Breaking the News Barrier: Towards Understanding News Consumption Practices among BVI Individuals in India

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Abstract

Amidst the shift towards digital news media, the news consumption behavior of the blind and visually impaired (BVI) has undergone significant changes. Despite extensive prior work in HCI and Accessibility literature around digital media accessibility for the BVI community – digital news consumption practices among BVI individuals remain inadequately explored. This study focuses on digital news consumption practices among BVI individuals in India. We conducted semi-structured interviews and contextual inquiry with 17 participants, revealing diverse motivations rooted in social mobility and belongingness. Participants disclosed navigational barriers, such as dynamic advertisements, and consequently relied on volunteer-driven ad-free newspapers as a stopgap. While news source preferences were shaped by interface accessibility, factors like neutrality and coverage played a crucial role too. Our findings highlight the need for a nuanced understanding of BVI users' experiences and inform implications and recommendations for designing accessible digital news platforms.

CCS Concepts

• **Human-centered computing → Human computer interaction (HCI)**; **Empirical studies in HCI**; **Field studies**.

Keywords

News Consumption, Accessibility, Blind and Visually Impaired, Screen Readers, Information Access

1 Introduction

News is an integral part of one's life, facilitating individuals to actively engage and stay informed about relevant civic issues that directly impact them [47]. Recent technological advancements have brought about a shift in news consumption habits, moving away

from traditional news media towards digital platforms such as news websites, mobile applications, news aggregators, and voice assistants. A recent report [8] highlighted the increasing adoption of smartphone, leading to a rise in the distributed discovery of news through social media and other platform intermediaries, progressively influenced by algorithmic selection. Additionally, it identified voice assistants such as Alexa and Google Home as another growing segment for news consumption.

For blind and visually impaired (BVI) individuals, who face multiple challenges in accessing basic human rights, such as education, healthcare, and social protection, news serves as a vital source of information. Not only does it enable them to stay informed and equitably participate in civic activities [38], but also acts as a source of empowerment [2]. Prior research has highlighted the struggles of print-impaired community, including BVI individuals, in staying updated with current news events [42]. As digital news access and personalised news discovery become more prevalent, the preferences and methods of news consumption among BVI individuals, notably early adopters of AI [15], have evolved.

While extensive prior research has explored the evolution of other digital consumption patterns among BVI individuals, including smartphone usage [35, 65], social media engagement [7, 80], and voice input usage [12], there remains a gap in understanding their current digital news consumption behaviors. Moreover, the majority of these studies have been conducted in Western contexts, raising questions about their applicability to Global Southern countries like India, which have recently witnessed a significant increase in digital adoption. Remarkably, India is also home to the largest population of blind and visually impaired (BVI) individuals worldwide, with approximately 4.95 million blind and 35 million visually impaired citizens [46]. We believe that examining their current consumption habits, patterns, motivations, challenges, and workarounds could provide valuable insights for designing accessible digital news platforms, fostering further civic participation and strengthening community ties.

Accordingly, we conducted a qualitative user study, comprising of news consumption sessions and in-depth semi-structured interviews, with 17 BVI individuals in India, asking about their motivations, preferences, barriers, and workarounds in news consumption experiences. Our research uncovers diverse motivations for news consumption, such as achieving upward social mobility, fostering civic awareness and participation, and learning English. We also observed an interdependence between news engagement strategies (such as active or passive) and output modalities (such as audio or text). For instance, the act of "reading" news was attributed to text-based modalities, while the act of "listening" news was linked to audio-based modalities. Furthermore, news selection

criteria for BVI users expanded beyond their accessibility needs, and instead centered around neutrality and coverage. Finally, our findings shed light on the current state of digital news accessibility, underscoring key issues such as advertisements and the reliance on human infrastructure as a makeshift solution. The main contributions of this paper are twofold:

- We examine the digital news consumption patterns among BVI individuals in India, uncovering their diverse motivations, engagement strategies, and barriers to accessing news.
- We offer design recommendations for future research and development of accessible digital news platforms.

2 Related Work

This work draws and builds upon prior research focusing on the evolving patterns of news consumption, digital media accessibility and BVI community in India within the context of HCI research.

2.1 Evolving Patterns of News Consumption

The news landscape has transformed, fueled by rapidly-evolving technologies, witnessing shifts in both presentation and consumption patterns [44]. Traditional news sources, including print newspapers, radio, and television have long served as pillars of information dissemination. However, their usage has been on a decline. Jones [36] highlighted a "dearth of reliable, traditional news" due to the receding circulation of print newspapers. Digital sources like news websites, social media, and aggregators have gained popularity as convenient alternatives [24]. Additionally, online news platforms offer enhanced user control, selection, and navigation abilities compared to traditional news media [70].

The declining usage of traditional news media can also be attributed to the demographic characteristics of young adults' preference to "snack" on news [25] rather than "appointment viewing" of news, valuing brevity over in-depth coverage. News snacking, as described in the literature, involves shorter and dispersed bursts of consumption, as opposed to sustained sessions [50]. This behavior is further catalyzed by the rise of social media, which has led to a significant increase in incidental exposure to news sources [28]. As users are frequently redirected to news websites through referrals on social platforms, there's a growing perception of "news finds me," [59], where individuals believe important news will naturally come to them through their general media use and social connections. In addition, several prior studies have investigated information foraging patters in context of news [71]. Tewksbury et al. found that news readers' selection behavior is typically guided by two approaches towards information foraging–browsing and selecting [71]. *Browsers* explore a wide variety of news topics by glancing at headlines as fundamental guides to discovering and then reading specific articles unlike *selectors*, who actively attend only to topics of interest.

This shift towards adoption of digital sources and incidental access to news is further amplified by the widespread adoption of mobile devices such as smartphones and tablets that have enabled "news consumption on the go" [78], resulting in more individualized patterns of news intake that cater to the immediate interests of consumers. Consequently, this has paved the way for the emergence of digital news aggregators and news recommendation engines [72],

such as Google News, which curates custom news for each individual from diverse sources. Due to their growing popularity, prior studies have focused on several aspects of news recommendation and aggregation – enhancing curation algorithms [11, 26], trust in aggregators [27], and consumption patterns [57].

While the aforementioned studies have predominantly focused on the Global North, there has been growing attention towards the digital news divide [31]. This divide can manifest in ways beyond differences in access, such as variations in content preferences and consumption habits. To bridge this disparity, prior work has attempted to understand the digital news consumption landscape of underserved communities, such as by exploring the gaps associated with gender and economic development. For instance, Toff [73] argued how the gender inequalities within households continue to exert considerable influence over news consumption habits, perpetuating ongoing gaps between the genders. Similarly, Mukherjee et al. [54] conducted a quantitative assessment of the online news consumption behavior of Indian internet users, and highlighted current trends around consumption of global, national, regional, and emerging digital news sources. However, despite the efforts, majority of the studies fail to account for the diversity of experiences and inequalities among disabled communities.

2.2 Digital Media Accessibility

Digital media, encompassing websites, podcasts, and social media, introduces novel forms of interactions between consumers and content, distinct from traditional print and broadcast media [64]. Hargittai et al. [33] highlighted the emergence of a digital divide in the era of new media, stemming from disparities in technological access and online abilities. Researchers have stressed the importance of designing interfaces that cater to diverse user needs, including those with disabilities [41]. Specifically focusing on BVI individuals, prior research has addressed web and mobile accessibility.

Studies in web accessibility have focused on developing guidelines [40], evaluation methods [14, 39], and assistive technologies [14, 79]. For example, Lazar et al. [40] investigated the frustration of blind users on the web, offering insights for web developers and screen reader designers, while Leporini and Paternò [43] devised a set of usability criteria for accessible web pages. Additionally, several studies have highlighted the significance of adherence to accessibility standards such as the Web Content Accessibility Guidelines (WCAG) [35, 40]. The WCAG [21] were published by the World Wide Web Consortium (W3C) for establishing a universally recognized benchmark of web content accessibility. Despite being the de facto standard, they have been widely critiqued [22] in prior work particularly regarding conformance [3, 10, 20, 48, 63, 68, 77], coverage [17, 29, 60] and evaluation [74]. Prior research has studied, and continues to explore, various operational barriers that BVI users encounter when navigating web content [16, 18, 66].

On the other hand, mobile phones and other portable devices offer greater autonomy for people with disability, enabling them to perform tasks independently, while also providing them a window to society [4]. Consequently, users switch to such devices despite known usability issues [58]. Kane et al. [37] conducted an extensive literature review that revealed the everyday accessibility problems that BVI users encountered while using them and

their workarounds, such as using multiple devices in conjunction to overcome the limitations of each individual device. They proposed recommendations to improve mobile accessibility, such as the need for increased reconfigurability to arbitrary settings. The latest mobile devices are equipped with an application ecosystem that offers a wide range of features, allowing the completion of daily tasks on the go. However, most mobile apps continue to pose accessibility challenges for screen reader users, such as missing alternate text, unlabelled buttons, and complex navigation [23], despite the availability of mobile accessibility guidelines [13].

Previous studies have addressed general mobile and web accessibility, but there is a gap in understanding the specific challenges faced by BVI individuals when accessing news content. Recent studies have uncovered specific barriers, such as data-driven visualizations, which exacerbate news inequity for the BVI community, especially during global crises like the COVID-19 pandemic [34, 68]. However, existing literature tends to either broadly address general accessibility issues or narrowly focus on specific elements like visualizations in news content. Our study aims to bridge this gap by examining how both broad and specific barriers collectively impact news consumption for the BVI community.

2.3   BVI Community in India

Despite the enforcement of the Rights of Persons with Disabilities (RPwD) Act, 2016 in India, which was aimed at ensuring ICT accessibility, the implementation of its recommendations often falls short, leading to persistent accessibility barriers on numerous websites, including major news portals [49]. This issue is particularly concerning as it denies BVI individuals the right to access news. Remarkably, these accessibility challenges extend even to websites operated by the government of India. For instance, a comprehensive study conducted by the Centre for Internet and Society (CIS) revealed that out of 7800 websites of the Government of India and its affiliated agencies, 1985 failed to open and 97% of the remaining had at least one known accessibility issue [1].

Despite systemic issues in digital accessibility, there is a scarcity of research in HCI and CSCW that have delved into the news consumption experiences of BVI individuals in India. Mudliar et al. [53] studied emergent practices around CGNet, a voice-based forum to foster citizen journalism. Tools like CGNet found particular interest within BVI communities in rural India for news sharing and consumption. More recently, studies have investigated smartphone usage patterns among diverse BVI communities in India [32, 35]. For instance, Jain et al. [35] logged smartphone usage data of expert BVI smartphone users in India to unveil novel interaction patterns such as extensive use of directional gestures, and reliance on voice and external keyboard for text input.

While existing research has investigated news consumption practices across various contexts, there exists a notable gap in understanding the news consumption behaviors of BVI individuals in India. Our study endeavors to address this gap.

3   Research Questions

Our research sought to investigate the following research questions:

- **RQ1:** What drives news consumption preferences among BVI individuals in India?

- **RQ2:** What methods and infrastructure do BVI individuals currently use for interacting with news sources?
- **RQ3:** What are the primary barriers that they encounter in accessing (digital) news and their workarounds?

4   Methods

We conducted a qualitative study to understand the digital news consumption practices among BVI individuals in India. Upon receiving approval from Institutional Review Board (IRB), our study took place between December 2022 and June 2023, in India, and consisted of contextual inquiry followed by semi-structured interviews with 17 BVI individuals.

4.1   Participants

We employed convenience sampling and snowball sampling methods to recruit participants for our study. The eligibility criteria for participation stipulated that individuals were visually impaired and reported regular consumption of news through self-assessment. Initially, we advertised our study through mailing lists administered by non-profits dedicated for the empowerment of the BVI demographic, such as Access India [5] and Vision Empower [75]. However, we noted that participants recruited through these lists primarily hailed from urban areas, representing English speakers with online access, skewed towards male, affluent, and educated individuals.

To enhance sample diversity, we urged our participants to share study details within their networks, specifically targeting individuals from rural areas, who consume local language news. This strategy facilitated further recruitment from underrepresented regions and linguistic backgrounds. Recruitment continued until data saturation was achieved. Our study included 17 participants, comprising 2 women and 15 men, spanning an age range of 18 to 67 years. Among them, 9 were from urban India, 4 from semi-urban, and 4 from rural India. 13 participants had congenital visual impairments, while 4 developed visual impairments later in life. All participants consumed some news in English, with 11 individuals additionally also consuming news in their respective local languages. All our participants were regular news consumers, with 14 consuming news daily and 3 several times a week. Table 1 presents the demographics data of our participants.

4.2   Study Procedure

Given the geographic diversity of our participants across India, we conducted the sessions online using videoconferencing platforms selected by our participants such as Zoom and Microsoft Teams. Additionally, we conducted two sessions via phone call for participants who were not comfortable with videoconferencing platforms. The participants were asked to join the session using the device that they regularly use for news consumption, such as smartphone, laptop or tablet.

All user study sessions comprised two components: 1) a contextual inquiry of their natural news consumption, followed by 2) a semi-structured interview. The sessions began with a brief explanation of the research, followed by obtaining verbal consent from the participants. The participants were first asked to share their screens and system audio and access any news source(s) of their liking, as

Table 1: Participant Demographics Data (N = 17) [* VI: Visual Impairment; CB: Complete Blindness; LV: Low Vision]

	Age	Gender	Education	Occupation	VI*	Location	Setting	Languages
P1	31	Male	Graduate	Student	CB*	Delhi NCR	Semi-Urban	English
P2	28	Male	Postgraduate	Employee	LV*	Maharashtra	Urban	English
P3	27	Male	Postgraduate	Trainee	CB*	Karnataka	Urban	English
P4	38	Male	Diploma Holder	Transcriptionist	CB*	Karnataka	Urban	English, Hindi
P5	40	Male	Postgraduate	Bank Manager	CB*	Karnataka	Urban	English
P6	30	Male	Postgraduate	Consultant	CB*	Delhi NCR	Urban	English
P7	41	Male	Postgraduate	School Teacher	CB*	Telangana	Rural	English, Telegu
P8	30	Male	Graduate	Bank Manager	CB*	Gujarat	Semi-Urban	English, Hindi
P9	41	Male	High School	Consultant	LV*	Karnataka	Urban	English, Telegu
P10	25	Female	Postgraduate	Customer Support	CB*	Karnataka	Urban	English, Kannada
P11	40	Male	Postgraduate	Employee	CB*	Maharashtra	Urban	English
P12	38	Female	Postgraduate	Bank Manager	CB*	Delhi NCR	Urban	English, Hindi, Marathi
P13	23	Male	Graduate	School Teacher	LV*	Andhra Pradesh	Rural	English, Hindi, Telegu
P14	18	Male	High School	Student	CB*	Madhya Pradesh	Rural	English, Hindi
P15	62	Male	Postgraduate	Retired	CB*	Delhi NCR	Semi-Urban	English, Hindi, Sanskrit
P16	67	Male	Postgraduate	Retired	CB*	Rajasthan	Rural	English, Hindi, Braj
P17	30	Male	Graduate	Student	CB*	Jharkhand	Semi-Urban	English, Hindi

they do on any ordinary day on their devices for up to 30 minutes. While the participants were accessing news, two researchers present on the call silently observed participants' usage patterns, took detailed notes, and only asked clarifying questions. We chose silent observations over the think-aloud study method to minimize the cognitive load on our participants, who, being screen reader users, would have to listen to both consume news and interact during the interviews. However, some participants enthusiastically walked the researchers through different news sources, emphasizing the specific difficulties they encountered with each, making the sessions more conversational.

Following the contextual inquiry, the participants were asked questions around motivation for news consumption, experiences accessing digital news, challenges encountered and workarounds, and aspirations with respect to news consumption. The sessions were video-recorded, conducted in English and Hindi languages by the first and second author, and lasted approximately 40–75 minutes. Upon completion of the interview, participants were compensated with an Amazon gift voucher worth INR 500 for their time and involvement in the study.

4.3 Data Collection and Analysis

The collected data consisted of video recordings of the sessions (totaling 14.82 hours, including participants' shared screens), screen reader narrations, and detailed handwritten notes by the authors. Following each session, we anonymized the data by assigning unique identifiers, such as [P#], to each participant. We then transcribed the audio using an AI model, OpenAI Whisper, for initial transcription, followed by manual correction. We analysed the data using inductive thematic analysis [19], which was conducted concurrently with the interviews. As we continued to recruit language-diverse participants, we found that all participants, regardless of language differences, struggled to find digital news content. This

resulted in similarities among participants, leading to early saturation in our findings. All the authors read through the transcripts rigorously and met frequently to discuss the emerging codes. We included the observation notes for thematic analysis and analyzed screen recordings to capture source names and fill in gaps, identifying supplementary codes. Some initial codes that emerged were: 'ergonomics', 'engagement', 'advertisements', 'social mobility', 'familiarity', and 'coping mechanisms'. The codes were later clustered into high-level themes around motivations for news consumption, news engagement strategies, and factors influencing source selection, access barriers and workarounds.

4.4 Researcher Positionality

All authors are of Indian origin, currently living in India and/or the United States and have conducted research with diverse marginalized groups in India. Two authors identify themselves as female and one as male. All the authors have more than two years of research experience in examining accessibility needs of people with disabilities in the Global South. We are, thus, well-positioned to examine news consumption practices among BVI individuals in India. Our motivation to study this topic was to uncover unrealized opportunities in designing technologies tailored for this community.

4.5 Limitations

Our findings infer patterns, preferences, and access barriers derived from intentional news consumption experiences. However, these insights may not fully capture the intricacies of how BVI individuals interact with news content in their daily lives. Given the advent of social media, our study likely overlooks encounters with incidental news discovery, sharing, and verification. Furthermore, our study enlisted 17 participants, which, while typical for this type of study, is a relatively small number and not fully representative of the entire Indian BVI population. Finally, our research is confined to the Indian context, potentially limiting the applicability of our findings

to other cultural and geographical settings. Variations in cultural norms and disparities in digital infrastructure and accessibility policies across regions may shape news consumption practices among BVI individuals differently. These limitations underscore the need for future research to explore a broader range of news consumption behaviors and contexts within the BVI community.

5 Findings

Here, we present our findings broadly centered around the news consumption practices of people with vision impairments in India and their accessibility related barriers in consuming digital news.

5.1 Current News Consumption Practices

Figure 1 depicts the preferences for devices, media platforms, and publishing brands among our participants. This section further elaborates on the observed trends, focusing on the motivations, engagement strategies, and selection criteria that shape the news consumption practices of BVI individuals.

5.1.1 Motivations for News Consumption. Purcell et al. [61] portrayed news consumption as an activity deeply intertwined with social engagement and driven by social factors. When prompted about their motivation, our participants shared similar sentiments, albeit elevated by the marginalization they experienced as BVI individuals. A majority of our participants (N=8) claimed their drive to consume news stemmed from an urge to actively participate in meaningful conversations with their friends, family, and coworkers. P5 expressed feelings of social backwardness when discussing current events with his coworkers, which served as an impetus to engage with news: "*I have an inferiority complex, like I am far behind the world.*" On the other hand, P15 leveraged news as a way of bonding with his grandchildren, "*introducing them to worldly matters*". In addition, several participants also believed that staying updated through news empowered them to adopt informed positions, make deliberate choices, and fulfill their civic responsibilities.

Our participants leaned heavily on the knowledge they acquired while consuming news to help them achieve their learning objectives and advance their careers. P2 subscribed to work-related publications on social media for awareness about global trends, "*My work revolves around electric vehicles, so I follow specific EV related publications, like Electrek*", aiding him in making informed business decisions in his role. Likewise, P3 elaborated on shared aspirations among BVI people, "*Most of visually impaired people want to achieve something in life... like get a government job... we depend on news channels.*", emphasizing the need to stay up-to-date for remaining competitive in this information era. In fact, four participants actively read news to prepare for competitive exams for esteemed government job opportunities. E.g.,

> "My main intention is to prepare for civil services and other government exams. For that, current affairs is very important. And we get to know about current affairs mostly through newspapers." **(P10)**

While some participants were currently preparing for competitive exams, others cultivated the habit of daily news consumption during their preparation in the past and continue to maintain that routine. Moreover, certain participants, particularly those hailing

from rural India, revealed that their primary motivation was to acquire proficiency in English, as English is the language of influence and power in India [9], and is strongly associated with higher earning potential [30].

5.1.2 Active and Passive News Engagement Strategies. Differences in active and passive engagement with news sources are a critical dimension in understanding consumer experiences [45]. Active engagement is an interactive and proactive approach to consuming news, while passive engagement occurs due to limited attention while seeking information. We observed significant variations in experiences based on their engagement practices.

Our participants accessed digital news in two modalities, text and audio. Text-based modalities included news media websites/ applications, social media platforms, and news aggregators, and were accessed by our participants through screen readers. Audio-based modalities comprised of audio and audiovisual media, such as television, radio, YouTube, and smart speakers. Interestingly, while eventually both modalities converged to audio for our participants, they associated the term "reading" with accessing the former and "listening" with the latter, as described by P12, "*I consume news in two ways, by newspaper **reading** online, and by **listening** to some [news] videos on YouTube.*", perhaps due to the additional navigational capabilities provided by screen readers.

Participants preferred utilizing audio-based modalities for headlines or news briefings as a convenient form of passive engagement. P12 elucidated that the absence of navigation while listening allowed her to solely rely on auditory engagement, freeing up her time for concurrent multi-tasking. Our participants avidly employed such modalities to "snack" on these news during their commutes, meals, or when prone to interruptions by other household members sharing their space [25]. E.g.,

> "I listen to news (passively) throughout the day, my TV is on throughout... Actually, we three live here - me, my son and my younger brother. So there is disturbance when someone comes or goes." **(P16)**

Further, our participants valued simple and user-friendly navigation options (like play, pause, and forward) when accessing audio-based news, as it made passive engagement more enjoyable. On the other hand, these audio-based modalities were also described as "*limiting*", especially when participants wanted to read actively. E.g.,

> "TV is the best while having dinner or watching news with family. In television news, they don't cover all the points, they just tell the main topic. But at the end of an article, we will have options to read similar news or news related to the topic." **(P3)**

Additionally, when engaging actively with news, many of our participants (N=7) preferred consuming news through laptops, offering better navigational support, or tablets, with larger screen sizes. This is in contrast to the India Digital News Report [8], which characterized India as a 'mobile-first market', indicating a strong preference for smartphones for news access over other devices. E.g.,

> "I want to read it like a traditional newspaper, sit down and spend a good half an hour with it, rather than just popping in during the day. I just like the way I can hold an iPad and read. Somehow on the iPad apps feel

Figure 1: Popular devices, publishing brands, and media among our participants.

less cluttered (than on iPhone). There's more space and it just feels nicer to scroll through articles." **(P2)**

Here, we see how better navigational support and fewer distractions facilitate "appointment viewing" of news for our participants [25]. These devices have fewer distractions compared to smartphones, where incoming calls and notifications frequently interrupted the flow of news content narration. While some participants disabled these notifications on their smartphones to prevent unnecessary interruptions, others utilized them to periodically glance at the headlines throughout the day, to keep themselves abreast of the breaking news, as a means of interspersed passive engagement.

5.1.3 News Selection Criteria. News consumption is deeply influenced by individual preferences, beliefs, and needs. We found that our participants weighed a variety of factors in choosing their news sources, i.e., publishing brands. Surprisingly, source accessibility, while important, did not emerge as the predominant consideration among our participants. Rather, other news quality attributes such as convenience, coverage, trust, and neutrality took precedence in shaping their consumption preferences. Participants often forwent accessibility requirements to gain access to topics that held specific interest for them. E.g.,

> "Economic Times is probably the worst (inaccessible) app, but that's the app I use a lot because, for my work, I have to keep myself updated." **(P2)**

Here, we see how our participants were compelled to depend on certain traditional news sources for their work, despite encountering accessibility challenges. This reliance on particular news sources was frequently associated with their perceived authenticity and neutrality. For instance, P7 emphasized choosing only credible sources, stating, "*Typically, I only go to a particular source… only authentic sources.*", indicating a reliance on established news brands with credibility. Trust in news sources for unbiased reporting was paramount. P4 explained the process of recognizing neutrality, noting, "*Once you start consuming news on a daily basis… you will very easily understand which media house is neutral or not neutral.*" Yet, when exploring what neutrality meant, participants conveyed that perceptions of impartiality were subjective and varied significantly with individual viewpoints on specific issues.

In addition, P10 underscored the value of comprehensive content, advocating for extensive topic coverage. However, this desire for wide-ranging content sometimes compromised convenience, as P14 expressed,

> "Even though Hindi is my mother tongue and I'm more comfortable with it, I cannot overlook English sources. Compared to Hindi, English sources offer better, more useful and knowledgable content." **(P14)**

Conversely, convenience occasionally trumped coverage, as illustrated by P1's preference for partially accessible e-Newspaper PDFs:

> "If I have a PDF it hardly matters whether the internet is working or not because where I am living there is a very big problem of internet accessibility, so anyhow if I am able to download, then it is very easy to access… Sometime some articles are not covered in PDF format." **(P1)**

5.2 Accessibility in the Digital News Ecosystem

Here, we present the current accessibility landscape in news consumption among BVI individuals, informed by our observations during contextual inquiries. We hone in on aspects that were either unique to the existing body of work in digital media accessibility or had a profound influence on news consumption.

5.2.1 Barriers in News Access. Our participants encountered numerous operational barriers, as depicted in Figure 2, when accessing news on digital platforms. The most significant challenge was the overwhelming presence of ads and popups in web and mobile applications, as P9 succinctly put it: "*ads are our biggest enemies*". We noticed the presence of flash-based image advertisements, leading to unexpected website refreshes, resulting in cursor displacement and loss of focus for screen readers. Further, participants also reported difficulty in skipping advertisements on video platforms such as YouTube. E.g.,

> "We don't know whether it's a compulsory ad or not, that's inaccessible, so we keep looking for the skip ad button… It gets difficult to navigate." **(P12)**
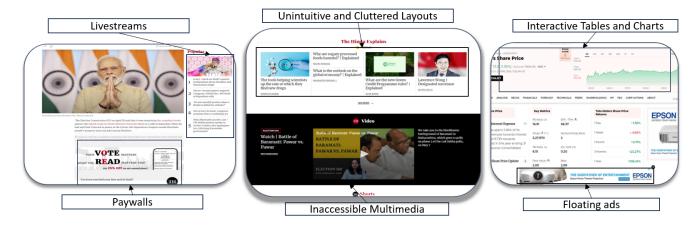
Figure 2: Examples of access barriers in news websites.

Additionally, our participants described news platforms to be cluttered, with intrusive elements, such as related news recommendations, interrupting the flow of the article. They also struggled when encountering news articles behind paywalls, as this was not always discernible with screen readers. Unlabelled buttons and links presented another recurring hurdle as they deprived our participants of important navigational context and organisation. Conversely, audio-based platforms such as virtual assistants lacked this organisation hierarchy altogether. E.g.,

> "If a news article is not interesting, we can just skip and go to the next headline. But Google (Assistant) does not have that feature, we have to listen to the entire story. We have the option to forward the news, but still, we don't have the option to move to the next headline." **(P3)**

Another key challenge participants faced while engaging actively was glanceability or being unable to quickly grasp the emphasised features in a visual layout. E.g.,

> "A sighted person can see and think which information they want to read after opening the website. You can see, then scroll and then you can click. But how can we do the same?" **(P4)**

This presented a significant hurdle, especially when participants aimed to dive deeper into a particular issue. Additionally, our participants shared that news platform interfaces often felt unintuitive. For example:

> "(An interface is intuitive) when I can open an app, run my finger across the articles on my iPad, and immediately understand how they are arranged. I can visualize the layout in my head and know what to do. The problem with news websites is that I typically have no idea how they are arranged." **(P2)**

Participants described news websites having live newstreams with real time news broadcasts, e.g., live sports coverage, which made the interface incomprehensible due to inconsistencies in navigation. Another comprehension barrier our participants encountered was the poor readability of local language news content, commonly

presented in non-unicode text fonts, making it inaccessible to screen readers. E.g.,

> "Most of the (Telegu) websites do not use the unicode font, it cannot be read by a screen reader so I generally use my limited eyesight and turn off the screen reader because it reads all nonsense." **(P9)**

Another prominent problem our participants grappled with was the presence of inaccessible multimedia content. We observed that most news websites and applications in India did not comply with the WCAG [21], and did not have appropriate, if at all, descriptions for visual content. Even when the alternative texts were made available for images, they failed to sufficiently capture the visual context. This was especially evident with graphs, charts, and tables, as their captions failed to provide essential information, including data values - details that readers preparing for competitive exams frequently required. E.g.,

> "If a table is inserted, we cannot navigate through it. When I am reading sports related news or finance news... that's very important actually because for competitive exams they pick that information only. So in these newspapers, they will put a chart but in the description they will not give the entire information, only what is important, like 6 month data... The other months are missing and maybe the question is from that." **(P10)**

Furthermore, our participants described several occurrences of news video content characterized by the presence of visual text accompanied by background music, devoid of any audio narration. Additionally, participants with low vision highlighted limitations in zooming capabilities and challenges with brightness and contrast settings on these platforms. They also expressed difficulties in reading physical newspapers due to exceedingly small fonts and insufficient line spacing. Lastly, e-newspapers offered by traditional media organizations were presented in scanned image PDFs, rendering their content inaccessible to screen readers.

5.2.2   Solutions, Stopgaps and Support. We observed our participants employed keyboard shortcuts, e.g., pressing 'H' for navigation

by headings, 'G' for navigation by graphics or thumbnail captions, and the down arrow key for accessing author names (on specific news websites). Nonetheless, these were learned over a significant period, often months, and did not work on new or unfamiliar sources. Our participants extensively used the weblinks menu and virtual viewer by pressing 'Insert + F1' to familiarize themselves with the navigational landmarks of a new web page, such as headings, subheadings, paragraphs, regions, and links. However, it is important to note that the effectiveness of this workaround was contingent on the website's compliance with the WCAG. Participants opened each article in a new tab to maintain the screen reader's focus on the original web page. They also installed ad blocker extensions, though as P6 pointed out, their efficacy varied across devices:

> "I've tried a few ad blockers on my mobile phone, but with mixed results, they end up consuming quite a lot of battery as well as data despite their claiming not to do so. But on my laptop, thankfully, I have been able to eliminate ads with an extension." **(P6)**

Our participants often relied on human infrastructure to overcome barriers to accessing news. Two participants reported reading news from volunteer-driven free e-newspapers shared daily by the Braille section of the Anna Centenary Library (Braille ACL) in Chennai. E.g.,

> "They (Braille ACL) send news on email in HTML format, so it is very easy to navigate through the headings and paragraphs." **(P1)**

However, our participants raised concerns about the uneven coverage of different news topics by the Braille ACL and reported their current availability exclusively in English and Tamil languages. Further, they described these e-newspapers to be infrequent and intermittent. While P5 claimed he did not receive the e-newspaper that day, P1 highlighted that their delivery misaligned with his schedule, claiming *"If they will send the newspaper today, it is very hard to read then (as I am in office), so I read it the next morning"*.

To delve deeper into specific news topics, P13 listened to narrations and interpretations of particular stories relevant to his exam preparation, recorded by his sighted friends and shared on WhatsApp. Other participants instead interacted with virtual assistants or chatbots as they could offer concise summaries from multiple news sources. E.g.,

> "Recently I started using ChatGPT, so when you want to know about a particular topic it shows you in detail only about that, instead of listing down websites. **(P9)**

Similarly, P15 utilized Alexa to inquire about specific details within news stories but found it to be inadequate and frequently inaccurate. Consequently, he felt compelled to fact-check the information, either by having his son verify it online or by re-asking Alexa later.

Furthermore, participants downloaded additional optical character recognition (OCR) applications such as Text Freedom and Envision to extract text from inaccessible graphics and tabular visuals in news applications. Despite these efforts, P10 and P14 reported significant inefficiencies, specifically the excessive amount of time consumed by the need to constantly switch between applications to perform OCR on images. Moreover, they pointed out that the

OCR results often lacked proper ordering, especially critical when interpreting data from graphs, leading to inaccurate outputs. On the other hand, P11 preferred skipping images altogether by subscribing to textual RSS feeds using a paid aggregator application called LIRE Reader,

> "So this is completely accessible. So in the settings, once you delete all images, it becomes very easy to go to the article. It's uncluttered basically. And for me, images have no value really." **(P11)**

5.2.3 Impact of Limited Access. The most profound impact of the aforementioned barriers was a lag in informational access. Our participants reported delays in receiving news, which often resulted in missed opportunities and a diminished sense of connection with current events. P4 accurately summarized, *"I'm not getting the right information at the right time."* Such delays were not merely inconveniences but also affected their participation in communal gatherings and discussions. This was especially true for local news, arguably indispensable for social engagement, as P17 noted:

> "Small local events like if there is a seminar in school, it is covered only in (print) newspapers." **(P17)**

Furthermore, as our participants spent time mastering navigation workarounds for specific news sources, they found that the comfort and familiarity they gained quickly became a double-edged sword when they tried exploring unfamiliar platforms. Participants felt compelled to stick to known sources, which limited their exposure to diverse viewpoints and a broader range of information. The onus of accessibility often fell unfairly on the visually impaired community. They repeatedly expressed sentiments of isolation and neglect, emphasizing a lack of empathy amongst news agencies. E.g.,

> "When I read a news of my interest and come across a graphic, I only have to do OCR, they (news agencies) should also care about our (BVI) community." **(P14)**

6 Discussion

Our results showed that news consumption patterns in the BVI community diverged from broader trends, with current access to news being, at best, patchy. In this section, we situate our findings within prior work and offer actionable recommendations for developing accessible digital news platforms.

6.1 Reflections on Findings

Our participants actively and intentionally sought out news to initiate social conversations, contrasting with the broader perception of "news finds me" through social connections. Furthermore, only a few participants mentioned finding news through social media or web search, differing from the broader trends in Indian news consumption, where distributed discovery is prevalent. This indicates that prior news consumption research may lack adequate representation of the BVI community in their analyses. Furthermore, it is somewhat surprising that within the context of our study, our participants' desire for social interaction did not translate into increased social media news consumption and engagement. This could be due to their need for trust and the additional effort required for fact-checking social media content. Despite this, the limited accessibility

to diverse news sources, even those perceived as neutral, might create echo chambers and inadvertently contribute to increased polarization. This is concerning, especially in India, where there are ongoing discussions about biased reporting and the reinforcement of majoritarian viewpoints by mainstream news media [69].

Further, we discovered that accessibility requirements for digital news media have unique challenges compared to other digital content, such as social media. Our participants emphasized the presence of cluttered layouts, dynamic content, and lack of structured navigation as specific issues with digital news platforms. Unlike social media, where content is often visual and concise [51], they expressed a strong desire for features that allow them to efficiently skim through content and navigate to stories of interest. Additionally, our study uncovered an interesting tension between preferred news modalities and their navigational control among our participants. While audio-based news was easy to navigate with basic commands, it lacked fine-grained control, compelling users to listen to entire clips. Conversely, text-based news offered detailed navigation via screen readers, but with a steep learning curve.

Our findings underscored barriers to news accessibility, and, more broadly, digital media accessibility. While there are promising directions towards designing more accessible digital news platforms (as discussed next), fundamental issues persist in the approach to accessibility in India. Rather than being treated as a core design principle, accessibility is often perceived as a "good-to-have" or a "secondary" consideration in technology design [62]. We recommend taking a step back and advocating for the incorporation of digital accessibility education into school curriculum, urging researchers, designers, practitioners, and policy makers to cultivate the awareness around digital accessibility bottom-up.

6.2 Design Implications

This section presents a few recommendations for designing accessible digital news platforms drawn from our findings.

6.2.1 Navigational Assistance for Advertisements. All our participants unanimously cited advertisements as the primary obstacle to seamless news consumption, expressing a desire for ad-free platforms. However, given that news media rely heavily on advertising for revenue, eliminating ads entirely is not feasible. The challenge lies in balancing the need for ads with the user experience, particularly for BVI users who are unable to dismiss or skip them with the same ease as sighted users. To address this, we recommend that news platforms implement features to assist in ad navigation. This could include clearly indicating whether an ad is skippable and providing keyboard shortcuts for skipping the ad content. Additionally, to prevent disruption in reading flow, interactive ads and pop-ups should be designed to open in new tabs, preserving the user's location in the original article. Finally, enhancing the accessibility of ad content is beneficial for both publishers and BVI users. There is an opportunity for innovation in accessible advertising in exploring non-visual formats for interactive ads.

6.2.2 Digitization of Local Language Newspapers. Indian languages dominate print circulation, which continues to grow [56], contrary to the decline in print media observed in the Global North. Dependence on traditional media and limited digital infrastructure hampers local news coverage in semi-urban and rural areas of India. Nonetheless, local news is essential for fostering community engagement and providing BVI users with relevant information pertinent to their immediate environment. In our study, we observed that participants heavily relied on volunteer-driven accessible newspaper mailing lists. However, these newspapers often lacked comprehensive coverage, as we know through our prior community engagements that volunteers frequently copy and paste text from the "text view" windows of individual articles, which are unavailable for many news stories.

Non-profits, such as the DAISY Forum of India, offer digital books and magazines in local languages made accessible on demand for BVI users through Sugamya Pustakalaya [55]. However, manual remediation of print document PDFs takes time, often taking weeks for correction and publication on their website, which does not align with the timely nature of daily news. Thus, there is a pressing need for research into automated digitization solutions [6] for local language newspapers, which can convert newspaper images into screen-reader-friendly text formats. Multi-modal foundation models, such as GPT-4V, have shown impressive OCR performance for Latin scripts and can be leveraged for this purpose. However, their current OCR capabilities for other scripts remain limited [67]. Further research and evaluation are necessary to enhance their performance on local language newspapers, ensuring that BVI users have prompt access to critical local updates such as weather alerts, emergency services, social events, and policy developments.

6.2.3 Conversational Glanceability Support. Our study unveiled navigational challenges in accessing unfamiliar sources due to cluttered and unintuitive visual layouts of news sources. These findings highlight the need for future research to explore methods of explaining visual interface layouts to BVI users. Based on recent trends in user interface understanding, we suggest investigating conversational agents as a viable solution. These agents have demonstrated a remarkable extent for interpreting and executing diverse multimodal interaction tasks through natural language instructions [76]. This capability aligns with the adaptive strategies employed by our participants, who frequently relied on conversational agents for deeper engagement with content. Furthermore, these agents offer potential for locating visual cues [52] within digital interfaces, enabling users to focus their attention on areas of interest, paving the way for "glanceability" in news media platforms.

7 Conclusion

While news consumption plays a pivotal role in fostering social participation, the specific needs and experiences of the blind and visually impaired (BVI) community in accessing digital news remain largely unexplored. In this work, we studied the current digital news consumption patterns of BVI individuals in India. Through news consumption sessions and semi-structured interviews with 17 participants, we investigated their interaction strategies, and found that their access to news and pertinent information was often limited and delayed. Based on our findings, we suggested implications for researchers, designers and policymakers for the development of more inclusive and accessible digital news platforms.

References

[1] 2016. Accessibility of Government Websites in India: A Report. https://cis-india.org/accessibility/accessibility-of-govt-websites.pdf

[2] 2022. Introducing Newsline: Access Technology to Newspapers for the Blind and Visually Impaired. https://www.independentliving.org/docs4/newsline.html#:~:text=Less%20tangible%2C%20but%20possibly%20even,to%20the%20newspaper%20means%20empowerment.

[3] Julio Abascal. 2022. Web accessibility and beyond in eGovernment: does web accessibility ensure accessibility to administration's websites?. In *Proceedings of the 19th International Web for All Conference*. 1–3.

[4] Julio Abascal and Antón Civit Balcells. 2000. Mobile communication for people with disabilities and older people: New opportunities for autonomous life. In *6th ERCIM Workshop" User Interfaces for All"(2000)*. WG UI4ALL.

[5] Access India. [n. d.]. Access India. https://www.accessindia.org.in. Accessed: 2024-07-24.

[6] Vishal Agarwal, Tanuja Ganu, and Saikat Guha. 2022. Broken News: Making Newspapers Accessible to Print-Impaired. *arXiv preprint arXiv:2206.10225* (2022).

[7] Gkatzola Aikaterini and Konstantinos Papadopoulos. 2022. Facebook usage and quality of life of individuals with visual impairments. *British Journal of Visual Impairment* (2022), 02646196221117644.

[8] Zeenab Aneez, Ahmed T Neyazi, Antonis Kalogeropoulos, and Rasmus Nielsen. 2019. India digital news report. *Reuters* (2019).

[9] Elay Annamalai. 2004. Medium of power: The question of English in education in India. *Medium of instruction policies: Which agenda? Whose agenda?* (2004), 177–94.

[10] Humberto Lidio Antonelli, Sandra Souza Rodrigues, Willian Massami Watanabe, and Renata Pontin de Mattos Fortes. 2018. A survey on accessibility awareness of Brazilian web developers. In *Proceedings of the 8th international conference on software development and technologies for enhancing accessibility and fighting info-exclusion*. 71–79.

[11] Shubham Atreja, Shruthi Srinath, Mohit Jain, and Joyojeet Pal. 2023. Understanding Journalists' Workflows in News Curation. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. 1–13.

[12] Shiri Azenkot and Nicole B Lee. 2013. Exploring the use of speech input by blind people on mobile devices. In *Proceedings of the 15th international ACM SIGACCESS conference on computers and accessibility*. 1–8.

[13] Mars Ballantyne, Archit Jha, Anna Jacobsen, J Scott Hawker, and Yasmine N El-Glaly. 2018. Study of accessibility guidelines of mobile applications. In *Proceedings of the 17th international conference on mobile and ubiquitous multimedia*. 305–315.

[14] Jeffrey P Bigham, Jeremy T Brudvik, and Bernie Zhang. 2010. Accessibility by demonstration: enabling end users to guide developers to web accessibility solutions. In *Proceedings of the 12th international ACM SIGACCESS conference on Computers and accessibility*. 35–42.

[15] Jeffrey P Bigham and Patrick Carrington. 2018. Learning from the front: People with disabilities as early adopters of AI. *Proceedings of the 2018 HCIC Human-Computer Interaction Consortium* (2018).

[16] Jeffrey P Bigham, Anna C Cavender, Jeremy T Brudvik, Jacob O Wobbrock, and Richard E Ladner. 2007. WebinSitu: a comparative analysis of blind and sighted browsing behavior. In *Proceedings of the 9th International ACM SIGACCESS Conference on Computers and Accessibility*. 51–58.

[17] Jeffrey P Bigham, Irene Lin, and Saiph Savage. 2017. The Effects of" Not Knowing What You Don't Know" on Web Accessibility for Blind Web Users. In *Proceedings of the 19th international ACM SIGACCESS conference on computers and accessibility*. 101–109.

[18] Yevgen Borodin, Jeffrey P Bigham, Glenn Dausch, and IV Ramakrishnan. 2010. More than meets the eye: a survey of screen-reader browsing strategies. In *Proceedings of the 2010 International Cross Disciplinary Conference on Web Accessibility (W4A)*. 1–10.

[19] Virginia Braun and Victoria Clarke. 2012. *Thematic analysis.* American Psychological Association.

[20] Maria Claudia Buzzi, Marina Buzzi, and Barbara Leporini. 2011. Web 2.0: Twitter and the blind. In *Proceedings of the 9th ACM SIGCHI Italian Chapter International Conference on Computer-Human Interaction: Facing Complexity*. 151–156.

[21] Ben Caldwell, Michael Cooper, Loretta Guarino Reid, Gregg Vanderheiden, Wendy Chisholm, John Slatin, and Jason White. 2008. Web content accessibility guidelines (WCAG) 2.0. *WWW Consortium (W3C)* 290 (2008), 1–34.

[22] Rocio Calvo, Faezeh Seyedarabi, and Andreas Savva. 2016. Beyond web content accessibility guidelines: expert accessibility reviews. In *Proceedings of the 7th international conference on software development and technologies for enhancing accessibility and fighting info-exclusion*. 77–84.

[23] Michael Crystian Nepomuceno Carvalho, Felipe Silva Dias, Aline Grazielle Silva Reis, and André Pimenta Freire. 2018. Accessibility and usability problems encountered on websites and applications in mobile devices by blind and normal-vision users. In *Proceedings of the 33rd Annual ACM symposium on applied computing*. 2022–2029.

[24] Pew Research Center. 2023. *News Platform Fact Sheet.* Retrieved Feb 19, 2024 from https://www.pewresearch.org/journalism/fact-sheet/news-platform-fact-sheet/

[25] Irene Costera Meijer. 2007. The paradox of popularity: How young people experience the news. *Journalism studies* 8, 1 (2007), 96–116.

[26] Motahhare Eslami, Amirhossein Aleyasen, Karrie Karahalios, Kevin Hamilton, and Christian Sandvig. 2015. Feedvis: A path for exploring news feed curation algorithms. In *Proceedings of the 18th acm conference companion on computer supported cooperative work & social computing*. 65–68.

[27] Richard Fletcher and Sora Park. 2017. The impact of trust in the news media on online news consumption and participation. *Digital journalism* 5, 10 (2017), 1281–1299.

[28] Martin Flintham, Christian Karner, Khaled Bachour, Helen Creswick, Neha Gupta, and Stuart Moran. 2018. Falling for fake news: investigating the consumption of news via social media. In *Proceedings of the 2018 CHI conference on human factors in computing systems*. 1–10.

[29] Kentarou Fukuda, Shin Saito, Hironobu Takagi, and Chieko Asakawa. 2005. Proposing new metrics to evaluate web usability for the blind. In *CHI'05 extended abstracts on Human factors in computing systems*. 1387–1390.

[30] P Geetha Rani. 2014. Disparities in earnings and education in India. *Cogent Economics & Finance* 2, 1 (2014), 941510.

[31] Sharad Goel, Jake Hofman, and M Sirer. 2012. Who does what on the web: A large-scale study of browsing behavior. In *Proceedings of the International AAAI Conference on Web and Social Media*, Vol. 6. 130–137.

[32] Meghna Gupta, Devansh Mehta, Anandita Punj, and Indrani Medhi Thies. 2022. Sophistication with Limitation: Understanding Smartphone Usage by Emergent Users in India. In *ACM SIGCAS/SIGCHI Conference on Computing and Sustainable Societies (COMPASS)*. 386–400.

[33] Eszter Hargittai and Gina Walejko. 2008. The participation divide: Content creation and sharing in the digital age. *Information, Community and Society* 11, 2 (2008), 239–256.

[34] Leona Holloway, Matthew Butler, Samuel Reinders, and Kim Marriott. 2020. Non-visual access to graphical information on COVID-19. In *Proceedings of the 22nd International ACM SIGACCESS Conference on Computers and Accessibility*. 1–3.

[35] Mohit Jain, Nirmalendu Diwakar, and Manohar Swaminathan. 2021. Smartphone Usage by Expert Blind Users. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems* (Yokohama, Japan) *(CHI '21)*. Association for Computing Machinery, New York, NY, USA, Article 34, 15 pages. https://doi.org/10.1145/3411764.3445074

[36] Alex Jones. 2009. *Losing the news: The future of the news that feeds democracy.* Oxford University Press.

[37] Shaun K Kane, Chandrika Jayant, Jacob O Wobbrock, and Richard E Ladner. 2009. Freedom to roam: a study of mobile device adoption and accessibility for people with visual and motor disabilities. In *Proceedings of the 11th international ACM SIGACCESS conference on Computers and accessibility*. 115–122.

[38] Abha Khetarpal. 2014. Information and communication technology (ICT) and disability. *Review of market integration* 6, 1 (2014), 96–113.

[39] Shashank Kumar, Jeevitha Shree DV, and Pradipta Biswas. 2021. Comparing ten WCAG tools for accessibility evaluation of websites. *Technology and Disability* 33, 3 (2021), 163–185.

[40] Jonathan Lazar, Aaron Allen, Jason Kleinman, and Chris Malarkey. 2007. What frustrates screen reader users on the web: A study of 100 blind users. *International Journal of human-computer interaction* 22, 3 (2007), 247–269.

[41] Jonathan Lazar, Daniel Goldstein, and Anne Taylor. 2015. *Ensuring digital accessibility through process and policy.* Morgan kaufmann.

[42] Barbara Leporini. 2011. Google news: how user-friendly is it for the blind?. In *Proceedings of the 29th ACM international conference on Design of communication*. 241–248.

[43] Barbara Leporini and Fabio Paternò. 2004. Increasing usability when interacting through screen readers. *Universal access in the information society* 3 (2004), 57–70.

[44] Michael Lipka and Elisa Shearer. 2023. *Audiences are declining for traditional news media in the U.S. – with some exceptions.* Retrieved Feb 19, 2024 from https://www.pewresearch.org/short-reads/2023/11/28/audiences-are-declining-for-traditional-news-media-in-the-us-with-some-exceptions/

[45] Danielle Lottridge, Katie Quehl, Frank Bentley, Max Silverman, Melissa Ong, Michael Dickard, Brooke White, and Ethan Plaut. 2022. Ubiquitous News Experienced Alone: Interviews with Americans and Their Devices. *Proc. ACM Hum.-Comput. Interact.* 6, CSCW1, Article 128 (apr 2022), 29 pages. https://doi.org/10.1145/3512975

[46] Sunny Mannava, Rishi Raj Borah, and BR Shamanna. 2022. Current estimates of the economic burden of blindness and visual impairment in India: A cost of illness study. *Indian Journal of Ophthalmology* 70, 6 (2022), 2141.

[47] Jason A Martin. 2015. Mobile news use and participation in elections: A bridge for the democratic divide? *Mobile Media & Communication* 3, 2 (2015), 230–249.

[48] Aqueasha Martin-Hammond, Ulka Patil, and Barsa Tandukar. 2021. A Case for Making Web Accessibility Guidelines Accessible: Older Adult Content Creators and Web Accessibility Planning. In *Proceedings of the 23rd International ACM SIGACCESS Conference on Computers and Accessibility*. 1–6.

[49] Maxability. 2024. *TOP 10 NEWS WEBSITES IN INDIA AND THEIR ACCESSIBILITY.* Retrieved Feb 19, 2024 from https://www.maxability.co.in/2016/07/31/top-10-

news-websites-in-india-and-their-accessibility/

[50] Logan Molyneux. 2018. Mobile news consumption: A habit of snacking. *Digital journalism* 6, 5 (2018), 634–650.

[51] Meredith Ringel Morris, Annuska Zolyomi, Catherine Yao, Sina Bahram, Jeffrey P Bigham, and Shaun K Kane. 2016. " With most of it being pictures now, I rarely use it" Understanding Twitter's Evolving Accessibility to Blind Users. In *Proceedings of the 2016 CHI conference on human factors in computing systems*. 5506–5516.

[52] Peya Mowar, Tanuja Ganu, and Saikat Guha. 2022. Towards Optimizing OCR for Accessibility. *arXiv preprint arXiv:2206.10254* (2022).

[53] Preeti Mudliar, Jonathan Donner, and William Thies. 2012. Emergent practices around CGNet Swara, voice forum for citizen journalism in rural India. In *Proceedings of the Fifth International Conference on Information and Communication Technologies and Development*. 159–168.

[54] Subhayan Mukerjee. 2021. Online News in India: Appraising the Digital News Consumption Landscape in Theworld's Largest Democracy (2014-2018). (2021).

[55] DAISY Forum of India. 2024. Sugamya Pustakalaya. https://library.daisyindia. org/welcomeLink.action. Retrieved February 10, 2024.

[56] Office of Registrar of Newspapers for India. 2022. Press in India 2021-22. https: //www.rni.nic.in/all_page/PIN2021_22.html Accessed: 2024-07-24.

[57] Changhoon Oh, Jinhan Choi, Sungwoo Lee, SoHyun Park, Daeryong Kim, Jungwoo Song, Dongwhan Kim, Joonhwan Lee, and Bongwon Suh. 2020. Understanding user perception of automated news generation system. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*. 1–13.

[58] Joyojeet Pal, Anandhi Viswanathan, Priyank Chandra, Anisha Nazareth, Vaishnav Kameswaran, Hariharan Subramonyam, Aditya Johri, Mark S Ackerman, and Sile O'Modhrain. 2017. Agency in assistive technology adoption: visual impairment and smartphone use in Bangalore. In *Proceedings of the 2017 CHI conference on human factors in computing systems*. 5929–5940.

[59] Chang Sup Park and Barbara K Kaye. 2020. What's this? Incidental exposure to news on social media, news-finds-me perception, news efficacy, and news consumption. *Mass communication and society* 23, 2 (2020), 157–180.

[60] Christopher Power, André Freire, Helen Petrie, and David Swallow. 2012. Guidelines are only half of the story: accessibility problems encountered by blind users on the web. In *Proceedings of the SIGCHI conference on human factors in computing systems*. 433–442.

[61] Kristen Purcell, Lee Rainie, Amy Mitchell, Tom Rosenstiel, and Kenny Olmstead. 2010. Understanding the participatory news consumer. *Pew Internet and American Life Project* 1 (2010), 19–21.

[62] Cynthia Putnam, Emma J. Rose, and Craig M. MacDonald. 2023. "It could be better. It could be much worse": Understanding Accessibility in User Experience Practice with Implications for Industry and Education. *ACM Trans. Access. Comput.* 16, 1, Article 9 (mar 2023), 25 pages. https://doi.org/10.1145/3575662

[63] Yury Puzis, Yevgen Borodin, Andrii Soviak, Valentyn Melnyk, and IV Ramakrishnan. 2015. Affordable web accessibility: A case for cheaper ARIA. In *Proceedings of the 12th International Web for All Conference*. 1–4.

[64] Ronald E Rice et al. 1984. *The new media: Communication, research, and technology*. SAGE Publications, Incorporated.

[65] André Rodrigues, Kyle Montague, Hugo Nicolau, and Tiago Guerreiro. 2015. Getting Smartphones to Talkback: Understanding the Smartphone Adoption Process of Blind Users. In *Proceedings of the 17th International ACM SIGACCESS Conference on Computers & Accessibility* (Lisbon, Portugal) *(ASSETS '15)*. Association for Computing Machinery, New York, NY, USA, 23–32. https://doi. org/10.1145/2700648.2809842

[66] Michail Salampasis, Christos Kouroupetroglou, and Athanasios Manitsaris. 2005. Semantically enhanced browsing for blind people in the WWW. In *Proceedings of the sixteenth ACM conference on Hypertext and hypermedia*. 32–34.

[67] Yongxin Shi, Dezhi Peng, Wenhui Liao, Zening Lin, Xinhong Chen, Chongyu Liu, Yuyi Zhang, and Lianwen Jin. 2023. Exploring ocr capabilities of gpt-4v (ision): A quantitative and in-depth evaluation. *arXiv preprint arXiv:2310.16809* (2023).

[68] Alexa F Siu, Danyang Fan, Gene SH Kim, Hrishikesh V Rao, Xavier Vazquez, Sile O'Modhrain, and Sean Follmer. 2021. COVID-19 highlights the issues facing blind and visually impaired people in accessing data on the web. In *Proceedings of the 18th International Web for All Conference*. 1–15.

[69] Paul Subhajit and Uttam Kr Pegu. 2021. Media Polarization and Assertion of Majoritarianism in Indian News Media. *The Journal of Communication and Media Studies* 6, 2 (2021).

[70] David Tewksbury. 2003. What do Americans really want to know? Tracking the behavior of news readers on the Internet. *Journal of communication* 53, 4 (2003), 694–710.

[71] David Tewksbury, Michelle L Hals, and Allyson Bibart. 2008. The efficacy of news browsing: The relationship of news consumption style to social and political efficacy. *Journalism & Mass Communication Quarterly* 85, 2 (2008), 257–272.

[72] Emily Thorson. 2008. Changing patterns of news consumption and participation: News recommendation engines. *Information, communication & society* 11, 4 (2008), 473–489.

[73] Benjamin Toff and Ruth A Palmer. 2019. Explaining the gender gap in news avoidance: "News-is-for-men" perceptions and the burdens of caretaking. *Journalism Studies* 20, 11 (2019), 1563–1579.

[74] Markel Vigo, Myriam Arrue, Giorgio Brajnik, Raffaella Lomuscio, and Julio Abascal. 2007. Quantitative metrics for measuring web accessibility. In *Proceedings of the 2007 international cross-disciplinary conference on Web accessibility (W4A)*. 99–107.

[75] Vision Empower. [n. d.]. Vision Empower. https://visionempowertrust.org/. Accessed: 2024-07-24.

[76] Bryan Wang, Gang Li, and Yang Li. 2023. Enabling conversational interaction with mobile ui using large language models. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. 1–17.

[77] Ruolin Wang, Zixuan Chen, Mingrui Ray Zhang, Zhaoheng Li, Zhixiu Liu, Zihan Dang, Chun Yu, and Xiang'Anthony' Chen. 2021. Revamp: Enhancing Accessible Information Seeking Experience of Online Shopping for Blind or Low Vision Users. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. 1–14.

[78] Oscar Westlund. 2008. From mobile phone to mobile device: News consumption on the go. *Canadian Journal of Communication* 33, 3 (2008), 443–464.

[79] Kristin Williams, Taylor Clarke, Steve Gardiner, John Zimmerman, and Anthony Tomasic. 2019. Find and seek: Assessing the impact of table navigation on information look-up with a screen reader. *ACM Transactions on Accessible Computing (TACCESS)* 12, 3 (2019), 1–23.

[80] Shaomei Wu and Lada A Adamic. 2014. Visually impaired users on an online social network. In *Proceedings of the sigchi conference on human factors in computing systems*. 3133–3142.