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Exploring the usability of platforms for individuals with visual impairments: a systematic literature review

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The digital platform's usability is crucial for users but is often overlooked for those with visual impairments. The study aims to review and analyze the usability of platforms for users with visual impairments. The study is a Systematic Literature Review (SLR) that adapts the preferred reporting items for Systematic Reviews and Meta-Analysis (PRISMA) model to review 49 out of 137 publications from 2019 to 2023 indexed in Scopus. Key themes emerging from the analysis include accessibility, navigation, daily activities, screen division layout, and audio guidance. The success of platform implementation is evaluated using the System Usability Scale (SUS), Think Aloud, and Heuristic Evaluation. Building upon the exploration of 49 findings and categorization, a subsequent search is conducted for similar studies that can reinforce the strength of the arguments presented in the 49 studies. The analysis in the study is examined through research questions to provide a comprehensive and in-depth insight into the use of technology to enhance the quality of daily life for users with visual impairment. In addition to evaluating the success of platform implementation and popular evaluation methods, the systematic literature review explores the evolution of assistive technologies over the reviewed period and identifies emerging trends. The study delves into the ethical considerations surrounding developing and implementing technologies catering to individuals with visual impairments. The research aims to contribute not only to the usability aspects but also to the responsible and inclusive advancement of technology for users with visual impairments. In conclusion, this systematic literature review provides a comprehensive overview of the current state of usability in platforms designed for individuals with visual impairments. The findings of this study contribute valuable insights for designers, developers, and policymakers to enhance the inclusivity of platforms for users with visual impairments. Recommendations based on the identified themes aim to guide future research and development, fostering continuous improvement in usability and user experience for this often-neglected user demographic.

KEYWORDS

usability, visual impaired, systematic literature review, assistive technology, accessibility

1 Introduction

Technology is developed to meet human needs in various platforms. The development of platforms represents a form of technological progress where design and planning are always considered to be usable by all types of users. One user group with specific needs is the visually impaired. The World Health Organization (WHO) estimates that there are 2.2 billion visually impaired individuals worldwide in 2023 (World Health Organization, 2023). The use of technology for the visually impaired requires special attention. Using and accessing information from desktop computers, websites, and smartphone applications by disabled people is not an easy task (Shera et al., 2021). This is crucial and needs careful consideration when developing a platform that all user groups can use.

People with disabilities require unique platforms to assist them in fulfilling their daily needs. They can engage in various aspects of life through technology, such as platforms, including communication, mobility, and education. People with impairments use assistive technology to carry out their daily responsibilities and participate fully in society (Mashiata et al., 2022). The platform is a technology that helps the visually impaired perform daily activities efficiently. Information and communications technology (ICT) has played a vital role in supporting people with visual impairments to overcome their issues (Waqar et al., 2019). Without platform technology, visually impaired users would face difficulties in completing daily activities. Therefore, the development of specialized platforms for people with disabilities has many crucial essentials. Researchers have studied the development of platforms for visually impaired users in-depth and proposing solutions to usability issues for the visually impaired.

The study is a Systematic Literature Review (SLR) on the usability of platforms for visually impaired users. The literature review used in the research consists of studies conducted over the past five years, from 2019 to 2023. The study aims to help readers understand the challenges experienced by the visually impaired, the solutions proposed in existing research, the success of platform implementation as assessed by usability evaluation methods, and the evaluation approaches most commonly employed.

The study differs from previous research in that it focuses explicitly on evaluating the usability of platforms for individuals with disabilities. In a systematic literature review conducted by Al-Razgan et al. (2021) titled "A systematic literature review on the usability of mobile applications for visually impaired users," published in PeerJ Computer Science, the researchers focused on addressing the Research Question: "What is the usability of mobile applications for visually impaired users?" The primary Research Objective was to conduct a comprehensive literature review to evaluate the usability of mobile applications designed for individuals with visual impairments. The study aimed to explore how these applications contribute to assisting visually impaired users in their daily activities. The Research findings highlighted that although mobile applications can serve as valuable tools for people with disabilities, particularly in supporting daily activities, usability evaluations revealed notable shortcomings. Visually impaired individuals experienced difficulties in operating text-related functions within these applications. In response to these findings, the researchers proposed a potential solution, suggesting the development of a prototype or a simplified system to address the identified usability challenges.

This study contributes to both researchers and the visually impaired community. The review of scientific articles is essential as they indicate and facilitate the improvement of the current state of research, in addition to providing best practices for learning and delivering new ideas (Mukhiddinov and Kim, 2021). SLR assists researchers in examining the Usability of the Visually Impaired (UVI) research across various platforms, serving as a foundation for development of future studies. For the visually impaired community, the resulting research outputs can enhance quality of life by improving ease of use and time efficiency in daily activities.

2 Survey methodology

The Systematic Literature Review (SLR) uses PRISMA model to gather relevant papers in the field being analyzed. The PRISMA model can be used by authors as a guideline to ensure the completeness of studies and to minimise reporting biases when conducting and reporting systematic reviews and meta-analyses Page et al. (2021). PRISMA support authors in crafting a high-quality systematic review and meta-analysis through a checklist that outlines the essential items to be included and explained. The systematic review of the analysed articles using the PRISMA model guidelines can be seen in Figure 1.

There are also several questions related to the research within the Systematic Literature Review (SLR), which will be shown in Table 1. An in-depth analysis is conducted based on numerous literature sources from the reviewed articles. Relevant questions concerning to the topic are explored, and the answers from the research findings in the reviewed articles are analyzed.

2.1 Research questions

The list of questions in this study is presented in Table 1 format, which includes descriptions and motivations.

2.2 Search strategy

The search strategy involves a systematic analysis and synthesis of studies on the usability of a platform for the visually impaired, considering the user's perspective. This approach encompasses three stages: the planning stage, the conducting stage, and the analyzing stage. According to Pulsiri and Vatananan-Thesenvitz (2018), several stages will guide the reader through the steps and research procedures. These stages will be discussed further in the following section:

2.2.1 Planning stages

In the research planning stage, the process begins with a systematic literature review related to the usability of platforms for visually impaired users. Selected sources include articles indexed in Scopus. The topics of the retrieved articles are relevant to the study of usability platforms for the visually impaired. Keywords are applied to facilitate and refine the search process.

Several keywords are designated to guide the search for focus. First, the keyword "Usability" is used to identify literature discussing the usability aspects of platforms. Additionally, the keyword search was expanded by exploring relevant synonyms for 'visually impaired.'

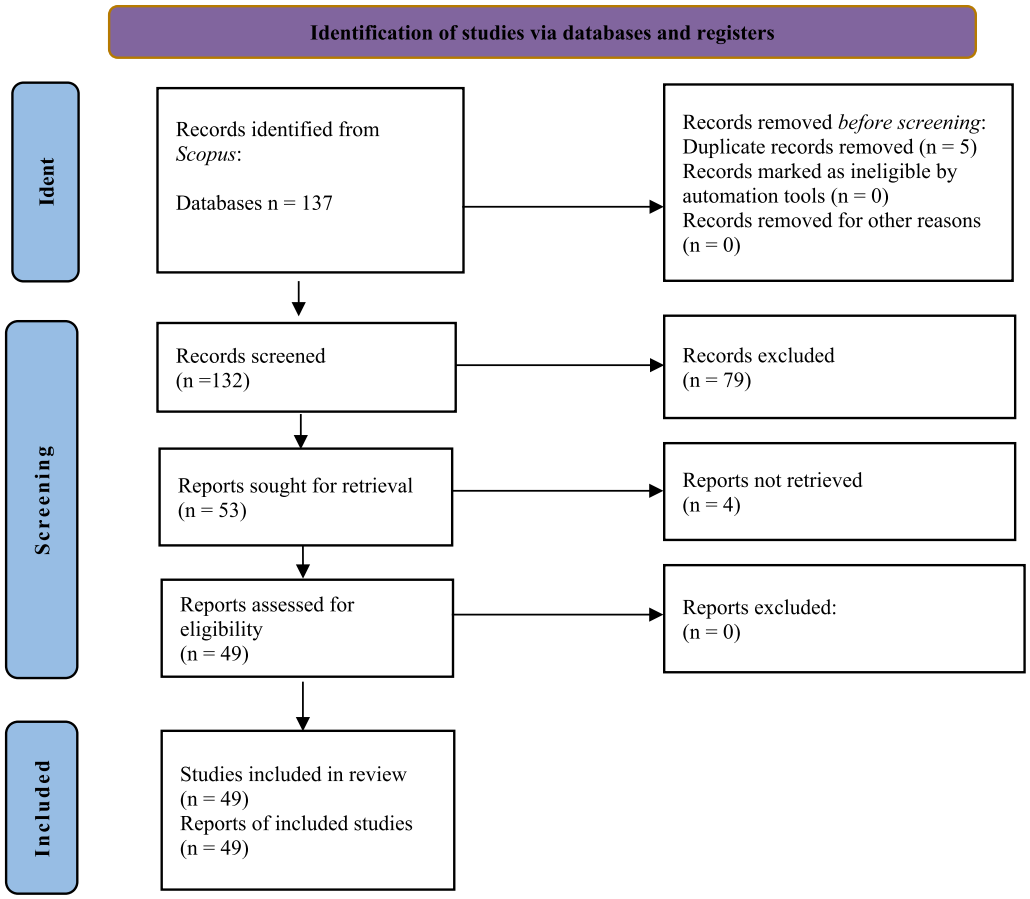

FIGURE 1
PRISMA flow diagram.

TABLE 1 Research questions.

Research questions	Description and motivation
RQ1: How does the success of the implementation of available platforms meet the needs of visually impaired individuals?	The question aims to identify the evaluation of the success level of platform implementation. Through this question, researchers can understand the issues and proposed solutions found in the analyzed literature.
RQ2: What usability evaluation methods for platforms are used on visually impaired individuals?	The question aims to identify the most commonly used methods of evaluation and can assist researchers in determining suitable evaluation methods for future use.
RQ3: Based on the classification study conducted, which platform categories and themes are most effective in assisting visually impaired individuals in their daily lives?	The classification of themes helps researchers understand the most effective platforms for assisting visually impaired individuals and aids in determining the most suitable themes for helping them.

The keywords "Visually impaired" and "Blind" are included to specify literature that specifically discusses users with visual impairments. The scope is expanded with the keyword "Impairment" to ensure that literature addressing visually impaired conditions in general is also covered. Finally, the keyword "Platform" is included to focus the search on platforms explicitly designed to support visually impaired users. Accordingly, the keywords formulated are: ("Usability") AND ("Visually impaired" OR "Blind" OR "Impairment") AND ("Platform").

Through the detailed keyword specification, the aim is to identify and present recent and high-quality literature in a systematic review of the usability of platforms for visually impaired users. An platform that supports data visualization is employed to generate an accurate and comprehensive depiction of the keywords used in the reviewed papers. The VOSviewer application is used to visualize bibliometric networks. VOSviewer is useful tool for displaying or visualizing bibliometric network data. The VOSviewer offers the possibility of building co-occurrence networks of important terms extracted from a corpus of scientific literature using text-mining functionality (Bukar et al., 2023). In addition, VOSviewer is capable of extracting data from various sources such as Web of Science (WoS) and Scopus.

Based on 137 articles on platforms for the visually impaired from Scopus, visualization results through VOSviewer have been obtained,

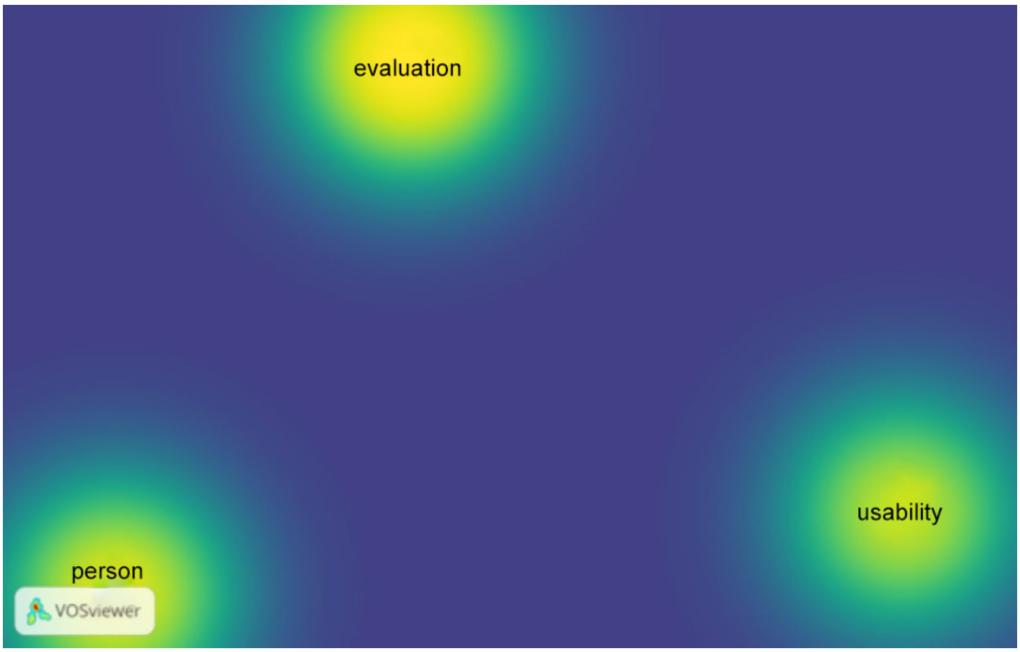

FIGURE 2
Visualization of the popular keyword.

showing the most frequently occurring keywords from the reviewed articles. The obtained visualization results are presented in Figure 2.

From the visualization in Figure 2, it was found that out of 137 articles, the most frequently appearing words are 'evaluation,' followed by 'person,' and then 'usability'. The planning stages consist of two steps: the in-depth review stage and the analysis of findings. The steps taken for the systematic review of related articles must meet the following criteria:

1. The related articles were published between 2017 and 2023.
2. The selected articles are related to the topic of the usability of platforms for the visually impaired.
3. The selected articles are written in English. The researcher's choice of English takes into account the ease of searching for articles and narrows the scope of the literature study conducted.

2.2.2 Conducting stages

The conducting stage is carried out through several steps to obtain relevant articles and avoid duplication. This stage includes exporting and importing citations on the Rayyan website.

2.2.2.1 Exporting papers

The first step is exporting citations. The search is conducted through the Scopus database, a total of 137 papers were found. Due to the high likelihood of articles duplication from downloaded sources, it is necessary to import 137 articles into Rayyan.

2.2.2.2 Importing citation into Rayyan

Rayyan is an online application that aids researchers in systematic review methodology and meta-analysis projects. It allows users to upload citations and full-text articles for a single review or create multiple review projects, even collaborating on publicly available projects (Johnson and Phillips, 2018). After checking using Rayyan, out of the 137 reviewed articles, five were found to have duplications. These five duplications are then removed. From this stage, 132 articles remain. The articles are further filtered based on abstracts, and after reading the articles thoroughly, 79 articles do not meet the title and abstract criteria, and four articles lack complete files. Hence, a total of 49 articles are left and used in the Systematic Literature Review (SLR).

2.2.2.3 Snowballing

Snowballing is a method used in literature reviews. The snowballing technique is known as an efficient and straightforward method. In conducting a literature review through snowballing, relevant articles meeting the research criteria are identified. The references of each paper in parallel forward snowballing by looking at citations (Wnuk and Garrepalli, 2018). The identification process results in 137 articles. Snowballing continues by examining the reference lists to add relevant articles to be included. During this process, irrelevant articles are removed. Articles meeting the criteria are added to the SLR. Out of 137 articles, 49 meet the requirements. Ten articles are added after checking references and considering the possibility of adding other sources, including articles cited in the research. Ten additional studies were added through snowballing, bringing the total number of qualifying studies to 59. It is important to note that this number increased after checking references and considering the possibility of adding other sources, including articles cited in this research. So, it is essential to note that the total number of articles after going through the snowballing stage is 59 articles.

2.2.2.4 Quality assessment

A systematic literature review requires an assessment of quality. The quality of a systematic literature review is determined by the content or substance of the articles included in the review. Therefore, it is crucial to

evaluate these articles carefully. Several scales influence the field of software engineering in assessing the validity of studies. The study applied a strong search strategy to improve the validity of the SLR search process, which was designed using a quasi-gold standard (QGS). By applying this technique, the quality assessment questions are focused and aligned with the research questions mentioned earlier.

In the final step, researchers verified the feasibility of these studies by conducting a quality check for each of the 49 studies. The research considered whether the studies could answer the following questions:

> *RQ1:* How does the success of the implementation of available platforms meet the needs of visually impaired individuals?
>
> *RQ2:* What usability evaluation methods for platforms are used on visually impaired individuals?
>
> *RQ3:* Based on the classification study conducted, which platform categories and themes are most effective in assisting visually impaired individuals in their daily lives?

Through the identification of 49 studies, it was found that all studies met the criteria and could provide answers to the three questions posed.

2.2.3 Analyzing stages

In the analysis stage, data are collected from articles that meet the essential criteria. Subsequently, these articles were distributed to relevant researchers for comprehensive reading and analysis, aiming to identify themes, document the methods used, and make brief summary analyses of the articles. All information analyzed by the researchers was recorded in an Excel spreadsheet.

3 Result

The researchers conducted a systematic literature review based on the provided articles. After completing all the stages outlined in the search strategy section, the researcher proceeded to analyze by thoroughly reading articles. The papers were distributed among the team members. Each researcher thoroughly reviewed their assigned papers and categorized them into themes based on the topics addressed. Several meetings were held to discuss and finalize the thematic classifications collaboratively. Classifications were established based on insights drawn from 49 journal articles that met the criteria outlined in the PRISMA model's identification, screening, and inclusion phases. The classification resulted in five themes, including accessibility, daily activities, navigation, screen division layout, and audio guidance, which were derived from key concerns highlighted in the reviewed papers. The percentage classification of themes for the analyzed articles can be seen in Figure 3. Subsequently, after the classification is carried out on the analyzed articles, the results of the identified themes are presented in Figure 4. In the conducted research, each predetermined theme will be discussed and summarized to report the findings.

3.1 Accessibility

Based on the analysis of 49 articles, 24 articles discuss the theme of accessibility. Accessibility is known as the ease of access to a device

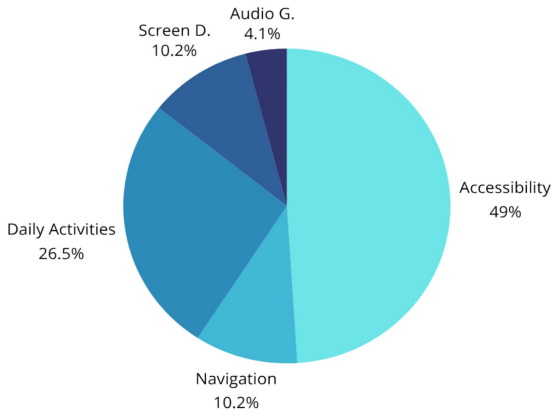

FIGURE 3
Percentages of classification themes.

by various user groups, ranging from regular users to those with special needs, such as the visually impaired group. Three articles provided suggestions for improving accessibility through an increase in the number of participants in usability testing, specifically Nahar et al. (2019b), Alsaeed et al. (2020), and Carvalho et al. (2018). Accessibility is a critical consideration for visually impaired users, necessitating thorough evaluation. For instance, in the case of mBRAILLE, as study by Nahar et al. (2019b), accessibility is identified as a key component within usability assessments. Moreover, various evaluation tools have been employed in the study Alsaeed et al. (2020) to examine accessibility aspects in platforms designed for visually impaired individuals. Four other articles, Brinkley and Tabrizi (2017), Alejandra et al. (2021), Kusumaningayu and Ayu (2017), and Galkute et al. (2020), suggested evaluating and expanding the coverage of other websites used. Aqle et al. (2022), as well as Riazy et al. (2020), focused on providing suggestions related to algorithm evaluation to enhance accessibility. Additionally, several articles focused on the interface and provided recommendations for appropriate accessibility needed for the visually impaired, including Façanha (2019), Mohamad (2018), Nogueira et al. (2017), and Xie et al. (2020). Suggestions related to improving accessibility are also present in articles written by Álvarez Robles et al. (2017), Abdullah (2018), Buzzi (2019), and Chand et al. (2019). Other articles with the theme of accessibility did not provide additional suggestions or recommendations.

3.2 Navigation

Navigation can be defined as the process of determining the direction of movement of an object. Navigation is crucial for the visually impaired, as it allows users to utilize tools with specific techniques to indicate routes and travel locations. The analyzed articles covered both indoor and outdoor navigation. Theodorou (2022) discussed the BlindRouteVision application used for outdoor navigation. BlindRouteVision is an outdoor navigation application with high accuracy, particularly for pedestrian navigation and public transportation. Outdoor navigation is also addressed in Theodorou et al. (2023), with high usability evaluation results through positive user sentiment analysis. Indoor navigation is extensively discussed by Sato et al. (2019) and Nair et al. (2022). For example, the NavCog3

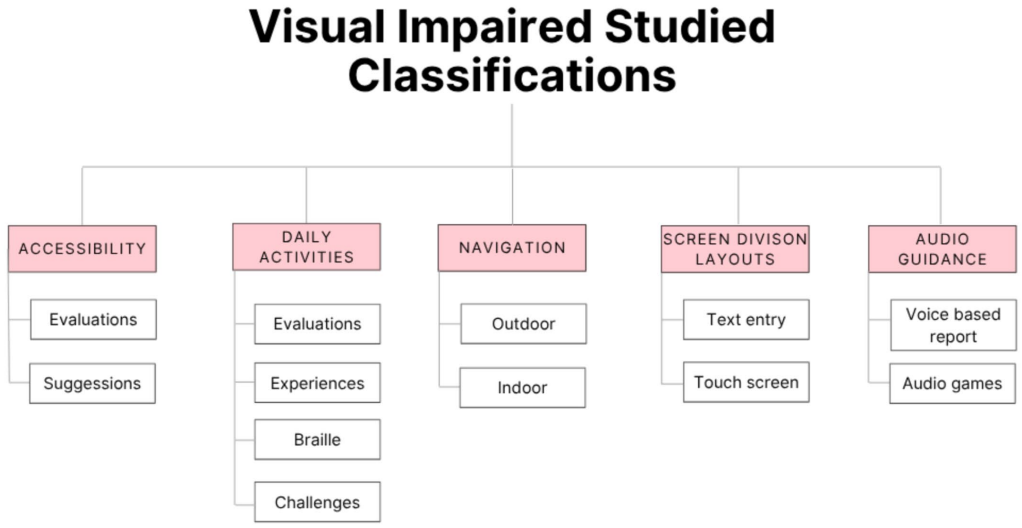

FIGURE 4
Classification of themes from the systematic literature review (SLR).

application by Sato et al. (2019) is an application for the visually impaired with semantic features that have high accuracy and can even be used without assistance. Similarly in Nair et al. (2022), the ASSIST application has received positive feedback based on voice-based performance and user acceptance. Navigation issues are presented in the article Alvarez Robles et al. (2019), which focuses on evaluating the UbicaME system. This article highlights the importance of system functionality, which users need to be aware of. Additionally, issues related to system delays and behavior are highlighted when users are blocked when instructions are given to send their location.

3.3 Daily activities

With technological advances in recent years, visually impaired individuals have utilized mobile platforms for their daily activities. Through the assistance of mobile platforms specifically designed for the visually impaired, they can independently perform activities or tasks without the aid of others. In this category, the author classified the analyzed articles into four groups: evaluation, experience, braille, and challenge. Out of the total 49 reviewed articles, 10 articles fall into the daily activities category. Three articles in the evaluation category include Beal and Rosenblum (2018), Nahar et al. (2019a), and Robles et al. (2019), which provide evaluations of the effectiveness of the design and display of a mobile application used by the visually impaired. Then, there are five articles in the experience category, including Ashok (2017), Antona and Stephanidis (2018), Ferreira et al. (2020), Steverson et al. (2022), João (2020), containing reviews of the experiences of visually impaired individuals in using mobile platforms to complete their daily activities. Nahar et al. (2019a) and Nahar et al. (2022) implemented and evaluated the usability of mobile phone applications that use braille to assist visually impaired people in their daily lives. Furthermore, one article by da Silva Bastos and Muñoz (2017) discusses the challenges and limitations faced by visually impaired individuals when accessing mobile platforms.

3.4 Screen division layouts

Difficulty in identifying and locating nonvisual items on mobile phones or tablets is a significant challenge for the visually impaired. Mistakes in touching items on the screen, whether intentional or unintentional, pose a substantial obstacle for the visually impaired in their daily activities. Out of all the reviewed articles, five articles were found to discuss screen division layouts, which were classified into three categories: text entry and touch screen. Leporini et al. (2018), Khan and Khusro (2022), Alnfiai and Sampali (2017), and Palani (2017) discuss the use of touchscreens on smartphones, devices, or tablets for visually impaired individuals. Additionally, one article by Shabnam and Govindarajan (2017) discusses the implementation of text entry in mobile applications designed for the visually impaired.

3.5 Audio guidance

For visually impaired individuals experiencing difficulty in vision, sound is one of the direct stimuli they can respond to in their daily activities. Through audio assistance, visually impaired individuals can carry out their daily activities by relying on the sounds they hear. Out of the 49 articles we reviewed, two of them discuss the use of audio for mobile platforms specifically designed for the visually impaired. Choi (2022) explains in their research the implementation of audio-based reports on mobile applications intended for visually impaired individuals. Additionally, Araújo et al. (2017) discuss the application of audio game concepts on every mobile platform as an evaluation if the user is visually impaired.

4 Discussion

In this section, an analysis is conducted on the questions that have been posed. Additionally, it discusses the questions that have been raised, allowing the research objectives to be detailed.

> *RQ1:* How does successful the success of the implementation of available platforms meet the needs of visually impaired individuals?

The central inquiry of this study revolves around the success of implementing available platforms to meet the distinctive needs of visually impaired individuals. An analysis of the 49 reviewed articles indicates that platforms evaluated using the established methods exhibited high effectiveness in catering to the needs of individuals with disabilities. However, specific findings revealed areas that require further evaluation to support potential enhancements. Articles emphasizing a high level of effectiveness include Ashok (2017), Theodorou et al. (2023), Façanha (2019), and Ferreira et al. (2020). The usability evaluation results from these studies showcase positive user assessments, with analysis scores consistently indicating commendable outcomes. This suggests that the evaluated platforms exhibit a high level of effectiveness and efficiency in aiding visually impaired individuals in their daily tasks. Notably, Shera et al. (2021) achieved an impressive result of 89.21% using the SUS evaluation method, indicative of elevated user satisfaction and reduced effort for visually impaired individuals in task performance. Similar positive findings are echoed in Antona and Stephanidis (2018) and Oliveira et al. (2018), both obtaining an outstanding score of 90 through the SUS evaluation method, signaling a high level of user satisfaction.

Conversely, platforms identified for future improvements include Nahar et al. (2022), Lee et al. (2021), Power (2018), and Darin et al. (2018). The evaluation results reveal that these platforms currently exhibit lower efficiency and satisfaction levels. For instance, Nahar et al. (2022) report an average satisfaction level of only 4.53. Power (2018) highlights user preferences for more user-friendly features akin to Google, indicating an expectation for similar user experiences in future improvements.

The distinguishing aspect of these findings lies in the nuanced evaluation of both successful and potential areas for improvement among platforms catering to visually impaired individuals. While some platforms showcase high effectiveness and user satisfaction, others present opportunities for refinement to enhance their overall impact. This dual perspective contributes to a comprehensive understanding of the current state of platforms designed for the visually impaired, emphasizing the need for ongoing enhancements and innovation in this critical domain.

> *RQ2:* What usability evaluation methods for platforms are used on visually impaired individuals' platforms?

In exploring the landscape of platforms catering to visually impaired individuals, the focus shifts toward assessing the success of their implementation in meeting the unique needs of this user demographic. Drawing insights from an analysis of relevant research articles, this study illuminates various approaches employed to gauge the efficacy of these platforms. A closer examination of the existing literature reveals a myriad of usability evaluation methods applied to assess the effectiveness of platforms designed for visually impaired users. The exploration includes an in-depth analysis of the most frequently utilized evaluation methods, shedding light on the strengths and limitations of each.

Prominent among these evaluation methods is the System Usability Scale (SUS), recognized for its effectiveness in measuring usability within graphical user interface (GUI) environments (Zwakman et al., 2021). By employing SUS, platforms can be comprehensively evaluated, providing valuable insights into their usability levels based on a predetermined scale. Among the 49 articles analyzed, eleven platforms opted for SUS as their primary evaluation method, indicating its prevalence and relevance.

Beyond SUS, the think-aloud evaluation method emerges as the following frequently utilized approach. This method, involving participants vocalizing their cognitive processes during the interaction, allows for a direct understanding of users' thoughts and emotions (Vanicek Vanicek and Popelka, 2023). Eight articles within the dataset employed the think-aloud method, enriching the evaluation process with user perspectives.

Additionally, Heuristic Evaluation stands out as another method employed by five authors in the analyzed articles. This method involves a small group of evaluators testing platform usability based on predefined aspects, contributing to a structured evaluative process.

In conjunction with these three primary methods, the research also highlights several other innovative usability evaluation approaches, such as semi-structured interviews, interviews combined with observations, and User-Centered Design (UCD). This comprehensive exploration aims not only to analyze the current state of platforms for visually impaired individuals but also to contribute insights that foster advancements in creating more effective and inclusive digital solutions. This research aspires to evaluate and enhance the success of available platforms in meeting the unique needs of visually impaired individuals.

> *RQ3:* Based on the classification study conducted, which platform category and themes are most effective in assisting visually impaired individuals in their daily lives?

Based on the categories of studies classified, platforms with the theme of Audio Guidance, through the research conducted by Choi (2022) Araújo et al. (2017), can be considered the most effective method in assisting visually impaired individuals in their daily activities. This is based on user responses, where individuals with visual impairments express that it is easier for them to interact and respond to the sounds, they hear rather than having to touch or rely on other senses while engaging in activities. While touchscreen technology allows visually impaired users to utilize touch-based interaction, challenges such as restricted screen dimensions continue to persist (Palani, 2017). Similarly, the study by Alnfiai and Sampali (2017) on Braille input methods via keyboards indicated that further design enhancements are necessary to support the ongoing development of accessible keyboards for blind users. Contrary to audio guidance, the study by Choi (2022) found that the sound-based software VTR4VI offers greater ease of use and operability than touchscreen interaction. Through the research conducted, the scientists also reveal that it would be better if every online platform is facilitated with audio guidance, whether in the form of audio games or voice reports.

5 Limitation and future work

The main limitation of this study is related to the methodology used, which focused on 49 articles obtained from Scopus and restricted the search to predefined keywords and strings. This may result in limitations in the number of search results, with the potential of overlooking some

literature. Additionally, excluding a significant number of papers written in other languages could impact the representativeness and completeness of the research results. For future research, it is recommended to broaden the scope of SLR results by considering additional data sources or more online databases. Furthermore, further studies can be conducted to validate SLR results by delving into current usability models for the visually impaired, exploring these models more deeply, and identifying recent developments.

Considering advancements in research related to platforms dedicated to individuals with visual impairments, it would be beneficial to expand the search for studies using multiple sources, not solely relying on one source like Scopus. This would enhance the quality of the research generated. Through the steps taken, starting from searching for studies involving visually impaired users, classifying them into relevant sections, and obtaining literature sources to strengthen the study on the visually impaired using a snowballing method, structured and relevant data can be obtained. It is hoped that the positive contribution of this research to the assessment of challenges and the development of the platform usability for users with visual impairments can be further strengthened.

6 Conclusion

The increasing number of people with visual impairments worldwide has led to the development of various technologies aimed at adapting and assisting the lives of the visually impaired, including platforms. Through the existence of platforms, visually impaired individuals can significantly benefit in solving the daily lives of visually impaired users, especially when the visually impaired users do not have someone to assist them. This research focuses on the analysis of the usability evaluation of platforms. Theme classification is also conducted to facilitate in-depth analysis, identify issues, and find potential solutions. Based on the classification, there are five themes: accessibility, navigation, daily life, audio guidance, and screen division layouts. Researchers found several studies that focus on the accessibility of platforms to ensure that all platforms are accessible to all user groups. Various studies focus on the implementation of platforms that assist in the daily lives of visually impaired users. In the analyzed platforms, several categories were identified, including evaluation, experience, braille, and challenges. Additionally, researchers found studies addressing navigation to assist users in both indoor and outdoor mobility. Research focusing on how audio guidance can help visually impaired individuals complete daily activities through auditory cues was also identified. Through the analyzed articles, the researcher discovered platforms that focus on audio games for visually impaired users. Finally, the researcher found several studies addressing screen division layouts focusing on text entry and touchscreen features that facilitate users with visual impairments. Research analysis was also conducted to identify issues and propose solutions. Evaluation was performed by reviewing the usability of platforms through various selected methods. The three most popular methods include the System Usability Scale (SUS), Think-aloud, and Heuristic Evaluation. Through the paper, the researcher aims to provide a general overview of the issues and highlight the future direction of platform development for the visually impaired.

Data availability statement

The data analyzed in this study is subject to the following licenses/restrictions: the reviewed paper (title of article only). Requests to access these datasets should be directed to Fahrobby Adnan, fahrobby@unej.ac.id; fahrobby@gmail.com.

Author contributions

FA: Writing – review & editing, Supervision, Writing – original draft, Funding acquisition, Formal analysis, Data curation, Conceptualization, Validation, Methodology. JP: Writing – review & editing, Formal analysis, Supervision, Validation, Conceptualization. MA: Investigation, Validation, Supervision, Writing – review & editing. EO: Visualization, Resources, Writing – original draft, Project administration. NR: Visualization, Project administration, Resources, Writing – original draft.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The authors declare that no Gen AI was used in the creation of this manuscript.

Publisher's note

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fcomp.2025.1601621/full#supplementary-material

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