Original Paper

Exploring Visual Social Media Accessibility for China's Visually Impaired: A Grounded Theory Study of TikTok Usage

Lu Cao[1*]

[1] University of Shanghai for Science and Technology, Shanghai, China

[*] Lu Cao, University of Shanghai for Science and Technology, Shanghai, China

Abstract

This study aims to explore the real-life experiences, challenges, and needs of visually impaired individuals when using visual social media platforms, with TikTok as a case study. The research investigates the accessibility barriers faced by this group and proposes optimization strategies for inclusive design. Adopting a grounded theory methodology, semi-structured interviews were conducted with eight visually impaired participants. The interview transcripts were analyzed through a three-stage coding process, with the core category identified as "Accessibility Challenges in Visual Social Media Usage". The findings reveal four major obstacles encountered by visually impaired users: (1) technical adaptation barriers, (2) contradictions in the information ecosystem, (3) deprivation of digital rights, and (4) delayed response mechanisms. To enhance digital inclusion, this study recommends that platform developers adhere to universal accessibility design principles, while policymakers and society at large should prioritize the digital rights of visually impaired individuals, strengthen policy enforcement, and improve regulatory oversight. These measures can help bridge the digital divide and foster a more inclusive digital society.

Keywords

visually impaired, social media accessibility, grounded theory, digital inclusion, universal design

1. Introduction

In the mobile internet era, digital exclusion of visually impaired populations. The advent of mobile internet has deeply embedded mobile media into the fabric of society. Short-video platforms like TikTok, with their rich audiovisual content, fragmented communication patterns, and integration of local lifestyle services and information, have attracted massive user bases. Within this context, visually impaired individuals face exacerbated challenges in navigating the digital society.

Visual impairment—encompassing both congenital and acquired conditions, including low vision and total blindness—fundamentally limits one's ability to perceive the world visually. In an increasingly visual-dominant media environment, the ongoing digital transformation has further marginalized people with disabilities as a digitally disadvantaged group. Digital accessibility barriers now constitute a critical obstacle to their effective participation in economic and social life (Yang, 2025).

As noted by French visual culture theorist Guy Debord: "In societies where modern conditions of production prevail, life is presented as an immense accumulation of spectacles. All that once was directly lived has become mere representation" (Debord, 2002). This cultural shift from language-centric to image-centric paradigms has established visual information acquisition as the primary mode of comprehending reality (Jin, 2007). Consequently, the phenomenon of "visual hegemony" or "visual primacy" privileges sight-dependent populations in digital environments, exacerbating information inequality among visually impaired communities (Zhang, 2017).

This study investigates the usage patterns of visually impaired individuals in audiovisual media environments, with TikTok as a representative case. As a platform that primarily delivers content through synchronized audio-visual elements rather than traditional text-based formats, TikTok enables visually impaired users to effectively receive and comprehend information via audio components, despite their inability to access visual cues directly. While this media format demonstrates certain communicative advantages and information-processing efficacy for the visually impaired community, it simultaneously presents multiple accessibility barriers, including incompatible functionalities and non-inclusive interface design.

The research aims to: (1) uncover the authentic needs and operational challenges faced by visually impaired users, (2) advocate for greater attention to their digital rights, and (3) catalyze technological and policy improvements in universal design. Such measures are essential to ensure equitable access to digital dividends for people with visual impairments.

2. Method

This study employs in-depth interviews to collect firsthand, rich, and nuanced qualitative data through one-on-one dialogues with participants. Eight visually impaired individuals with relatively representative profiles were selected for semi-structured interviews (Table 1). The interview questions were customized based on participants' individual characteristics, and the questioning techniques were adaptively adjusted to gain profound insights into the lived experiences and needs of visually impaired users when engaging with visual social media platforms (e.g., TikTok).

Table 1. Demographic Profile of Interview Participants with Visual Impairments (N=8)

ID	Gender	Age	Visual Impairment Level	Occupation
H1	Male	22	ow vision	Student
H2	Male	25	Total blindness	Student
H3	Female	24	Total blindness	Student
H4	Female	26	Total blindness	Customer service representative
H5	Female	23	Total blindness	Barista
H6	Male	32	Total blindness	Massage therapist
H7	Male	32	Total blindness	Voice actor
H8	Female	28	ow vision	Piano teacher

3. A Grounded Theory-Based Study

This study applied grounded theory principles to code the interview transcripts, following the procedures of open coding, axial coding, and selective coding. To ensure coding consistency, three coders participated collaboratively throughout the entire coding process. Ultimately, four core concepts and twelve categories were abstracted from the data.

3.1 Open Coding Process

Open coding is an operationalization process that involves "fragmenting" and "deconstructing" collected data, assigning conceptual labels, and then reorganizing the material in novel ways to define concepts and identify categories. During this stage, researchers conduct line-by-line reading of interview transcripts to uncover implicit concepts within the text, which are subsequently categorized (Liu & Jiang, 2015). To minimize personal biases and preconceived theoretical frameworks, the author collaborated with two additional graduate students specializing in communication studies to complete the coding jointly.

3.2 Axial Coding Process

Axial coding primarily serves to identify and establish connections among discrete categories, uncover latent logical relationships between them, and develop both core and subsidiary categories. During this stage, the researcher meticulously analyzed each fundamental category, treating it as an axial point to explore inter-category relationships. Through this process, four core categories were derived: (1) technological adaptation dilemmas, (2) information ecology contradictions, (3) digital rights deprivation, and (4) response mechanism latency.

3.3 Selective Coding Process and Theoretical Integration

Selective coding involves further refinement and conceptual abstraction of the content derived from axial coding, with the aim of identifying a core category that can systematically integrate all other

categories. Through continuous comparative analysis of the original interview transcripts, developed categories, and the four core categories—(1) technological adaptation dilemmas, (2) information ecology contradictions, (3) digital rights deprivation, and (4) response mechanism latency—this study ultimately identified "the accessibility challenges faced by visually impaired individuals in visual-social media usage" as the central phenomenon.

A "storyline" was constructed to delineate all contextual strands and behavioral patterns, elucidating the relationships between the core category and main categories. This process culminated in a theoretical framework, with the specific relational structure presented in Table 2. The final output is "a research model of the influencing mechanisms affecting visually impaired users' accessible engagement with visual-social media platforms", as visually represented in Figure 1.

Table 2. Typical Relational Patterns

| Core Category	Subcategory	Representative Evidence
Technological Adaptation Dilemmas	Dynamic interaction failures, Multimodal conflicts, Assistive technology limitations	TikTok updates causing label malfunctions, OCR recognition errors, Special effects audio drowning out voice descriptions
Information Ecology Contradictions	Algorithmic bias, Credibility filtering, Content conversion loss	70%+ content repetition rate, Cross-platform verification needs, Captions lacking audio synchronization
Digital Rights Deprivation	Educational gaps, Restricted social expression, Policy-practice disconnects	Special education curricula excluding new apps, Disorganized comment section focus, Poor enforcement of accessibility laws
Response Mechanism Latency	Corporate inertia, Standardization absence, Regulatory failures	<20% of user feedback implemented, No dynamic control standards, Exclusion from ESG evaluations
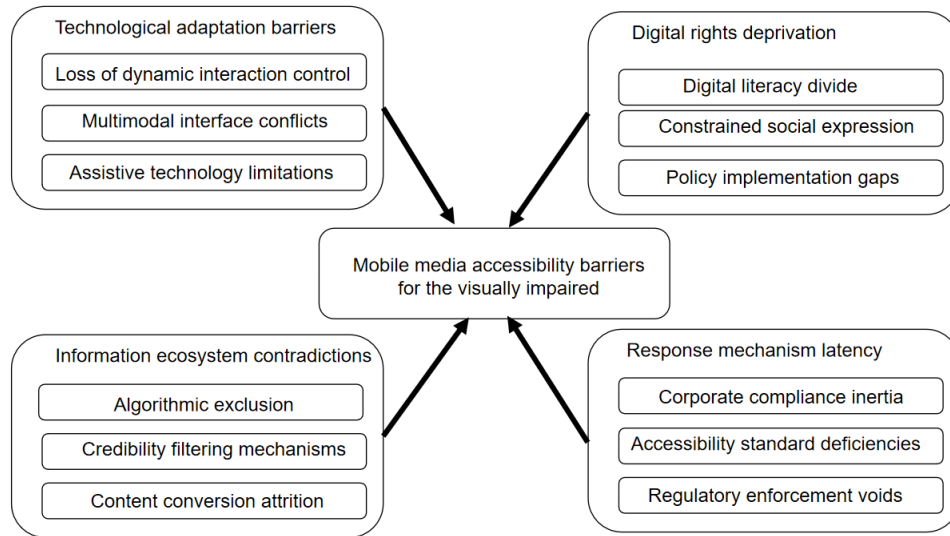
Figure 1. Barrier Model of Visual Social Media Use among the Visually Impaired

3.4 Test of Theoretical Saturation

Theoretical saturation refers to the state in which no new concepts or theoretical insights that could influence the core categories can be extracted from additional interview data or related textual materials. To test for theoretical saturation, the author used the initially developed theory as the benchmark and conducted further interviews with three additional participants. The collected interview transcripts were coded following the same procedures and rules, followed by in-depth analysis and constant comparison. No new concepts affecting the core categories emerged, indicating that the model had achieved theoretical saturation.

4. Discussion: Theoretical and Empirical Insights

"Accessibility" is both a philosophical concept and a guiding principle for social action. The construction of an accessible environment encompasses three key dimensions: accessible infrastructure, barrier-free information exchange, and inclusive social services (Yang, 2021). Accessibility standards address various aspects of human life—including lifestyle, social interaction, and architectural design—imposing requirements that cater to people with disabilities. The ultimate goal is to eliminate social barriers imposed by physical limitations (Yang & Lin, 2023).

At its core, research on accessibility must first address communication barriers between blind and sighted individuals, as their perceptual frameworks differ significantly. Identifying common ground between these two groups is essential for achieving genuine integration in information exchange (Li, 2023).

For visually impaired individuals, mobile media serves both as an assistive tool and a potential cultural field for reconstructing disability cognition—a duality that demands urgent theoretical exploration. With advancements in screen reader technology, visually impaired users can now access digital content through built-in or third-party screen reading applications, enabling their participation in the interconnected world. Crucially, the independent use of mobile media enhances their sense of autonomy and security.

Unlike the predominantly visual metaphors employed by sighted individuals, people with visual impairments typically rely on cross-modal metaphors in linguistic expression, frequently utilizing tactile/auditory metaphors such as "a warm voice" or "a rough relationship". In spatial cognition frameworks, they also tend to adopt egocentric reference systems based on bodily movement trajectories rather than visual cues.

However, despite successfully accessing the digital world, these distinct linguistic characteristics and information processing mechanisms have paradoxically created new challenges for visually impaired users in their online interactions.

4.1 Technological Adaptation Paradox

While TikTok's continuous updates and new features aim to enhance user experience, they frequently create technological adaptation dilemmas for visually impaired users. As one interviewee noted, "After APP updates, existing functions may become inaccessible or malfunction, generating new issues" (H3). This phenomenon not only hinders users' adaptation to new features but also leads to functional regression in certain aspects.

Moreover, the platform's increasingly complex interface design exacerbates usability barriers. Users report persistent problems including: "unreadable product descriptions, missing back buttons, inaudible address/payment information, and erratic focus jumping" (H4). A particularly illustrative case involves the like function: "In standard mode, double-tapping triggers liking, but in screen reader mode, the same gesture activates reader functions—requiring users to first locate the like button before performing a second double-tap" (H3). These issues demonstrate how interface complexity and inaccessible design directly impair operational fluency for visually impaired users.

Mainstream screen reading software still faces significant compatibility challenges. For instance, TianTan Screen Reader exhibits system dependency, with certain functions constrained by Android/iOS permission frameworks. Version updates may further introduce adaptation issues, forcing users to invest substantial time relearning functionalities. As one interviewee stated, "Every screen reader update requires time to re-familiarize with the new features" (H4). This process not only increases cognitive load but also diminishes user engagement with platforms.

iOS's VoiceOver, while offering greater customization flexibility, demonstrates inadequate optimization for many domestic APPs—particularly in accurately labeling complex interfaces like e-commerce

platforms. Users report persistent difficulties: "Overly complicated app interfaces cause screen readers to lag or misread content, especially with security keyboards in financial apps that demand excessive operational time" (H4).

Current screen readers continue to face unresolved challenges in image content recognition and pop-up window interference, with these recurring accessibility failures significantly diminishing user experience for visually impaired individuals. As reported by users: "Suddenly appearing pop-up ads on Tiktok disrupt screen reader functions, forcing me to restart the navigation process from scratch. Each interface redirection requires considerable time to reorient myself" (H5). Another user described: "Some app buttons remain unreadable or trigger unexpected jumps. For instance, when using a shopping app, the 'add to cart' button frequently fails to be vocalized, leaving me to swipe repeatedly hoping to locate it by chance" (H5).

These multimodal conflicts create substantial cognitive and operational burdens, exacerbating digital exclusion for visually impaired users through three key mechanisms: (1) Navigation Disruption: Unpredictable interface changes force complete task restarts. (2) Vocalization Failures: Critical interactive elements remain undetected. (3) Cognitive Overload: Compensatory strategies (e.g., repeated swiping) increase mental fatigue.

4.2 Contradictions in Information Ecosystems

Within digital information ecosystems, visually impaired users face significant contradictions, particularly in the efficiency and quality of content access. Algorithm-recommended videos often exhibit high redundancy, yet unlike sighted users who can filter information through thumbnails and titles, visually impaired individuals must rely solely on audio playback to assess content relevance. As one participant noted, "Many search results are repetitive—I have to listen through to determine if the content meets my needs" (H2).

For the visually impaired community, new media usage extends beyond instrumental needs to encompass socio-psychological demands, including social empowerment (Yang, 2021), economic participation, and identity construction (Yang & Lin, 2023). To obtain diverse information, users are compelled to invest substantial time in compensatory verification processes. This inefficient information acquisition mode not only reduces operational efficiency but also significantly increases cognitive load.

Furthermore, visually impaired users often require multiple attempts to locate desired content during information searches. As respondent H4 described: "Sometimes the search results aren't accurate—I have to try several times before finding what I need" (H4). This phenomenon significantly increases information processing complexity, exposing users to risks of cognitive overload and consequently reducing their platform engagement willingness.

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The current information ecology fails to incorporate precise analyses of visually impaired users' needs. Visual-dominated social media platforms like Tiktok inadequately deliver content aligned with their requirements, consequently constraining their access to valuable information. Visually impaired individuals primarily rely on auditory and tactile channels to process digital media content, depending heavily on audio interpretation for comprehension.

However, inherent contradictions in the existing information ecology create sensory translation barriers, resulting in substantial information conversion loss and inefficient content acquisition. As users report:

"When learning English on Tiktok, subtitles move synchronously with videos. I have to constantly adjust the progress bar to locate unclear segments for screen reader text recognition, significantly increasing usage difficulty" (H3)

"Overly complex video effects with flashing animations make the magnifier function counterproductive—it causes dizziness rather than clarifying key information" (H4)

"Emoji interpretation remains problematic as screen readers vocalize them as code strings, rendering them meaningless" (H8)

4.3 Digital Disenfranchisement

Visually impaired individuals face significant digital disenfranchisement in technological environments, primarily manifested through the lack of essential educational and support resources. As mainstream education systems have long neglected the need for specialized instruction in touchscreen interaction logic, visually impaired users struggle to acquire digital competencies, often forced into arduous self-directed learning.

As one interviewee stated, "No one at school teaches us how to use these applications—we have to figure everything out ourselves" (H8). While new technologies bring promise, they simultaneously create technological alienation, leaving users caught in a digital skill acquisition paradox—desiring connectivity yet lacking institutional pathways to achieve it.

Visually impaired users frequently experience marginalization when accessing information and participating in platform activities. Most platforms fail to provide alternative sensory-channel tutorials or accessible operation guides tailored to their needs. There is a widespread lack of training in touchscreen gesture operations (e.g., double-tapping to "like" or swiping to navigate on Tiktok), leaving users struggling with basic interactions. As one participant explained, "I don't know how to use certain features, and the platform doesn't offer sufficient guidance" (H3).

This exclusion stems from inadequate inclusive design practices, where companies frequently overlook the specific needs of visually impaired individuals when developing products and services. Consequently, their access to digital benefits remains severely restricted. Users report persistent barriers:

(1) "Screen readers can't keep up with live-stream comments—they often vocalize chaotic, overlapping text. Even when I manually scroll up, new comments push me back, making live interaction nearly impossible". (H5)

(2) "I really want to create videos, but every time I reach the 'post' button, I hesitate. I have to proceed extremely carefully to avoid mistakes". (H4)

This systemic lack of support prevents visually impaired individuals from fully realizing their potential on social media platforms, substantially constraining their digital engagement. The prevailing market-oriented approach—which frames disability primarily through a consumer protection lens—has proven inadequate for safeguarding the right to information accessibility in the digital age (Li, 2023).

These participation barriers reveal profound deficiencies in digital education systems regarding inclusive design principles. As a result, the promised empowerment through technology becomes deconstructed when confronted with perceptual differences, exposing a stark disconnect between technological rhetoric and accessible reality.

4.4 Delayed Response Mechanism

A structural contradiction exists between capital logic and accessibility construction, leading to evident corporate inertia in accessibility development and a pronounced imbalance in the cost-benefit ratio of accessible design. For instance, a leading internet company allocates less than 0.3% of its annual R&D budget to accessibility initiatives. This skewed input-output ratio fosters a "minimal compliance" strategy—where platforms technically adhere to regulations while circumventing substantive responsibility, such as adding alt-text tags without ensuring semantic relevance. As one corporate engineer admitted in an interview: "We only need to ensure screen readers can identify major buttons".

The current Web Accessibility Universal Design Guidelines (issued by China's Ministry of Industry and Information Technology) primarily focus on textual readability, leaving dynamic elements (e.g., short videos) largely unregulated (Ministry of Industry and Information Technology). Consequently, companies achieve compliance at minimal cost, yet visually impaired users remain excluded from core functionalities—a phenomenon termed the "compliance trap". One user (H7) reported: "I described the accessibility barriers in detail to customer service, even providing screenshots. They acknowledged the issue and claimed it would be escalated, but no tangible improvements have been made".

While Tiktok Group's 2022–2023 Corporate Social Responsibility Report highlights accessibility features like image-to-text conversion and live-stream captions (Tiktok Group, 2022), it omits critical metrics such as user feedback resolution rates or problem-solving efficiency.

An analysis of 1,237 non-compliant apps flagged by China's Ministry of Industry and Information Technology (MIIT) from 2018 to 2022 reveals that only four cases involved accessibility violations—all receiving disproportionately lighter penalties compared to other infractions. This regulatory bias creates a perverse incentive for corporations to deprioritize accessibility compliance.

Moreover, the ambiguity of accountability enables content platforms to shift responsibility onto assistive technology providers, framing accessibility failures as "screen reader compatibility issues" rather than design deficiencies. This strategic inaction by corporations, coupled with outdated standards and eroding regulatory efficacy, generates a resonance effect that culminates in a "institutional vacuum" for safeguarding the rights of visually impaired users.

5. Conclusion

This study employs grounded theory to conduct an in-depth investigation into the primary challenges faced by visually impaired individuals when using visual-centric social media platforms, particularly TikTok. While the abundance of online resources has alleviated the scarcity of Braille-printed materials, enabling visually impaired users to access needed information through web searches, they nevertheless remain in a disadvantaged position in digital environments. Through in-depth interviews with eight visually impaired participants, the study identifies three critical issues: (1) technological adaptation barriers, (2) contradictions in information ecosystems, and (3) digital rights deprivation. These barriers not only constrain visually impaired users' capacity for digital participation but also significantly impair their information acquisition and user experience.

The findings reveal that while visually impaired users benefit from the conveniences of digital media, they continue to face significant technological and informational barriers, including: Unfriendly interface design, Functional incompatibility and Information redundancy. These challenges stem from platforms' inadequate accessibility design and systematic neglect of visually impaired users' needs, ultimately resulting in the marginalization of this demographic in digital environments.

The proposed measures will contribute to building an equitable digital ecosystem where accessibility is not an afterthought but a fundamental design principle, enabling visually impaired individuals to fully participate in and benefit from digital transformation. Future research should examine the implementation effectiveness of these recommendations across different platform types and user demographics.

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