms. Multiple studies in literature stated that the editing tools in social media platforms lack compatibility with the screen reader, which poses “Content Editing Challenges” for BVI users [68, 80, 81, 103, 105, 107]. According to Voykinska et al. [65], “Uploading and Posting Photos” poses an accessibility challenge for BVI users due to the lack of accessible options for tagging, captioning, and previewing images.

Findings. Figure 2 showcases the frequency of categories reported in the literature. A majority of studies in the literature identify “Navigation & Usability” as a primary accessibility issue on social media platforms for BVI users, with this category reported in $n = 44$ studies. Within this category, “Navigation Complexity” is the most frequently cited challenge, reported in $n = 17$ studies, representing 38.6% of the studies that discuss “Navigation & Usability” issues. The second most reported category is “Visual Content Issues”, identified in $n = 42$ studies. The most prominent concern within this category is the “Lack of ALT Text for Images”, cited in approximately 35% of the studies. These findings suggest that BVI users frequently encounter significant accessibility challenges when navigating social media platforms. The inaccessibility of visual content, in particular, poses a substantial barrier to their inclusive participation. Developers should prioritize the implementation

Fig. 2 Frequency of categories reported in the pool of primary studies



of robust accessibility features to ensure that BVI users can fully engage with social media content to foster a more inclusive experience. We also found "Third-Party Dependency" as another prevalent accessibility issue reported in $n = 13$ studies. Within this category, "Third-Party Tools and System Dependencies" emerge as the primary concern, identified in $n = 5$ studies, underscoring a major accessibility barrier for BVI users who rely on external support to navigate social media platforms effectively. Additionally, "Privacy & Security" and "Audio & Feedback Accessibility" are each reported as accessibility issues in $n = 10$ studies. These findings highlight the essential areas that require focused improvement to improve inclusivity on social media platforms for BVI users.

3.2 RQ2: Which accessibility guidelines are frequently studied in the literature?

Analysis. To address RQ2, we systematically examined the accessibility guidelines referenced in the selected publications. Each guideline was identified, documented, and quantified based on its frequency of citation and level of adherence within the literature. This analysis provided insights into the most commonly referenced guidelines and their significance in accessibility research.

Results. Accessibility guidelines are a set of standards focused on enhancing the digital inclusivity for users with varying abilities [110–112]. We found several accessibility guidelines referenced in the literature. These are discussed below.

Web Content Accessibility Guidelines. All versions of WCAG appear in the literature, including WCAG 1.0/1.1 [59, 97] and WCAG 2.0/2.1 [67, 83, 88]. WCAG 2.0 and 2.1 apply to a broader range of both established and emerging web content technologies, including JavaScript, Flash, XML, SVG, SMIL, CSS, and PDF [113]. The guidelines in

WCAG 2.0 and 2.1 are structured to be clear, straightforward to implement, and assessable through human evaluation, as well as various automated accessibility checking tools. In contrast, WCAG 1.0, published in May 1999, lacks adaptability to the evolving features of modern web content and technologies. Certain checkpoints from WCAG 1.0 were removed in subsequent versions due to obsolescence, making WCAG 2.0 and 2.1 more suitable for current web accessibility standards. Literature reported several violations of WCAG guidelines in the social media platforms, such as improper labeling of search fields [77], inadequate instructions [60], lack of feedback [83], inefficient use of emojis and hashtags [95], lack of audio feedback [72], reliance on external assistance [72], and inaccurate automatic descriptions [91].

Web Accessibility Initiative. WAI-ARIA is a set of technical specifications focused on making digital content accessible to assistive technologies [114, 115]. These guidelines involve a vocabulary and techniques for integrating semantic information to the HTML elements of the digital content to enable assistive tools to interpret the content correctly [60]. Fuglerud et al. [60] conducted a comprehensive analysis of the experiences of BVI users on social media platforms, assessing their conformance to WAI guidelines. Their research highlighted significant accessibility barriers, particularly in areas such as CAPTCHAs, dynamic web content, and user-generated content, such as images lacking alternative text descriptions.

Authoring Tool Accessibility Guidelines. ATAG is a set of standards that are designed to make authoring tools such as code editors, content management systems, and website builders more accessible to people with disabilities [116]. These guidelines provide guidance for the developers to create tools that conform to WCAG [99]. Sacramento and Ferreira [99] analyzed the accessibility of Facebook, Twitter, Instagram, and WhatsApp using ATAG guidelines. The authors reported a lack of accessible practices,

difficulty discovering accessibility features, complexity of writing descriptions, and lack of context in auto-generated descriptions.

Communicability Evaluation Method. CEM is based on Semiotic Engineering theory and is used to evaluate the effectiveness of a user interface to guarantee that the designers’ objective is communicated to the user [71, 117]. These rules consider the interactive system as a communicative act and examine the user’s interaction with the system. Any breakdowns in the interaction are classified using established criteria and matched to HCI design standards. These guidelines help developers find areas for improvement. Oliveira et al. [71] evaluated the communicability of elderly users’ interaction with the WhatsApp application and identified the communication problems experienced by these users, focusing on how aging impacts their interaction with the app’s interface. The authors reported that users faced difficulty in finding icons, issues with memory and learning, unfamiliar icons and symbols, and required assistance with the tasks.

Twitter’s Guide. These are guidelines established by Twitter to make its content accessible to individuals with impairments [79]. Twitter provides its users with several instructions to make their content accessible to people of varying abilities, such as adding alternative text to photos and sharing caption files with videos for automatic caption generation. Furthermore, Twitter gives guidelines for customizing the accessibility settings based on user preferences, such as display color options, dark/dim modes, and high-contrast modes. Gleason et al. [79] presented an approach for generating alternative text descriptions for images shared on social media using Twitter’s guide. The authors reported several violations of the guidelines, including difficulty locating misinformation warnings, inconsistent display of labels, screen reader incompatibility, lack of audio cues for visual warnings, and limited context for warnings.

Findings. Figure 3 showcases the accessibility guidelines studied in the literature for BVI users. Most studies in the selected publication pool referenced WCAG 2.0/2.1 guidelines, with $n = 15$ studies utilizing this standard. This was followed by WCAG 1.0/1.1, cited in $n = 5$ studies. Other accessibility guidelines, including WAI-ARIA, ATAG, MAC, and Twitter’s Accessibility Guide, were each referenced by $n = 1$ study, indicating limited engagement with these frameworks. Notably, $n = 32$ studies did not specify any accessibility guidelines. These findings underscore a significant gap in standardized guideline adherence across a substantial portion of the literature.

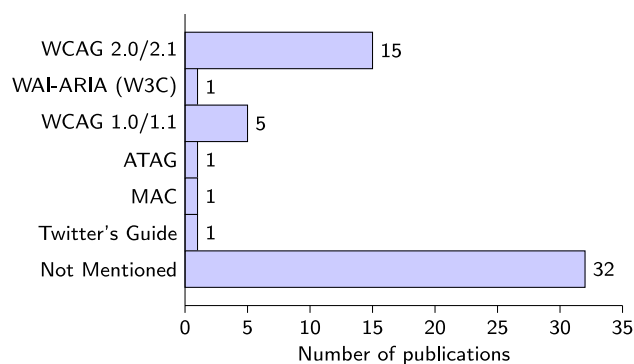


Fig. 3 Accessibility guidelines studied in literature for BVI users on social media platforms

3.3 RQ3: Which accessibility features are most frequently requested by BVI users according to the literature?

Analysis. To answer RQ3, we carefully analyzed each publication to identify accessibility features requested by BVI users. These features were systematically cataloged, and their frequency of occurrence was documented. Additionally, we classified the features based on the degree of consensus among the authors, providing a structured assessment of their relevance and acceptance within the literature.

Results. Tables 4 and 5 show the accessibility feature requests mentioned in the literature to improve the social media experience for BVI users, including their description and the number of studies that include these requests. Navigation emerged as a primary focus, with multiple studies calling for features such as “Simplified Navigation” [59, 60, 66, 93] and “Consistent Navigation & Layout” [60]. Further requests included “Navigation for Video Controls” [68], “Dynamic Content Navigation” [85, 94], and “Voice Navigation and Commands” [76], which highlight the navigation barriers BVI users encounter, as noted in RQ1. Alternative text (ALT text) was frequently requested due to its importance for screen readers in interpreting visual content. Studies recommended various improvements, including “Improved Alternative Text” [61, 83, 96], “Accurate and Descriptive ALT Text” [65–67, 70, 79, 88, 90, 92, 99], “ALT Text/Caption for Multimedia Content” [64, 69, 85], “Alternative Text for Icons and Buttons” [61], and “User-Generated ALT Text” [97, 107, 118]. These requests emphasize the need for reliable and descriptive ALT text to enhance screen reader functionality. Similarly, we observed several feature requests for “Improved Screen Reader Support” given BVI users’ dependency on screen readers to obtain information [80, 91, 104, 106, 108].

The review also indicated significant interest in content customization for BVI users, who benefit from personalized digital elements tailored to their needs. Feature requests

Table 4 Accessibility features requested by the users for improving social media platforms

No.	Requested feature	Description	Study ID	Count
1	Clear labeling of buttons and links	Ensuring all interactive elements, like "follow" buttons, are clearly labeled for screen readers	PS1	1
2	Customizable interface elements	Users should have the option to hide non-essential content and customize their layout for easier navigation	PS1, PS46	2
3	Automatic notifications for updates	Users request that dynamic updates, such as new posts/tweets, be automatically announced by screen readers	PS1	1
4	Simplified navigation	Easier ways to skip between posts without having to read everything in sequence	PS1, PS2, PS13, PS20	4
5	Consistent navigation and layout	Visually impaired users express a need for stable, consistent interfaces so that they do not have to relearn navigation every time the layout changes	PS2	1
6	Integrated accessibility help and tutorials	Users request more accessible documentation and training for using assistive technologies on social media	PS2, PS3	2
7	Accessibility-optimized mobile interface settings	BVI users often prefer simplified mobile interfaces due to improved accessibility over standard web interfaces	PS3, PS6	2
8	Improved alternative text	Users request consistent implementation of alternative text for all images, icons, and buttons to improve accessibility with screen readers	PS3, PS14, PS24	3
9	Search assistance and guidance	BVI users frequently request more explicit guidance on appropriate search terms and methods for conducting searches on social media platforms	PS4, PS52	2
10	Simplified logout option	Users request clearer, more accessible navigation for logging out	PS5	1
11	Keyboard shortcuts	BVI users request improved keyboard shortcuts for navigating social media platforms	PS6, PS8, PS17	3
12	Speech-to-text (STT) Feature	Requested for easier navigation through social media platforms, allowing users to input text (e.g., username and password) by speaking instead of typing	PS7	1
13	Alt text/captions for multimedia content	BVI users requested alternative text for both images and videos to understand the visual content shared on social platforms	PS8, PS10, PS32	3
14	Event-based vibe awareness	BVI users request systems that help them understand situational events through audio feedback, based on real-time updates from social media about their surrounding environment	PS9	1
15	Automated captioning for images	Users requested the ability to use automated captioning tools to describe images when no alt text is available, improving accessibility	PS10, PS27, PS29, PS32	4
16	Accurate and descriptive alt text	BVI users frequently requested more meaningful alternative text to describe photos	PS11, PS20, PS23, PS29, PS34, PS37, PS38, PS47, PS48	9
17	Photo caption reminders for sighted users	Blind users suggested that platforms could prompt sighted users to provide captions when uploading images	PS11, PS36	2
18	Audio description for images or video	Social media platforms include audio descriptions or alternative text for images to make social media content more accessible	PS13, PS19, PS21, PS28, PS38, PS39, PS42, PS45, PS52	9

included “Font Size Adjustment” [78, 108], “Enhanced Zoom for UI Elements” [103], “Customizable Augmented Reality Prompts” [103], “Playback Customization Options”

[105], “Customizable Interface Elements” [59, 84], and “Larger Icons and Text Labels” [71]. These requests reflect BVI users’ need for personalization options to optimize

Table 5 Accessibility features requested by the users for improving social media platforms

No.	Requested feature	Description	Study ID	Count
19	User-generated audio descriptions	Social media platforms allow users to record their own audio descriptions when posting images	PS15, PS22	2
20	Improved screen reader support	Consistent and descriptive text for images so that screen readers can provide better descriptions	PS15, PS26, PS42, PS49, PS54	5
21	Facial recognition and emotion detection	Blind users requested features that would allow the system to detect and describe people's identities and emotions within photos	PS16	1
22	Font size adjustment	Users requested that Weibo include the ability to resize text to 200% without the need for assistive technology	PS17, PS49	2
23	Enhanced zoom for UI elements	Low-vision users have requested zoom functionality that applies not only to photos but also to operational buttons, filter thumbnails, and other interface elements	PS18	1
24	Customizable augmented reality prompts	Low vision users requested better control of augmented reality (AR) features, such as the ability to pause prompts on Snapchat to help them manage the interface	PS18	1
25	Customization of playback features	Blind users requested features that allow them to control video playback speed or access additional descriptions	PS19	1
25	Optical character recognition (OCR) for text-based screenshots	BVI users request the ability to read screenshots that contain text	PS22, PS27	2
25	Edit image descriptions	BVI users want the option to add or edit image descriptions	PS24, PS35, PS36	3
25	Accessible video-editing tools	BVI vloggers request video-editing tools that provide audio feedback when certain tasks are completed	PS25	1
25	Navigation for video controls	Participants requested better labeling and easier navigation for controls like play, pause, volume, and full screen on social media video player	PS25	1
26	Larger icons and text labels	BVI users have requested that icons be made larger and paired with text labels to enhance their recognition, particularly for those with low vision	PS40	1
27	Audio feedback	Blind users have requested more efficient audio feedback when interacting with menu options, labels or performing complex tasks	PS40, PS41, PS50	3
28	Voice navigation and commands	BVI users frequently request improved voice navigation systems and voice commands to make it easier to perform actions like sending messages or posting content without relying heavily on visual cues	PS53	1

their interaction with social media content. Further requests addressed clear labeling and accessibility training. For example, Buzzi et al. [59] recommended “Clear Labeling of Buttons and Links” and “Automatic Notifications for Updates”. Other studies highlighted the importance of training content creators to make posts accessible [60, 61], providing clear navigation instructions [77, 95], and designing accessibility-optimized mobile interface settings [61, 63]. Studies also emphasized the inclusion of “Keyboard Shortcuts” to streamline social media use for BVI users [63, 64, 78].

Lastly, enhanced media accessibility was a recurring feature request, with studies suggesting “Automated Captioning for Images” [69, 85, 87, 88], “Photo Caption Reminders for Sighted Users” [65, 89], “Audio Descriptions for Images and Video” [74, 82, 90, 91, 93, 95, 101, 105, 109], “User-Generated Audio Descriptions” [86, 104], “Edit Image Descriptions” [83, 89, 98], and “Audio Feedback” [71, 72, 75]. These features target significant

gaps in media accessibility, supporting BVI users by providing alternative modes for interacting with visual content on social media platforms.

Findings. The literature review identified a total of 28 distinct accessibility feature requests across the selected studies, all aimed at enhancing social media accessibility for BVI users. The most frequently cited features were “Accurate and Descriptive ALT Text” ($n = 9$) and “Audio Description for Images or Video” ($n = 9$). Following this, “Improved Screen Reader Support” was requested by $n = 5$ studies, while both “Automated Captioning for Images” and “Simplified Navigation” were highlighted in $n = 4$ studies each. These findings reveal a strong focus within the literature on enhancing interpretive features that enable BVI users to engage with visual and multimedia content more effectively, alongside improved navigational support to streamline platform usability.

3.4 RQ4: Which social media platforms have been studied in the literature for BVI users?

Analysis. To address RQ4, we conducted a systematic analysis of the selected studies to identify the social media platforms examined for accessibility in relation to BVI users. Subsequently, to address the sub-questions, we systematically categorized platform-specific accessibility challenges reported in each study. This process included an examination of existing accessibility features on each platform and a detailed analysis of accessibility issues encountered by BVI users across different social media platforms.

Results. Our literature review identified several social media platforms studied for accessibility evaluation concerning BVI users. The findings indicate that researchers frequently focus on popular social media platforms with larger user bases, as these are likely to yield insights with broader applicability. Results showed that 30 out of 55 studies analyzed multiple social media platforms rather than a single platform to enhance the generalizability of their findings. For example, Dinis et al. [88] examined Facebook, Instagram, Twitter, and YouTube, whereas Gupta et al. [84] focused on Reddit, Quora, and Stack Overflow. Morris et al. [119] explored accessibility across five platforms, including YouTube, WhatsApp, LinkedIn, Instagram, and Skype. Similarly, Zhang et al. [95] analyzed Twitter, YouTube, and Instagram. Conversely, some studies concentrated on individual platforms to provide a focused analysis of specific accessibility challenges. For instance, Twitter was the sole

platform examined by authors of [79, 83, 86, 87, 89, 101, 109, 118], while Facebook was the focus in [62, 63, 69, 77, 97]. Additional studies analyzed other singular platforms, with dos Santos Marques et al. [104] focusing on Instagram and YouTube being analyzed by authors in [68, 81, 105]. TikTok was studied by Seo and Jung [80], and WhatsApp was the subject of studies in [71, 82]. These results highlight the commitment of the research community to understand accessibility on both a broad and specific scale within social media platforms for BVI users.

Findings. Table 6 provides an overview of social media platforms studied in the literature regarding accessibility for BVI users. Our analysis shows that "Facebook" is the most frequently examined platform, analyzed in $n = 28$ studies, reflecting the prominence of Facebook among visually impaired users as noted in [41]. This aligns with findings from multiple studies indicating that Facebook has been widely adopted by individuals with visual impairments [60, 120–123]. The second and third most studied platforms are "Instagram" and "YouTube", analyzed by $n = 15$ and $n = 13$ studies, respectively. Following these, "TikTok" and "LinkedIn" are each examined in $n = 4$ studies, while "Skype" is explored in $n = 3$ studies.

Platforms with minimal coverage include "Reddit", "Windows Manager", "Weibo", "Snapchat", "Twitch", "Quora", "StackOverflow", and "Telegram", each of these platforms are examined in only $n = 1$ study. These findings indicate a research focus predominantly on widely adopted social media platforms. It can be observed that limited attention

Table 6 Social media platforms analyzed for accessibility features for BVI users

No.	Social media platform	Study ID	Count
1	Facebook	PS2, PS3, PS4, PS5, PS6, PS8, PS9, PS11, PS12, PS13, PS16, PS18, PS20, PS23, PS29, PS32, PS33, PS34, PS35, PS37, PS38, PS41, PS44, PS45, PS49, PS50, PS51, PS53	28
2	X (Twitter)	PS1, PS2, PS8, PS9, PS10, PS11, PS12, PS14, PS20, PS22, PS23, PS24, PS27, PS28, PS29, PS30, PS35, PS36, PS37, PS39, PS44, PS47, PS51, PS52	25
3	Instagram	PS11, PS12, PS15, PS18, PS23, PS29, PS33, PS35, PS37, PS38, PS42, PS43, PS44, PS52, PS53	15
4	Youtube	PS2, PS3, PS19, PS25, PS29, PS31, PS33, PS38, PS43, PS45, PS50, PS52, PS53	13
5	Whatsapp	PS13, PS21, PS35, PS37, PS38, PS40, PS42, PS43, PS49, PS53	9
6	Tiktok	PS45, PS50, PS53, PS54	4
7	LinkedIn	PS8, PS11, PS43, PS53, PS54	4
8	Skype	PS2, PS3, PS43	3
9	Reddit	PS46, PS51	2
10	Windows Messenger	PS2	1
11	Weibo	PS17	1
12	Snapchat	PS18	1
13	Twitch	PS33	1
14	Quora	PS46	1
15	Stackoverflow	PS46	1
15	Telegram	PS53	1
17	Custom built	PS7	1

is given to platforms with smaller user bases, which may overlook accessibility issues that BVI users experience on less commonly used platforms.

3.4.1 RQ4_a: What accessibility features are present in social media platforms for BVI users?

Results. Our analysis identified several accessibility features across various social media platforms that support BVI users listed in Table 7. Facebook offers multiple accessibility features, including a mobile-friendly interface and VoiceOver mode, enabling BVI users to receive instructions and perform tasks independently. Additionally, Facebook supports screen readers, provides event summaries, and includes audio alerts and automated ALT text generation for images and videos [67, 106]. Facebook also includes misinformation labels for content accessibility. YouTube offers accessible video controls via assistive technology (AT), captions and subtitles [105], screen reader support [68, 105], magnification tools [68], and audio descriptions for video content [81], as well as misinformation labels. Skype provides voice and text chat options.

Twitter includes basic accessibility features, such as accessible form fields, event summarization, audio alerts, and third-party clients (EasyChirp, Chicken Nugget, TheQube), along with ALT text for images, alternative text for GIFs [101], and Voice Tweets [74]. LinkedIn incorporates visual feedback for errors, enhancing accessibility. WhatsApp supports both text- and audio-based interactions, while Instagram provides screen reader support, filters, and brightness adjustments [103], as well as AI-based image descriptions [67, 106]. Weibo features font size adjustments and keyboard navigation options. Snapchat offers quick photo capture through its camera [103],

and TikTok has VoiceOver compatibility for basic actions, supporting essential accessibility needs for BVI users.

Findings. The results reveal that accessibility features for BVI users are unevenly distributed across social media platforms. Some platforms offer extensive support for BVI users, while others provide only basic functionality. Platforms like Facebook and YouTube exhibit more comprehensive accessibility implementations as they integrate multiple features such as screen reader support, automated ALT text, audio descriptions, and misinformation labels. This suggests that these platforms demonstrate a greater commitment to accessibility for BVI users. Conversely, platforms like TikTok, Snapchat, and LinkedIn offer limited accessibility features, typically restricted to basic actions and visual feedback.

Additionally, some platforms rely on third-party applications (e.g., Twitter’s EasyChirp and TheQube clients) to address accessibility gaps, which highlights the potential limitation in the native support by the platforms for BVI users. There is also a noticeable emphasis on multimedia accessibility features (e.g., ALT text, audio descriptions, captions), indicating that BVI accessibility efforts are primarily focused on enhancing visual content interpretation. However, platform support for customized navigation and user-specific adjustments, such as font resizing and interface customization, remains inconsistent. This inconsistency may affect the inclusion of social media experiences for BVI users, particularly on platforms with fewer integrated accessibility features.

3.4.2 RQ4_b: What are the accessibility challenges associated with each social media platform?

Results. The analysis of accessibility issues across various social media platforms reveals a pattern of challenges

Table 7 List of accessibility features present in social media platforms as reported in literature

No.	Social media platform	Accessibility features
1	Facebook	Mobile-friendly interface, VoiceOver mode, keyboard shortcuts, Screen Reader Support, Event Summarization, and Audio Alerts, Automatic Alt-Text (AAT) (PS23, PS26), Misinformation Labels
2	YouTube	Video controls using AT, captions and subtitles (P19), screen reader support (P19, PS25), magnification tools support (PS25), audio descriptions for video content (PS31), Misinformation Labels
3	Skype	voice and text chat
4	Twitter	Basic accessibility features for form field, event summarization and audio alerts, twitter third-party clients (Easy-Chirp, Chicken Nugget, TheQube), alt text for images, alternative text for GIFs (PS28), voice tweets (PS45)
5	LinkedIn	Visual feedback for errors
6	Whatsapp	Text and audio-based interaction
7	Instagram	Screen reader support, filter and brightness adjustment (P18), AI-based image descriptions (P23, PS26)
8	Weibo	Font size adjustment, keyboard navigation
9	Snapchat	Camera for quick functional photos (P18)
10	Tiktok	VoiceOver compatibility for basic actions

that consistently hinder usability for BVI users. Facebook emerged as the platform with the highest reported accessibility issues. Babu and Singh [77] found that BVI users struggled with locating the correct search fields, understanding search results, and navigating due to inadequate instructions and insufficient feedback. Similarly, Ramayah et al. [62] observed that BVI participants using JAWS experienced lengthy registration processes on Facebook, often exceeding fifteen minutes due to difficulties detecting error messages. Logins, although smoother, required multiple shortcut keys, ultimately resolved with the Insert + F5 command. Navigation through updates took over 15 min due to the multi-column layout, and logging out posed difficulties as the logout button disappeared when images were disabled. In a related study, Wu and Adamic [63] reported that while BVI users are active on Facebook, producing status updates more frequently than photo uploads, they encounter significant accessibility issues related to navigating photo content, screen reader support, and engaging with interactive features such as likes and comments. Additional issues included inconsistent alternative text [62, 64], inaccessible icons and buttons [62], and challenges with dynamic content [77]. Complicated privacy settings [97] and unclear fact-checker identification [64] further added to difficulties in real-time event tracking and content comprehension on Facebook.

YouTube presents accessibility challenges primarily in navigating video content, as noted by Ramayah et al. [68]. Visual content descriptions are often inadequate [88], and there are limitations in accessing analytical tools, such as graphs [81]. Skype exhibits similar issues, with difficulties in accessing visual elements, while LinkedIn has limitations in error feedback and field labeling, which can disrupt workflow for BVI users. Loureiro et al. [64] identified accessibility barriers on LinkedIn, particularly when navigating profile pages and encountering inaccessible error messages and field descriptions. Arora et al. [76] also pointed out the inaccessibility of PDFs on LinkedIn, which restricts full functionality for BVI users.

Twitter also shows widespread accessibility concerns, particularly around navigation and media interaction [59]. Embedded content frequently lacks descriptions, creating challenges in tagging due to inconsistent or missing ALT text [83, 107]. The platform's dynamic content, including GIFs and videos [87], further complicates accessibility as ALT text for GIFs is rarely adopted and often disabled by default, creating critical gaps for BVI users. Morris et al. [85] emphasized that Twitter's updates can introduce new accessibility barriers for BVI users.

On Instagram, a study by Gupta et al. [91] revealed that 80% of posts violated multiple WCAG 2.1 Level-A criteria. Dos Santos Marques et al. [104] found that Instagram's reliance on screen readers for text descriptions limited BVI

users' ability to understand visual content due to a lack of audio descriptions. Similarly, Lee and Ashok [99] highlighted that Instagram's usability is hindered by the absence of comprehensive visual descriptions, making it challenging for BVI users.

Weibo and Snapchat also exhibit accessibility gaps. Liu and Chen [78] identified 162 accessibility issues on Weibo's Hot Topic page and 103 on personal homepage sections, including missing ALT text, poor color contrast, and unlabeled elements. BVI users faced significant challenges with CAPTCHA during login, and navigation difficulties arose from missing ARIA tags and illogical layouts. On Snapchat, Bennett et al. [103] reported that everyday actions such as zooming often triggered unintended functions, and the ephemeral nature of content limited the effectiveness of assistive tools for tasks like selfie-taking.

According to Oliveira et al. [71], BVI users on WhatsApp faced challenges with communicability, struggling to find contacts, locate icons, and distinguish visual elements. Tasks such as changing profile pictures and sending media posed additional difficulties. Shared images on WhatsApp often lack descriptions, making multimedia navigation complex and limiting the platform's support for BVI-friendly content [76, 82, 90, 93, 98, 99, 108, 119].

Finally, TikTok presents accessibility barriers in the placement of misinformation labels [74] and screen reader compatibility issues [75], limiting effective engagement for BVI users on the platform.

Findings. Table 8 summarizes the limitations of each social media platform as documented in the literature. The findings indicate that accessibility limitations for BVI users on social media platforms primarily stem from inadequate media descriptions, inconsistent navigational support, and limited adaptability of dynamic and visual content. Facebook, Twitter, and Instagram, among the most frequently used platforms, display the broadest range of accessibility challenges, particularly concerning inconsistent or hidden ALT text and limited support for dynamic media formats like GIFs and videos. This trend suggests a gap in platforms' attention to media accessibility for BVI users, highlighting a need for comprehensive alternative text solutions and enhanced tagging practices to improve user interaction.

Moreover, a lack of uniform feedback for task failures and obscure labeling practices observed on platforms such as LinkedIn and Facebook compounds accessibility challenges. Platforms like TikTok and Snapchat, which feature highly visual or time-limited content, lack effective tools for BVI users, with Snapchat's disappearing content and TikTok's inconsistent compatibility with screen readers. Additionally, many platforms have a low adoption rate of essential accessibility features, such as ALT text by default, which is crucial for BVI users to navigate visual and multimedia elements independently. Overall, these findings highlight a gap

Table 8 Accessibility issues corresponding to each social media platform as reported in the literature

No.	Social media platform	Accessibility issues
1	Facebook	Complex navigation, inaccessible icons, and buttons, issues with dynamic content, inconsistent alternative text, improper labeling of form fields, insufficient feedback after failed tasks, image and video accessibility, insufficient real-time event tracking, complex privacy settings, lack of rich descriptions, lack of clear fact-checker identification (PS50)
2	Youtube	Difficulty navigating video contents, inadequate descriptions of visual content (P19), difficulty navigating video playback (P19, difficulty accessing analytical tools like graphs and statistics (PS39)
3	Skype	Difficulties to access visual elements
4	LinkedIn	Error feedback and field labeling
5	Twitter	Navigation and media issues, lack of geotagged event updates, embedded visual content without descriptions, challenges in tagging, inconsistent use of alt text (P22), lack of alt text (P22, P24), alt-text disabled by default (PS24, PS51), challenges with dynamic content (GIFs, Videos, images) (PS27), low adoption of alt-text for GIFs
6	Instagram	Lack of text alternatives for visual content, difficulty managing filters and zooming (P18), hidden alt text field (PS37, PS38)
7	Weibo	Lack of visible focus for keyboard navigation, inaccessible CAPTCHA
8	Snapchat	Issues with time-limited snaps (P18)
9	Instagram	Lower accessibility for visual content (P20), trust in AI descriptions (PS23), Limited Accessibility of Stories (PS44)
10	Whatsapp	Lack of descriptions for shared images (P21), difficulty in navigating and recognizing icons (PS40), limited support for multimedia content (PS49)
11	Tiktok	Obscure placement of misinformation labels (PS50), incompatible features with screen readers (PS54)

in dedicated support for BVI accessibility needs on social media, underscoring the need for universal design adaptations that prioritize screen reader compatibility, descriptive content, and clear user feedback across platforms.

3.5 RQ5: What are the limitations of current assistive tools in ensuring full accessibility for BVI users on social media?

Results. Our literature review revealed several limitations of the assistive tools for BVI users on social media platforms. For example, screen readers are commonly used but exhibit considerable accessibility challenges across social media environments. Buzzi et al. [59] noted that screen readers read content linearly, making it difficult for users to navigate in a non-linear manner, especially when multiple features are embedded on the same page. Additionally, the authors reported limitations with AJAX-based updates, which screen readers fail to communicate effectively. A study by dos Santos Marques [104] revealed that the synthetic voice of screen readers made it more complicated for BVI users to comprehend images fully. The study by O'Hara et al. [74] highlighted that screen readers are unable to effectively recognize or convey warnings associated with misinformation labels, leaving users with inadequate cues to verify information. Furthermore, Gleason et al. [87] noted that screen readers struggle to interpret visual elements, such as graphs, tables, or embedded images, which hinders BVI users' access to critical data on social media platforms. The literature also mentions that the poor integration of screen

readers, such as VoiceOver, JAWS, and NVDA, in social media platforms introduces issues with dynamic content, including multimedia elements like images and videos [64, 89, 90, 94, 103, 105]. In addition, Chiarella et al. [118] emphasized that inadequate or missing ALT text for images severely limits usability, leaving screen readers unable to provide context for image-based content.

According to Martiniello et al. [61], refreshable Braille displays are not widely used due to their complexity, especially in rapidly changing digital content, despite their benefits for tactile access. Similarly, Ghatak et al. [94] reported that speech recognition tools require users to adapt to specific commands, making them less effective until proficiency is achieved. Loureiro et al. [64] reported that keyboard navigation is inconsistently supported on social media platforms. Other technologies also show platform-specific limitations. Wearable sensors, for example, often lack comprehensive situational awareness, especially when not integrated with real-time social media data, as observed by Joseph et al. [100]. Optical Character Recognition (OCR) technology, while useful for generating alternative text (ALT text), often fails with complex images, such as memes, which are popular on social media, as documented by Voykinska et al. [65]. The issue persisted, as further documented in the study by Gleason et al. [87]. Further challenges arise with screen magnifiers, as the authors of [103, 124] found that magnifiers often conflict with app-based gestures, resulting in accidental actions, such as unintended likes, during navigation.

Our analysis also revealed that advanced tools, such as Microsoft Seeing AI, generate only basic descriptions, which lack the contextual detail required for a complete understanding of complex images [86, 101]. Notably, the Augmentative and Alternative Communication (AAC) devices are also limited in their ability to allow BVI users to engage effectively with public social media content due to unique interaction patterns [87]. Gleason et al. [83] reviewed bots for automated ALT text generation and found that the descriptions provided by these bots are often irrelevant or of low quality, thereby reducing the overall effectiveness of this technology.

Findings. The limitations of assistive technologies for BVI users on social media platforms are summarized in Table 9. The literature review suggests that the current assistive technologies provide limited and often inconsistent support for BVI users on social media platforms. We found substantial accessibility issues in handling dynamic, multimedia-rich environments. Although screen readers are central to accessibility to the BVI, we found that most of the literature reported accessibility issues with screen readers. These assistive tools are limited by linear reading constraints, insufficient feedback for real-time updates, and the inability to interpret complex visual data such as images and graphs. This highlights the need for more adaptive screen reader solutions that can effectively navigate the non-linear content structures commonly found on social media. Furthermore, tools like OCR and bots for ALT text generation also fall short, as their descriptive capabilities are often simplistic and fail to convey details essential for accurate comprehension. Notably, technologies such as refreshable Braille displays and wearable sensors are incompatible with social media, suggesting a gap in real-time data integration needed for these devices to function effectively.

Moreover, the results highlight that the lack of consistent keyboard navigation and conflicts with magnification tools complicate interaction, particularly on mobile platforms, where gesture-based commands are more common. These limitations highlight the need for advancements in automated descriptive tools, real-time content synchronization, and interface adaptation to support the participation of BVI users in the rapidly evolving nature of social media platforms.

3.6 RQ6: How have the number of studies on social media accessibility for BVI users evolved over time?

Analysis. To address RQ6, we systematically cataloged the selected studies by year of publication. This analysis aims to uncover temporal trends. The findings provide insights

into the progression and key focus areas of this research over time.

Results. Our temporal analysis reflects shifts in the research on social media accessibility. We found that the studies primarily investigated fundamental accessibility barriers on mainstream social media platforms such as Twitter and Facebook in the early years, from 2011 to 2015. The volume of research during this period was relatively low, with one publication in 2011 [59]. Furthermore, the researchers focused on usability and navigation challenges, as well as the overall accessibility of these platforms [59, 61, 62]. During this period, some research efforts focused on the development of alternative social media platforms designed explicitly for BVI users, such as SocialWeb [94]. There was also an effort to understand how well accessibility standards matched the actual experiences of blind users [77].

From 2016 to 2019, social media accessibility research broadened its scope beyond navigation to encompass content accessibility. A significant portion of this research investigated how BVI users interact with visual media, including images, GIFs, and videos [65, 66, 85, 97, 104]. Researchers assessed the significance of image descriptions provided by users and assistive technology [83, 86, 97]. Following this, the introduction of automated alt-text for visual content on social media platforms prompted investigations into their usability and accuracy [97]. In addition, the researchers integrated social experiences in their studies, such as community engagement and the role of social media in fostering digital inclusion [67, 82, 105]. Overall, research increased moderately during this period, reflecting growing academic interest in accessibility challenges specific to social media platforms.

From 2020 onward, the BVI users actively started participating on social media platforms, shifting the focus of research to the challenges faced by blind content creators, the accessibility of content authoring tools, and the impact of misinformation warnings [68, 75, 81, 89]. A primary research focus during this period remained the platform-specific accessibility issues, with research investigating YouTube, WhatsApp, and other social media platforms for accessibility issues [69, 71, 87, 91]. The role of social media in boosting social connections for visually impaired users was another key area of research [108]. The research output remained steady from 2020 to 2022. However, a significant surge was observed in 2023, which marked the highest number of publications in this area [73, 79, 92, 107, 119]. We observed a sustained academic and technological interest in improving digital accessibility for BVI users with new studies emerging in 2024 [76, 80, 95].

Findings. Figure 4 illustrates research trends on social media accessibility for BVI users. It can be observed that the number of studies on social media accessibility for BVI users has increased significantly over time. Initial research activity was limited, with only one study in 2011. The early

Table 9 Challenges and limitations of assistive technologies for BVI users on social media

Assistive tool	Limitation	Description	Study ID
Screen reader	Linear navigation constraint	Screen readers linearly read content, making it challenging to navigate in a non-linear manner and can not access all the features	PS1, PS35, PS46, PS53
	Ineffective warning recognition	Inability to recognize and convey warnings effectively when misinformation labels are not interactive, leaving BVI users without adequate support in truth discernment	PS50
	Inability to interpret visual data	Screen readers can not interpret visual elements such as graphs, tables, or text-embedded images, making it difficult for BVI users to access statistical or graphical data	PS25, PS37, PS42
	Ineffective AJAX Updates	AJAX-based updates are not communicated effectively to screen readers, leaving users unaware of changes	PS1, PS3, PS4, PS6, PS26, PS32
	Form accessibility issues	Users experience difficulties completing forms, such as detecting labels and error messages, due to poor screen reader integration	PS1
	Navigation challenges	Difficult to navigate due to missing labels and illogical components and layout	PS17, PS49
	Reliance on multiple shortcuts	Navigation with screen readers requires multiple shortcuts to compensate for missing or poorly labeled elements	PS5, PS13, PS54
	Dynamic content accessibility issues	Screen readers struggle with dynamic content such as images, videos, and modal windows. This makes it hard for users to interact effectively with multimedia elements on social media platforms	PS7, PS8, PS18, PS19, PS20, PS36, PS38, PS39, PS44, PS51
	Image-based content limitations	Screen readers like VoiceOver, JAWS, and NVDA face limitations when dealing with image-based contents that lack alternative text	PS10, PS11, PS14, PS15, PS16, PS17, PS26, PS30, PS34, PS35, PS36, PS38, PS41, PS44, PS45, PS47, PS52
	Limited Adoption and Mastery	Limited use and insufficient mastery of this technology among users, making it difficult to navigate rapidly changing or multimedia-heavy platforms	PS3
Speech recognition	User Adaptation Requirement	SR requires users to adapt to the technology and may not be efficient for all tasks until users become proficient	PS7
Keyboard navigation	Limited Keyboard Support	Limited support for keyboard-only navigation creates challenges for users to bypass repetitive content or access specific functionalities	PS8

Table 9 (continued)

Assistive tool	Limitation	Description	Study ID
Wearable sensors	Incomplete Situational Awareness	These devices face limitations in providing comprehensive situational awareness without integration with real-time social media data	PS9
Optical character recognition (OCR)	Limited Interpretation of Complex Visuals	While OCR technology can help generate alt text for photos, it is often insufficient for interpreting more complex visual content like memes or videos	PS11, PS27
	Gesture conflicts	magnification features sometimes conflicted with app-based gestures, causing unintended actions like accidentally liking posts while zooming	P18, PS40
	Unreliable embedded text recognition	Screen magnifiers can access some embedded text based on font size and color contrast, but are unreliable	PS20
Screen magnifiers	Blurring and misalignment issues	Magnifiers often cause blurring or misalignment when trying to read comments or navigate the screen during live streams	PS33
	Slow navigation	Magnifiers slow down navigation by limiting users to viewing small portions of the interface at a time	PS3
Computer vision tool (Microsoft Seeing AI)	Simplistic image descriptions	The alt text generated by computer vision remains simplistic and often lacks the depth needed for an accurate description	PS22, PS28
Augmentative and alternative communication (AAC) Devices	Limited public interaction	Users of AAC tools have different interaction patterns on social media, limiting their ability to effectively engage with broader public content	PS23
Bots	Low-quality descriptions	Bots that automatically generate alternative text often provide irrelevant or low-quality descriptions	PS24

years saw moderate development, with only a few studies ($n = 2$ published in 2012, 2014, 2015, and 2018). We found that the initial research efforts primarily focused on identifying accessibility barriers and usability issues across social media platforms. However, research activity increased from 2019 onward, with a significant surge in publications: $n = 5$ in 2017 and 2019, and a steady $n = 6$ each year from 2020 to 2022. This period marks a transition towards investigating content accessibility, particularly how BVI users interact with visual media [65, 66, 85, 97, 104]. The research focus also expanded to include content creation challenges, misinformation, and platform-specific accessibility issues [75, 81, 89]. The most significant surge in research occurred in 2023, with $n = 9$ studies, reflecting an increased emphasis on inclusive design principles and assistive technologies [73, 79, 92, 107, 119]. The trend continued into 2024, with early publications suggesting sustained interest in enhancing digital accessibility for BVI users [76, 80, 95]. This upward trajectory aligns with a broader global awareness of digital accessibility and inclusion [30, 125, 126]. The findings suggest that the increased research output is likely influenced by technological advancements, policy-driven accessibility initiatives, and a growing recognition of the need for equitable digital experiences.

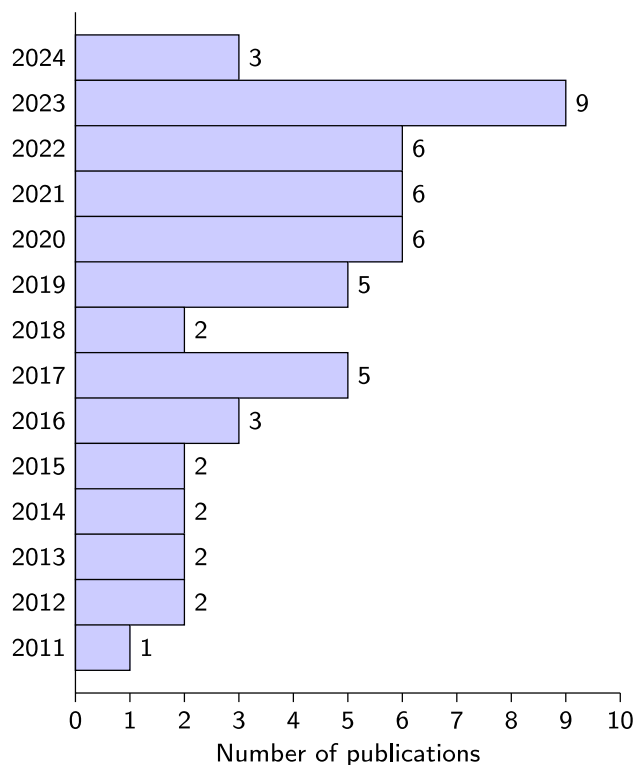


Fig. 4 Year-wise distribution of studies on the accessibility of social media for BVI users

4 Takeaways

Based on the analysis of our RQs, we derive several key takeaways and their implications for future work in accessibility and social media development.

Takeaway 1. Navigation complexity is a significant accessibility issue for BVI users.

Navigation emerged as one of the most challenging aspects of social media use for BVI users, particularly on platforms with complex, multi-column layouts, such as Facebook and LinkedIn. The literature highlighted that the dynamic nature of digital content complicates screen reader navigation and often forces BVI users to rely on keyboard shortcuts or commands to locate essential features. For instance, multi-column formats with frequently updating feeds increase cognitive load and decrease orientation efficiency for users relying on linear navigation tools. We recommend that developers mitigate these complexities through platform designs that incorporate simpler, single-column layouts or navigation paths optimized for explicit screen reader compatibility.

Takeaway 2. Limited Accessibility in Multimedia Content.

Social media includes visual content, particularly videos and images. However, BVI users face significant challenges due to insufficient descriptive support. Although ALT text features are available on various social media platforms such as Facebook and Twitter, these tools are often inconsistently applied or disabled by default, which reduces their effectiveness. Social media platforms such as Instagram and Snapchat offer minimal support for detailed image descriptions or audio descriptions of videos, which leaves BVI users without adequate context. This emphasizes the need for mandatory and comprehensive ALT text policies that support automated, context-rich descriptions for multimedia content for BVI users.

Takeaway 3. Inconsistency in the adoption of ALT text across social media platforms.

We observed variability in the adoption of ALT text on social media platforms. For instance, Twitter has a feature for adding ALT text to the content; however, it does not enforce its implementation, which leads to a lower adoption rate. Furthermore, platforms like YouTube provide captions. However, they lack full descriptive support for BVI users. Consistent application of ALT text and mandatory description policies could create a more uniform and accessible social media experience for BVI users.

Takeaway 4. Limited applicability of screen readers on dynamic content.

Our review revealed that popular screen readers, such as JAWS and NVDA, struggle with AJAX-based updates and dynamic content prevalent on platforms like Twitter,

Instagram, and Facebook. This results in BVI users missing real-time updates or content changes, as screen readers do not adequately communicate these alterations. Additionally, screen readers often fail to interpret multimedia overlays, resulting in frequent interruptions to user engagement. It is recommended to improve the integration of the screen reader to handle dynamic and interactive content types, including live feeds, which would enable BVI users to participate in real-time social media interactions more effectively.

Takeaway 5. Insufficient support for keyboard navigation across social media platforms.

Screen reader users rely heavily on keyboard navigation. However, we found inconsistent application of this accessibility feature across social media platforms. Although social media platforms like Twitter and LinkedIn provide limited shortcuts, TikTok and Instagram offer minimal keyboard navigation options, forcing users to take extra steps to locate the desired content. Keyboard navigation limitations can lead to user fatigue and hinder engagement, especially on platforms that lack clear navigation structures. This can be mitigated by implementing comprehensive keyboard navigation shortcuts and ensuring their consistency across all platform interfaces.

Takeaway 6. Usability of social media platforms by BVI users is reduced by missing or incorrect labels.

Improper labeling for buttons, form fields, and icons poses a significant accessibility issue for BVI users. We found that missing or improperly labeled interface elements, specifically on Facebook and LinkedIn, impede BVI users from using interactive features. We recommend standardizing labeling practices across social media platforms and ensuring that the labeling criteria meet screen reader specifications to enhance clarity and interaction efficiency for BVI users.

Takeaway 7. Privacy and security settings on social media platforms complicate access for BVI users.

Privacy settings are challenging for BVI users due to intricate layouts, a lack of clearly defined fact-checking labels, and insufficient descriptive support. Furthermore, authentication procedures like CAPTCHA further complicate accessibility. Developers should simplify privacy settings and provide a clear guide for navigating the structure. We also recommend that the developers improve safety and engagement for BVI users by ensuring the accessibility and proper labeling of fact-checking features.

Takeaway 8. Social media platforms often lack full support for accessibility features.

We observed substantial variation in accessibility features among social media platforms, where some provide more comprehensive support than others. For instance, Facebook and YouTube offer several accessibility features, such as screen reader support, automated ALT text, and captioning

options. Conversely, platforms like TikTok and Snapchat provide limited accessibility for BVI users. This inconsistency makes it difficult for BVI users to rely on a standardized accessibility experience. A more uniform adoption of accessibility features would enable BVI users to engage across platforms without encountering barriers due to differing feature availability.

Takeaway 9. Assistive technologies face significant challenges when navigating dynamic content.

Assistive technologies such as JAWS, VoiceOver, and NVDA are integral for BVI users. However, these tools struggle to interpret non-linear structures, modal pop-ups, and real-time updates, which are common on social media. Additionally, the need to frequently use complex commands or rely on external keyboard shortcuts creates a challenging experience for users. These limitations can be mitigated by enhancing the integration between social media platforms and assistive technologies. Additionally, developing adaptive assistive tools that respond to real-time content changes, such as live feed updates, would provide a more cohesive user experience.

Takeaway 10. Accessibility of video content is significant for BVI users in this digital age.

Platforms like YouTube, Instagram, and Facebook have introduced captions and audio descriptions. However, the literature review showed that the captions often lack full descriptive support for BVI users, particularly for on-screen graphics. Expanding efforts to provide detailed captions and audio descriptions across social media could enable better multimedia engagement for BVI users.

Takeaway 11. Customization options are not supported in social media platforms.

Customization options, such as zoom controls, color contrast, and font resizing, are not supported across all social media platforms. Our findings show that social media platforms like Instagram [67, 106] and Weibo offer basic adjustments such as filter and brightness adjustments and font size adjustments, respectively. However, other platforms offer little to no customization options, which limits the accessibility for BVI users with varied visual needs. Standardizing these options across platforms would enable users to tailor their experiences according to specific accessibility requirements.

Takeaway 12. Global accessibility standards are needed for consistency.

The variability in accessibility features across platforms, coupled with the geographic concentration of research, underscores the need for universal accessibility standards. A consistent, global standard could guide social media platforms in adopting inclusive design principles, ensuring that accessibility is integrated from the ground up and that BVI users worldwide benefit from equitable digital experiences.

Takeaway 13. There is a need for enhanced application of accessibility standards on social media platforms.

Although several accessibility guidelines, such as the Web Content Accessibility Guidelines (WCAG), provide a foundational, globally recognized standard for digital accessibility, our literature review suggests that social media platforms have an inconsistent and often insufficient application of these guidelines. The unique, dynamic, and multimedia-rich nature of social media platforms requires adaptations of globally recognized standards that address specific platform challenges, such as real-time updates, interactive content, and user-generated media. We advocate for a consistent and widespread adoption of accessibility best practices across social media platforms to foster a more inclusive digital environment. This can be achieved through an industry-specific strategy that leverages existing accessibility standards and provides clear implementation guidelines. Regular assessments of accessibility compliance would further strengthen these efforts.

Takeaway 14. Accessibility research is concentrated on popular social media platforms.

The literature reveals a strong focus on platforms such as Facebook, Twitter, Instagram, YouTube, and WhatsApp regarding accessibility for BVI users. This emphasis, likely due to their large user bases, means that platforms such as TikTok, Skype, Reddit, and LinkedIn remain less studied. The limited exploration of these platforms could leave unique accessibility challenges unaddressed, particularly on visually intensive or discussion-focused platforms like TikTok and Reddit. Broadening research beyond popular platforms is essential to provide a comprehensive understanding of accessibility needs across diverse social media environments.

5 Theoretical and practical implications

This SLR presents challenges in the accessibility of social media platforms for BVI users, with real-world consequences for both theory and practice. Theoretically, our findings challenge current accessibility frameworks by revealing the limitations of AI-driven solutions in assisting users with BVI. While some platforms offer automatic alt-text and voice recognition, these tools remain insufficient for conveying the whole contextual meaning of multimedia content [61, 64, 69, 83, 85, 96, 127, 128]. This is due primarily to algorithmic biases in machine learning models, which are trained on datasets that do not adequately consider diverse accessibility needs [129]. Consequently, theoretical advancements are needed to develop AI models that not only generate descriptive content but also adapt dynamically in response to user interaction and feedback [59, 77, 130, 131]. Furthermore, our study highlights the need for a unified

accessibility taxonomy that addresses the unique challenges presented by real-time content updates, multimodal interactions, and assistive technology compatibility [69, 72, 98, 106, 107, 132–134]. The dynamic nature of social media environments suggests the need for supplementary guidelines that incorporate adaptive and intelligent accessibility solutions [133, 135].

From a practical perspective, our findings suggest a clear need to standardize accessibility features across all social media platforms to ensure a consistent experience for individuals with BVI [136]. Current inconsistencies in screen reader support [80, 91, 104, 106, 108], ALT text [65–67, 70, 79, 88, 90, 92, 99], and keyboard navigation [63, 64, 78] play a key role in hindering usability by BVI users [137, 138]. Developers need to focus on building real-time accessibility adaptations, ideally through AI-powered screen readers that can handle dynamic content without users having to constantly intervene [30, 139]. Additionally, third-party assistive technologies often run into compatibility issues [140–142]. Direct platform support for advanced customization options, such as adjustable font sizes [71, 78, 108], color contrast settings [78], and personalized content filtering [59, 84], can help mitigate compatibility issues. However, to address these issues, policymakers, accessibility researchers, and the tech industry must collaborate to create a robust framework that both enforces accessibility standards and fosters innovation. Moreover, since social media has moved beyond screens and into augmented and virtual reality, future research should explore how these emerging modalities can be optimized for BVI accessibility.

6 Limitations

This study, like any systematic literature review, has inherent limitations. We employed a systematic literature review methodology to identify accessibility challenges faced by BVI users on social media platforms. Although our study is strictly focused on users with visual impairments, it is vital to acknowledge the limitations of our study, which are discussed in what follows.

Data Scope and Selection. Defining the scope and selecting appropriate digital libraries presented initial constraints in conducting a systematic literature review. We selected seven electronic databases to ensure a broad range of relevant studies; however, some pertinent resources may have been excluded. To address this limitation, we employed a series of search queries with domain-specific terms and adopted a snowballing technique to expand our search. We started with a foundational set of search terms. We identified additional phrases and terminologies commonly used in accessibility research, which we iteratively refined to increase the scope of our findings.

Terminology Consistency. Another limitation relates to variability in terminology across studies, which can hinder comprehensiveness in capturing all relevant data. Different studies often employ distinct terms or frameworks to describe accessibility challenges, assistive technologies, or the experiences of users with BVI. To mitigate this, we developed a comprehensive and iterative list of search terms to capture a broader set of studies.

Objectivity and Reviewer Bias. Ensuring objectivity and reducing reviewer bias posed another limitation. Each publication was reviewed by multiple reviewers with expertise in the underlying domain to cross-reference findings and mitigate potential biases. Papers were categorized and reviewed through a multi-step consensus process to capture diverse perspectives and interpretations, reducing the reliance on any single reviewer's judgment. Furthermore, we used a standardized categorization framework to summarize and analyze the data objectively.

Scope of Accessibility Challenges. While this review focuses on BVI users, it does not address other groups with disabilities who may experience distinct accessibility challenges on social media. Additionally, our findings were specific to widely used social media platforms, which may limit the generalizability of results to niche or emerging platforms with different accessibility practices.

Despite these limitations, this study offers a valuable resource for future researchers by highlighting the primary accessibility challenges and limitations faced by BVI users on social media. The insights provided can guide subsequent research in developing targeted accessibility solutions and inform platform designers on critical areas for improvement in creating an inclusive digital environment.

7 Conclusion

This comprehensive systematic review analyzed peer-reviewed scientific publications on the accessibility of social media platforms for BVI users, covering studies

published up to 01/12/2024. The review identified and categorized primary accessibility challenges faced by BVI users, including platform-specific barriers and limitations in assistive technologies. By cataloging these key accessibility issues and highlighting their practical implications, this study provides valuable insights for addressing the needs of BVI users on social media. Our findings serve as a consolidated resource for researchers and developers seeking to enhance accessibility on social media platforms, providing a foundation for informed improvements in platform design and assistive technology integration (Table 10).

In summary, the primary accessibility challenges faced by BVI users on social media platforms are predominantly centered around navigation, usability, and visual content issues. Additionally, Visual Content Issues, particularly the lack of ALT text for images, emerge as a significant concern, hindering BVI users' ability to engage with multimedia content. Other notable challenges include dependency on third-party tools, privacy and security concerns, and accessibility of audio feedback. These findings underscore the urgent need for developers to prioritize robust accessibility features, including improved screen reader support, accurate alternative text (ALT text), and simplified navigation.

The studies we analyzed also suggest a gap in the consistent application of accessibility guidelines, with the WCAG being the most frequently referenced standard, while other frameworks, such as WAI-ARIA and ATAG, receive limited attention. Furthermore, current assistive tools, such as screen readers, OCR, and Braille displays, have limitations to address the dynamic and GUI-rich aspects of social media platforms. Issues such as linear reading constraints, insufficient real-time feedback, and inadequate interpretation of complex visual data highlight the need for more adaptive solutions. Advances in automated descriptive tools, real-time content synchronization, and interface adaptation are crucial for bridging these gaps and ensuring full accessibility for BVI users.

Table 10 List of primary studies (PS) reviewed in the literature

ID	Title	Year	References
PS1	Web 2.0: Twitter and the blind	2011	[59]
PS2	Use of Social Media by People with Visual Impairments: Usage Levels, Attitudes and Barriers	2012	[60]
PS3	Accessibility of Social Media for Students Who Are Blind or Have Low Vision	2012	[61]
PS4	Accessibility and usability of social media: convergence between blind users and design standards	2013	[77]
PS5	Visually Impaired User's Navigation Experiences in Facebook	2013	[62]
PS6	Visually impaired users on an online social network	2014	[63]
PS7	Development of a keyboardless social networking website for visually impaired: SocialWeb	2014	[94]
PS8	Analysis of Web accessibility in social networking services through blind users' Perspective and an accessible prototype	2015	[64]
PS9	Being aware of the world: toward using social media to support the blind with navigation	2015	[100]
PS10	"With most of it being pictures now, I rarely use it": understanding Twitter's evolving Accessibility to blind users	2016	[85]
PS11	How blind people interact with visual content on social networking services	2016	[65]
PS12	A literature survey on older adults' use of social network services and social applications	2016	[102]
PS13	Teenagers with visual impairment and new media: a world without barriers	2017	[93]
PS14	Understanding blind people's experiences with computer-generated captions of social media images	2017	[96]
PS15	Audio description on instagram: evaluating and comparing two ways of describing images for visually impaired	2017	[104]
PS16	Automatic alt-text: computer-generated image descriptions for blind users on a social network service	2017	[97]
PS17	How accessible is weibo for people with visual impairments?	2017	[78]
PS18	How teens with visual impairments take, edit, and share photos on social media	2018	[103]
PS19	Understanding blind or visually impaired people on YouTube through qualitative analysis of videos	2018	[105]
PS20	"Am I missing something? Experiences of using social media by blind and partially sighted users"	2019	[66]
PS21	Communities of practice on WhatsApp: A tool for promoting citizenship among students with visual impairments	2019	[82]
PS22	Twitter A11y: a browser extension to describe images	2019	[86]
PS23	Addressing the accessibility of social media	2019	[67]
PS24	"It's almost like they're trying to hide it": How User-Provided Image Descriptions Have Failed to make Twitter accessible	2019	[83]
PS25	Understanding the community of blind or visually impaired vloggers on YouTube	2020	[68]
PS26	The Social Network: How People with Visual Impairment use Mobile Phones in Kibera, Kenya	2020	[106]
PS27	Twitter A11y: a browser extension to make Twitter images accessible	2020	[87]
PS28	Making GIFs accessible	2020	[101]
PS29	Assessing social media accessibility: the case of the Rock in Rio Lisboa music festival	2020	[88]
PS30	Using alt text to make science Twitter more accessible for people with visual impairments	2020	[118]
PS31	Challenges and opportunities to improve the accessibility of YouTube for people with visual impairments as content creators	2021	[81]
PS32	The daily experiences of Facebook for visually impaired users	2021	[69]
PS33	Exploring the experiences of streamers with visual impairments	2021	[124]
PS34	Accessibility of social media application for blinds	2021	[70]
PS35	Barriers and opportunities to accessible social media content authoring	2021	[98]
PS36	"Honestly i never really thought about adding a description": why highly engaged tweets are inaccessible	2021	[89]
PS37	Authoring accessible media content on social networks	2022	[99]
PS38	Accessibility on social media: exploring congenital blind people's interaction with visual content	2022	[90]
PS39	Impact of out-of-vocabulary words on the Twitter experience of blind users	2022	[109]
PS40	The communicability of the interaction of the elderly user with the WhatsApp Application	2022	[71]
PS41	Enhanced accessibility of Facebook messenger for blind users	2022	[72]
PS42	Access and experiences of arabic native speakers with disabilities on social media during and after the world pandemic	2022	[91]
PS43	Social media actually used by people with visual impairment: a scoping review	2023	[119]
PS44	Digital inclusion: analyzing social media accessibility features for students with visual impairments	2023	[73]
PS45	"I Just Didn't Notice It:" experiences with misinformation warnings on Social Media amongst users who are low vision or blind	2023	[74]
PS46	Enabling customization of discussion forums for blind users	2023	[84]

Table 10 (continued)

ID	Title	Year	References
PS47	Alt-Text with context: improving accessibility for images on Twitter	2023	[79]
PS48	Image caption generation for blind users of social media Websites	2023	[92]
PS49	Enhancing social connectedness: How adults with vision impairment perceive and use social media in Nigeria	2023	[108]
PS50	Designing and conducting usability research on social media misinformation with low vision or Blind users	2023	[75]
PS51	Understanding digital content creation needs of blind and low vision people	2023	[107]
PS52	A framework to improve the accessibility of social media account content	2024	[95]
PS53	Investigating the upward trend of social media and assistive technology usage among persons with visual impairment	2024	[76]
PS54	"Because some sighted people, they don't know what the heck you're talking about:" a study of blind tokers' infra-structuring work to build independence	2024	[80]

8 Appendix

Author Contributions WA, RH, ES, AA in formal analysis, investigation, and writing—original draft. WA, RH, ES, ME, and AA worked in supervision, conceptualization, methodology, writing, reviewing, and editing.

Funding This research received no external funding.

Declarations

Conflict of interest The authors declare that they have no Conflict of interest.

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