



Dimensions of information search strategies: a study of blind and visually impaired users in mobile digital library environments

Iris Xie, Wonchan Choi, Hyun Seung Lee, Ning Chiao Wang, and Bo Hyun Hong

DOI: <https://doi.org/10.47989/ir31iConf64177>

Abstract

Introduction. This study intends to characterize blind and visually impaired (BVI) users' information search strategies through analysing the dimensions of search tactics and strategies in their interactions with digital libraries (DLs) in the mobile environments.

Method. This study recruited 120 BVI participants representing users of four types of mobile devices: iPhone, iPad, Android phone, and Android tablet. Multiple data collection methods were employed to collect data: prequestionnaires, post-system questionnaires, think-aloud protocols, transaction logs, and post-system and post-search interviews.

Analysis. Qualitative and descriptive analysis were applied to identify dimensions of information search strategies: intentions, actions, and entities. NVivo was used for qualitative analysis. Additionally, inter-coder reliability for the dimensions was calculated.

Results. The initial results of the study identified 13 types of intentions, 14 types of actions, and 15 types of entities. While the intentions encompass cognitive and behavioral goals, the actions focus on access-related activities. The entities range from device/screen readers, DL features/structure, and collections/items. The combination of diverse dimensions constitutes various information search strategies in the mobile DL contexts.

Conclusion. The identified intentions, actions, and entities that constitute search strategies can be further mapped to the unique contexts of BVI users, DL systems, and mobile environments.

Introduction

In information retrieval (IR), tactics refer to discrete moves or actions taken to advance a search, whereas strategies are broader, goal-directed approaches that organize and guide the overall search process (Bates, 1979). This conceptual distinction provides a layered view of users' information-searching behaviors that has informed empirical studies across various IR systems, including online public access catalogs, digital libraries (DLs), and web search engines (Carevic et al., 2018; Jansen et al., 2009; Hoeber & Storie, 2022; Shah & Bender, 2022; Wilson, 1999).

For blind and visually impaired (BVI) users, who rely on screen readers, their tactics, and strategies in mobile DLs are shaped by and executed through the accessibility features of the screen readers and their mobile devices, reflecting resilience and creativity in addressing accessibility and usability challenges (Xie et al., 2025). Since DLs provide digital content in layered structures, involving DL-specific elements such as collections and metadata, they may require distinct tactics and strategies for BVIs users (Xie et al., 2024). To capture the specific characteristics of BVI users' tactics and strategies in the mobile DL context, we extended previous research on dimensions of information search strategies (Belkin et al., 1993, 1995; Chang, 1995), incorporating three dimensions—intention, action, and entity. In this study, we define a tactic as an action associated with an entity, while a strategy is a tactic combined with an intention. As part of a larger project, this paper reports initial findings from a user study guided by the following research question: What are the general and unique types of intentions, actions, and entities that characterize BVI users' information search strategies in the mobile DL context?

Literature review

Types and dimensions of tactics/strategies

Search tactics/strategies identified in the literature on information-searching behavior can be classified into different categories. Research on behavioral category identified observable tactics such as browsing, chaining, monitoring, query reformulation, and starting (Choo et al., 2000; Ellis, 1989; Jansen et al., 2009; Ji et al., 2024; Thatcher, 2008). A cognitive category emphasizes the internal processes and intentions that guided strategy choice, such as reformulating to reduce uncertainty, selecting to judge relevance and trial and error to address knowledge gaps (Barry & Schamber, 1998; Fidel et al., 2004; Kobayashi & Kable, 2024; Kuhlthau, 1991). A contextual category stresses how tactics/strategies were shaped by external conditions, such as consulting colleagues, leveraging institutional resources, and adapting approaches based on organizational affiliations or social networks (Baldwin & Rice, 1997; Barber & Anderson, 2025; Lamb & Kling, 2003; Solomon, 1999; Talja et al., 1999; Williamson, 1998). Finally, a system or interaction category focuses on human-computer interaction, where tactics were inferred from system logs capturing output, click patterns, and dwell time (Han & Wolfram, 2016; He et al., 2016). These works collectively reinforce that information searching is a multidimensional phenomenon, and can be shaped by behavioral patterns, cognitive processes, contextual condition, and system interactions.

Moreover, scholars have conceptualized information-seeking strategies in terms of dimensions that offer structured ways to classify diverse tactics. Belkin et al. (1993) proposed four key dimensions of information-seeking strategies: method of interaction (scanning or searching), goal of interaction (learning or selecting), mode of retrieval (recognition or specification), and resource considered (information or meta-information). This conceptual distinction was further elaborated in later research (Belkin et al., 1995; Huvila, 2010; Kim, 2007, 2009; Shah & Bender, 2022). Cool and Belkin (2002) extended the model with three additional dimensions of interaction: information object, systematicity, and degree. Other researchers developed similar approaches, for example, Chang (1995) outlined four browsing dimensions (purpose, method, domain, and mode), while Xie (2000) introduced two explicit dimensions of information-seeking strategies: methods (acquiring, comparing, consulting, scanning, searching, selecting, tracking, and trial-and-error) and resources

(meta-information, part of an item/specific information, whole item, a series of items/one location, one system/multiple databases, and human). Overall, these studies demonstrate how dimensions provide systematic frameworks for categorizing diverse strategies and tactics in information-seeking.

BVI search tactics/strategies

BVI users employ distinctive tactics shaped by assistive technologies and accessibility barriers, with most studies focusing on web contexts. During the search process, BVI users navigate links and headings, scan for contextual cues, review content, or re-enter search queries with screen readers (Borodin et al., 2010; Jobst, 2009; Lunn et al., 2011; Sahib et al., 2014; Xie et al., 2021a). They often formulate detailed queries to reduce the number of attempts, as additional attempts increase both search time and the likelihood of typos (Sahib et al., 2012; Upadhyay, 2020). To locate and evaluate information, they use tactics such as using web directories and site maps, creating landmarks, skipping sections, and adjusting screen displays (Moreno et al., 2018; Power et al., 2013; Sulong & Yusof, 2024). They also seek assistance from others to understand system features or navigate webpages (Mulliken, 2017; Seyama et al., 2014). Additionally, BVI users often seek alternative pathways or avoid inaccessible content altogether (Vigo & Harper, 2013; Xie et al., 2021b). BVI users often seek alternative pathways or avoid inaccessible content altogether (Vigo & Harper, 2013; Xie et al., 2021b).

Studies of mobile platforms for BVI users reveal similar tactics (e.g., seeking assistance from others, navigating links and headings), but most have emphasized usability and accessibility testing. As a result, identified tactics/strategies are often framed as troubleshooting behaviors in response to mobile-specific barriers. For example, focusing on websites and search engines, mobile screen reader interactions highlight some tactics, such as relying on sighted individuals or artificial intelligence-powered apps, consulting multiple external sources or tutorials, and strategies, such as switching activation modes, navigating at different semantic levels to solve issues (Jordan et al., 2024; Zhao et al., 2024).

While these findings underscore BVI users' resilience in overcoming accessibility challenges, little attention has been devoted to the dimensions of search tactics/strategies in the mobile DL contexts. This gap is significant since mobile DL environments have unique constraints, such as limited screen real estate, gesture-based navigation, and reduced information visibility, that affect BVI users' search behaviors. Therefore, it is critical to identify unique BVI users' search behaviors in the mobile DL environments and recommend DL design improvements to support BVI users. To bridge the gap, we developed a multifaceted, user-centered framework to investigate how BVI users apply their search tactics/strategies in using mobile DLs.

Method

Participants

This study was approved by the Institutional Review Board at a state university. The recruitment flyer was distributed through online on different communities and organizations associated with BVI users such as the National Federation of the Blind. Additionally, snowball sampling was used to identify participants that meet inclusion criteria for this study.

	Category	N
Age	18–29	29
	30–39	41
	40–49	27
	50–59	13
	>59	10
Gender	Female	60
	Male	59
	Non-binary	1
Vision condition	Blind	80
	Visually impaired	40

Table 1. Demographic information of participants (N = 120).

Participants must be 18 or older, use a screen reader to interact with mobile devices, have at least three years of mobile search experience, be able to communicate in English, and be willing to install Microsoft Teams on their devices. This study recruited 120 BVI participants representing users of four different types of mobile devices: iPhone, iPad, Android phone, and Android tablet (Table 1). Each group consists of 30 BVI participants using the default screen reader of their devices: VoiceOver (iPhone and iPad) and TalkBack (Android phone and tablet).

Data collection

Multiple data collection methods were employed (Figure 1). The pre-questionnaire collected participants' demographic backgrounds, information resources use, and their experiences with DLs. Participants were instructed to perform three tasks for each DL: orientation, specific and subject search tasks. The Think-aloud protocols and transaction logs were recorded to capture participants' verbalizations, screen interactions, and search transactions, which serve as the primary data for this study. The post-system questionnaires and interviews collected participants' perception of accessibility, usability, their experience with the DL during the task. The post-search interview captured their final assessment of the two DLs. Six different DLs were selected to represent diverse domains, formats, and types: Library of Congress Digital Collections (LoC), Digital Public Library of America, HathiTrust, ArtStor, OER Commons, and the National Museum of African American History and Culture. Each participant was assigned to two DLs, with one being LoC.

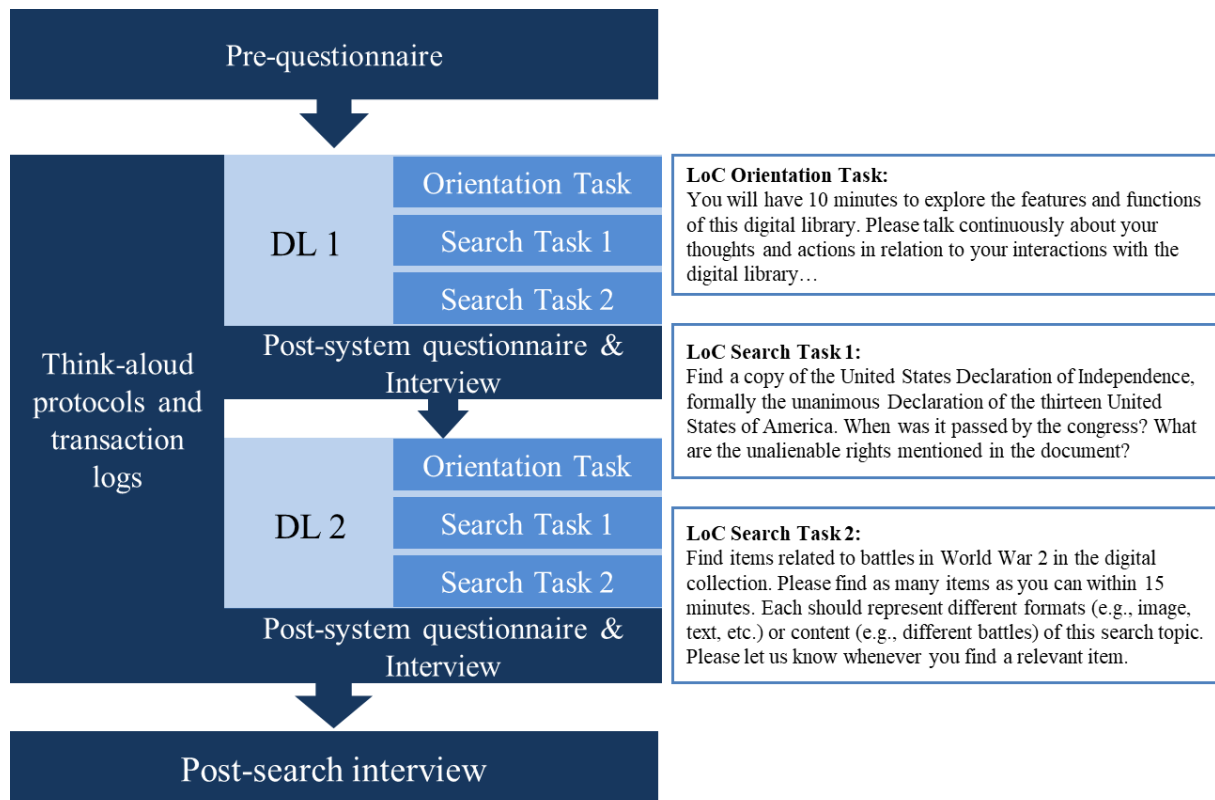


Figure 1. Data collection and procedure.

Analysis

Open coding, which is utilized for capturing meaningful concepts within unstructured data (Flick, 2018), was applied to analyze transcripts obtained from think-aloud protocols and transaction logs, identifying the text related to search strategies as codes. The search strategy is comprised of a search tactic (action and its associated entities) and an intention (with its associated entity). Unique search strategies were also identified. A search strategy is considered unique if it is specific to BVI users in mobile DL contexts when compared with general users.

Upon completion of collection and transcript preparation, three coders participated in the open coding process using NVIVO 15, a qualitative analysis software. The coding scheme is presented in the Results section to avoid repetition (Figure 2 and 3). Inter-coder reliability was 0.833 using Krippendorff's Alpha (Krippendorff, 2004; Marzi et al., 2024), indicating overall satisfactory level of agreement.

Results

Dimensions of information search strategies

This study identified dimensions of information search strategies, and intentions, actions, and entities are bolded, italicized, and underlined respectively in this section. Figure 2 presents thirteen types of intention identified during their interactions with DLs: **Access**, **Avoidance**, **Evaluation**, **Exploration**, **Finding**, **Formulation**, **Identification**, **Learning**, **Locating**, **Modification**, **Recall**, **Reformulation**, and **Resolution**. Fourteen types of action applied by BVI users are illustrated in Figure 3 reports *Activate*, *Adjust*, *Ask*, *Browse*, *Create*, *Examine*, *Guess*, *Navigate*, *Open*, *Reload*, *Return*, *Revise*, *Skim*, and *Trial and error*. Fifteen types of entities were identified including *Collection*, *Feature*, *Format*, *Human*, *Image*, *Information*, *IR System*, *Item*, *Metadata*, *Mobile/Screen*

reader, Outcome, Page/structure, Query, Topic, and Voice assistant, each representing a specific object or aspect BVI users interacted with DLs.

Types of Intentions	Access	Get access to an item, collection, or image
	Avoidance	Keep away from a negative outcome or harmful situation
	Evaluation	Assess the relevance and usefulness of items, search results or features
	Exploration	Investigate availability or functionality of items, collections or features
	Finding	Look for or seeking information, items or features
	Formulation	Converting users' underlying information needs to a search statement
	Identification	Recognize specific elements within a given entity, a page, or a situation
	Learning	Gain knowledge of system features, system structure, domain knowledge, and database content
	Locating	Situate to a specific position of/location of information, items or features
	Modification	Make a change or improve to make features, setting, or mode more suitable for a specific purpose
	Recall	Remember information during their search task
	Reformulation	Alter search query by rephrasing or refining for relevant results
	Resolution	Find solutions to or figure out ways to solve encountered issue or situation

Figure 2. Types of intentions.

Types of Actions	Activate	Executing a feature or an interactive element
	Adjust	Changing between modes or settings
	Ask	Seeking help or assistance
	Browse	Looking through structure, categories, or feature casually
	Create	Composing a search query
	Examine	Surveying content of an item or a collection carefully
	Guess	Estimating based on the system's feedback or the outcome
	Navigate	Moving across various elements of a page
	Open	Tapping an item or a collection
	Reload	Resetting a page
	Return	Going back to a previous page, a previous condition, situation, or action
	Revise	Rephrasing, refining, or correcting queries
	Skim	Looking through a list of items or collections quickly
	Trial and error	Engaging in exploratory or experimental interactions with an interactive element or a feature

Figure 3. Types of actions.

Figures 4, 5, and 6 present each dimension corresponding to general and unique strategies within the overall strategies utilized.

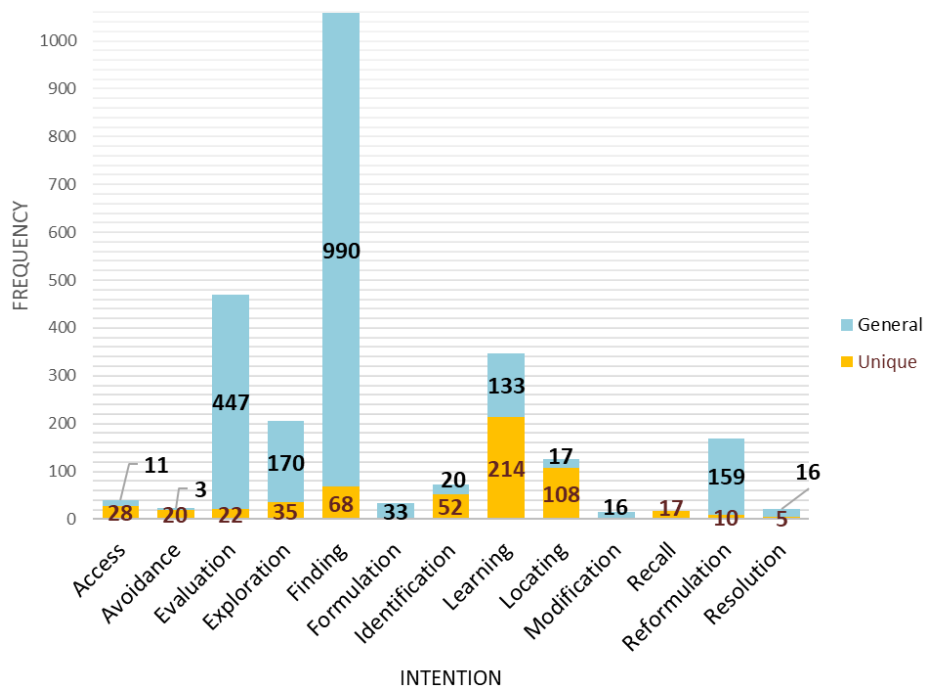


Figure 4. Frequency of intentions.

Within the overall strategies, the most frequently identified intentions include **Finding** (n=1058, 40.8%), **Evaluation** (n=469, 18.1%), **Learning** (n=347, 13.4%), and **Exploration** (n=205, 7.9%). Compared to the general intentions, **Avoidance**, **Access**, **Identification**, **Learning**, **Locating**, and **Recall** were shown to be highly associated with unique search strategies (Figure 4). For actions, **Skim** (n=409, 15.8%), **Examine** (n=377, 14.5%), **Open** (n=310, 12.0%), **Create** (n=263, 10.1%), **Navigate** (n=180, 6.9%), and **Trial and error** (n=174, 6.7%) were employed frequently throughout their interaction with DLs. The proportions of **Adjust** and **Navigate** were higher within unique search strategies compared to other types of action (Figure 5). In terms of entity, participants interacted with **Item** (n=1573, 30.3%), **Page/structure** (n=1189, 22.9%), **Query** (n=691, 13.3%), **Feature** (n=684, 13.2%), and **Collection** (n=514, 9.9%) most frequently during their interaction. Notably, **Format**, **Mobile/Screen reader**, and **Image** were more prevalent in the unique search strategies.

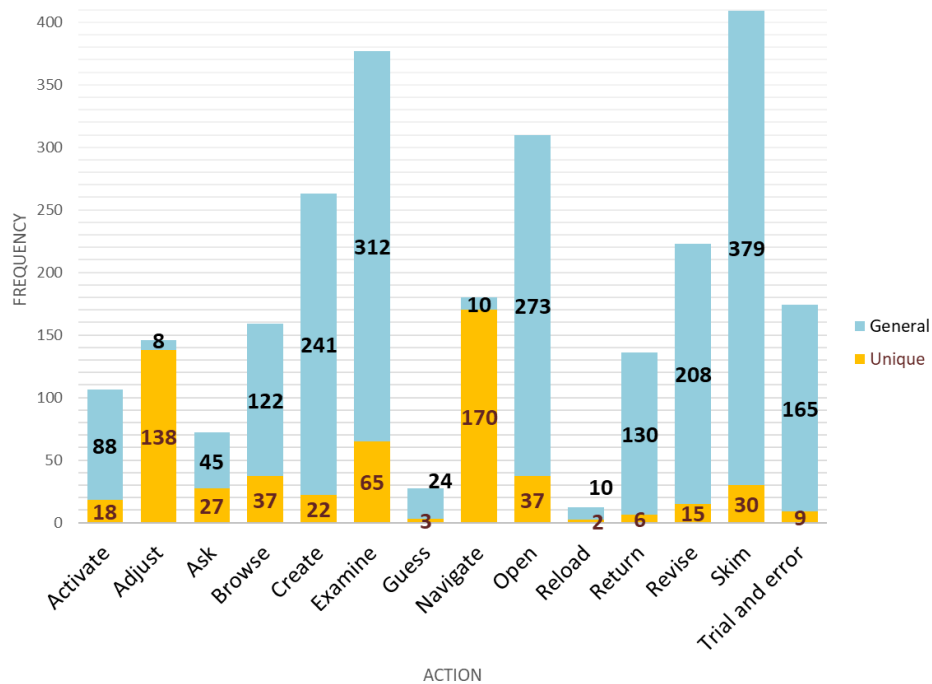


Figure 5. Frequency of actions.

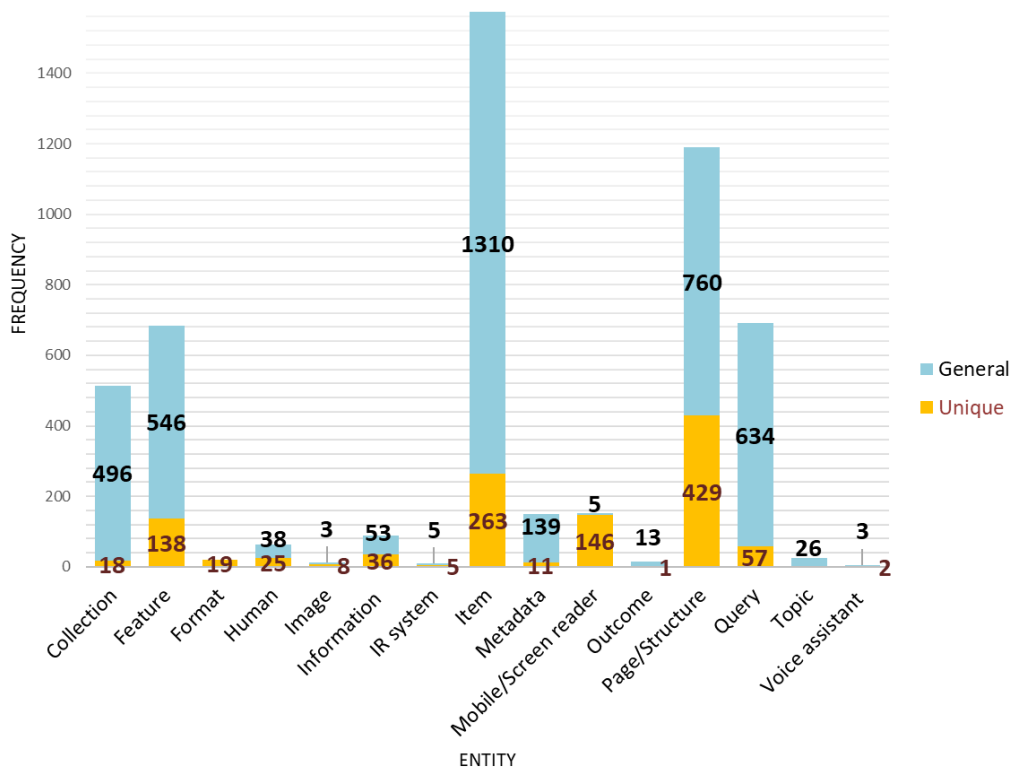


Figure 6. Frequency of entities.

Examples of unique information search strategies

Figure 7 presents the dimensions of unique information search strategies. The following examples illustrate some of the representative unique search strategies including search tactics (actions plus entities) with associated intentions and entities identified in the study.

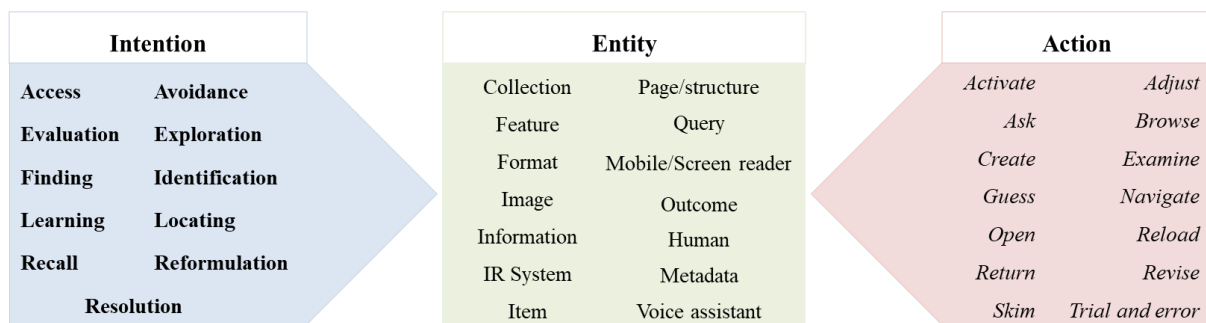


Figure 7. Dimensions of unique search strategies.

Activate a feature to access an image. Gaining Access to inaccessible images involves using an ‘Activate a feature’ tactic to support understanding of the image content. For instance, the ‘describe image’ function was used by participants to access the image: ‘... **I’m encountering some things that are not labelled or... They’re not saying anything**, so this whatever I’m my focus is on, so I’m gonna tap once with three fingers and go over to ‘describe image’ (AT2-DL).’

Adjust screen reader to locate a feature. Before initiating a search, some participants utilized ‘Adjust a screen reader’ tactic to pinpoint the location of the search field. By changing their screen reader setting, they were able to directly situate themselves at the existing form field within a page: ‘Alright, let’s see. [Adjusting the rotor to ‘Form control’] ... **I’m looking to see if there is a search if there’s a search box that I can type into** (ID2-DL).’

Navigate a page to learn page structure. Learning the structure, content and features is essential for BVI users to navigate and interact with DLs. To illustrate, the ‘Navigate a page’ tactic was employed to learn the page layout and organization of information: ‘Currently I’m not doing anything, just flicking right and sometimes left, just if I wanna make sure ... **trying to understand the relationship of the layout. You know the links, the buttons and what have you, so just trying to understand how they are grouped** (AP14-OL).’

Skim collections to avoid images. Avoidance of image is associated with participants’ efforts to reduce potential challenges or inefficiencies. For example, the ‘Skim collections’ tactic was employed to minimize engagement with collections with potentially inaccessible items: “I think this collection would have information about the battles, **but it’s gonna be a lot of images**. So, if I was looking for information about battles, **it would probably not be one that I would choose** ... I mean it says it’s a collection of maps, so it’s gonna be images. But I would go past that (AP13-LO).’

Discussion

Most search tactics/strategies research has been at the macro level, while they are useful in either characterizing as types or categories of search tactics/strategies applied by general users (Choo et al., 2000; Ellis, 1989; Kuhlthau, 1991; Late et al., 2024; Liu, 2021), these works are limited to provide insight related to BVI users’ search patterns. BVI users exhibit unique search tactics/strategies compared with general users (Jordan et al., 2024; Moreno et al., 2018; Mulliken, 2017; Sulong & Yusof, 2024; Vigo & Harper, 2013; Zhao et al., 2024) as they rely on the non-visual and sequential interaction approaches. However, it is challenging to accurately represent these unique approaches just using labels.

Extending the earlier multidimensional frameworks including intentions, methods, entities, and resources (Belkin et al., 1993, 1995; Chang, 1995; Cool & Belkin, 2002; Shah & Bender, 2022; Xie, 2000), the findings of this study portray the unique intentions, actions, and entities that constitute BVI users’ information search strategies in the mobile DL environment, the identified intentions can be mapped to the unique contexts of BVI users, DL systems and mobile environments,

reflecting how these dimensions intersect in search behaviors. Several intentions are particularly BVI-related, such as *Access*, *Avoidance*, *Identification*, *Learning*, and *Recall*. These intentions are associated with accessibility needs. For example, 'Access' reflects the need to open materials that are screen-reader compatible and meaningful to BVI users, while 'Avoidance' shows the efforts to bypass inaccessible content, features, or complex navigation pathways. 'Identification,' and 'Recall' further demonstrate the cognitive and procedural strategies required to manage spatial orientation and memory to fulfil information search tasks.

DL-related-intentions consist of *evaluation*, *finding*, *formulation*, *learning*, *modification*, *reformulation*, and *resolution*. Although some labels of these intentions are similar to intentions related to other types of IR systems, they do reflect BVI users' unique interactions with DL structures and functionalities, such as assessing the relevance of metadata of retrieved items. Mobile-related-intentions include *Exploration* and *Locating*. The smaller screen size and touch-based navigation require exploration and adjustment of settings or approaches to find relevant information.

Simultaneously, the analysis of actions also demonstrates how BVI users, DL systems, and mobile environments can define information search strategies. BVI-specific-actions, such as *Guess*, *Navigate*, and *Trial and error* reflect the need to explore interfaces sequentially, speculate the function of unfamiliar features/elements, adapt interaction approaches, and recover from errors. Additionally, *Reload* and *Return* further call for the need to manage status or revisit previous pages during the search process.

DL-specific-actions cover *create*, *revise*, *examine*, and *skim* and they represent specific engagement with DLs, from composing and modifying queries to evaluating metadata and scanning result lists. Mobile-specific-actions, such as *Activate*, *Adjust*, and *Open*, highlight the unique challenges of small-screen navigation and touch gestures.

Finally, the entities engaged by BVI users, mobile interfaces, and DL systems is another dimension of information search strategies. In BVI-specific contexts, entities such as *Feature*, *Format* and *Page/Structure* play the key roles because users depend on accessible formats, screen reader compatibility, and structural organization for effective navigation and retrieval.

In DL environments, entities such as *collection* and *metadata*, stress the complicated DL systems with hierarchical structure and diverse levels of content in which users interact in the search processes. In mobile contexts, small-screen, touch-based interfaces and gestures, and voice-driven commands determine their unique entities like *Mobile/screen reader* and *Voice assistance*.

Even though some of the identified intentions (e.g., *identification*, *evaluation*), actions (e.g., *skim*, *trial and error*), and entities (e.g., *item*, *query*) are similar as general ones (Belkin et al., 1993, 1995; Chang, 1995; Kim, 2007, 2009), their underlying intentions, factors, and constraints differ in BVI contexts. Unique intentions (e.g., *Avoidance*, *Recall*), actions (e.g., *adjust*, *guess*) and entities (e.g., *format*, *screen reader*) corresponding to BVI users, DL systems and mobile contexts were also specified. These findings highlight not only what differs from general users but why these differences arise. Most importantly, this study demonstrates search tactics/strategies applied by BVI users cannot be defined at only one dimension. By mapping these intentions, actions, and entities to specific contexts, this framework illustrates how user characteristics, IR system types, and device environments jointly characterize information search strategies.

Conclusion

This study identified 13 types of intentions, 14 types of actions, and 15 types of entities that characterize the unique aspects of BVI users' tactics/strategies in mobile DL search tasks. This study contributes to IR research by offering a multidimensional, micro-level framework that dissects BVI users' search behavior into what they do (actions), why they do it (intentions), and

what system components they engage with (entities), enabling a more precise representation of their tactics/strategies in mobile DL environments.

Future work will identify patterns between intentions and search tactics, examine tactic transitions, and compare strategies across different DLs and mobile devices. The dimensional approach introduced in this study will enable the detection of both common and unique configurations of the three components (intentions, actions, and entities) that correspond to specific accessibility and usability issues when DLs are accessed through various mobile devices. These insights can inform the design of DLs and other IR systems on mobile platforms by identifying where and how system features, content, and structures can be better aligned with BVI users' actions and provide stronger support for their underlying intentions.

Acknowledgements

The authors thank IMLS Leadership Grants for Libraries (LG-252289-OLS-22) for funding for this project.

About the authors

Iris Xie is a professor at the School of Information Studies, University of Wisconsin-Milwaukee. She can be contacted at: hiris@uwm.edu

Wonchan Choi is an associate professor at the School of Information Studies, University of Wisconsin-Milwaukee. He can be contacted at: wchoi@uwm.edu

Hyun Seung Lee is a PhD student at the School of Information Studies, University of Wisconsin-Milwaukee. She can be contacted at: lee649@uwm.edu

Ning Chiao Wang is a PhD student at the School of Information Studies, University of Wisconsin-Milwaukee. She can be contacted at: wang424@uwm.edu

Bo Hyun Hong is a PhD student at the School of Information Studies, University of Wisconsin-Milwaukee. She can be contacted at: hongb@uwm.edu

References

- Baldwin, N. S., & Rice, R. E. (1997). Information-seeking behavior of securities analysts: Individual and institutional influences, information sources and channels, and outcomes. *Journal of the American Society for Information Science*, 48(8), 674-693. [https://doi.org/10.1002/\(SICI\)1097-4571\(199708\)48:8<674::AID-ASI2>3.0.CO;2-P](https://doi.org/10.1002/(SICI)1097-4571(199708)48:8<674::AID-ASI2>3.0.CO;2-P)
- Barber, L. D., & Anderson, P. J. (2025). Understanding first-year university student information seeking through the theory of planned behaviour: A transnational perspective. *The Journal of Academic Librarianship*, 51(5), 103096. <https://doi.org/10.1016/j.acalib.2025.103096>
- Barry, C. L., & Schamber, L. (1998). Users' criteria for relevance evaluation: A cross-situational comparison. *Information Processing & Management*, 34(2-3), 219-236. [https://doi.org/10.1016/S0306-4573\(97\)00078-2](https://doi.org/10.1016/S0306-4573(97)00078-2)
- Bates, M. J. (1979). Information search tactics. *Journal of the American Society for information Science*, 30(4), 205-214. <https://doi.org/10.1002/asi.4630300406>

- Belkin, N. J., Cool, C., Stein, A., & Thiel, U. (1995). Cases, scripts, and information-seeking strategies: On the design of interactive information retrieval systems. *Expert Systems with Applications*, 9(3), 379–395. [https://doi.org/10.1016/0957-4174\(95\)00011-W](https://doi.org/10.1016/0957-4174(95)00011-W)
- Belkin, N. J., Marchetti, P. G., & Cool, C. (1993). BRAQUE: Design of an interface to support user interaction in information retrieval. *Information processing & management*, 29(3), 325–344. [https://doi.org/10.1016/0306-4573\(93\)90059-M](https://doi.org/10.1016/0306-4573(93)90059-M)
- Borodin, Y., Bigham, J. P., Dausch, G., & Ramakrishnan, I. V. (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. <https://doi.org/10.1145/1805986.1806005>
- Carevic, Z., Lusky, M., van Hoek, W., & Mayr, P. (2018). Investigating exploratory search activities based on the stratagem level in digital libraries. *International Journal on Digital Libraries*, 19(2), 231–251. <https://doi.org/10.1007/s00799-017-0226-6>
- Chang, S. J. L. (1995). *Toward a multidimensional framework for understanding browsing*. Rutgers The State University of New Jersey, School of Graduate Studies.
- Choo, C. W., Detlor, B., & Turnbull, D. (2000). Models of information seeking on the World Wide Web. In *Web Work: Information Seeking and Knowledge Work on the World Wide Web*, 133–158. Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-94-015-9405-9_5
- Cool, C., & Belkin, N. J. (2002). A classification of interactions with information. In *Proceedings of the Fourth International Conference on Conceptions of Library and Information Science*, 1–15. Greenwood Village: Libraries Unlimited.
- Ellis, D. (1989). A behavioural approach to information retrieval system design. *Journal of Documentation*, 45(3), 171–212. <https://doi.org/10.1108/eb026843>
- Fidel, R., Mark Pejtersen, A., Cleal, B., & Bruce, H. (2004). A multidimensional approach to the study of human-information interaction: A case study of collaborative information retrieval. *Journal of the American Society for Information Science*, 55(11), 939–953. <https://doi.org/10.1002/asi.20041>
- Flick, U. (2018). *An introduction to qualitative research*. Sage.
- Han, H., & Wolfram, D. (2016). An exploration of search session patterns in an image-based digital library. *Journal of Information Science*, 42(4), 477–491. <https://doi.org/10.1177/016555151559895>
- He, J., Qvarfordt, P., Halvey, M., & Golovchinsky, G. (2016). Beyond actions: Exploring the discovery of tactics from user logs. *Information Processing & Management*, 52(6), 1200–1226. <https://doi.org/10.1016/j.ipm.2016.05.007>
- Hoeber, O., & Storie, D. (2022). Information seeking within academic digital libraries: a survey of graduate student search strategies. In *Proceedings of the 22nd ACM/IEEE joint conference on digital libraries*, 1–5. <https://doi.org/10.1145/3529372.3533286>
- Huvila, I. (2010). The Cool and Belkin faceted classification of information interactions revisited. *Information Research: An International Electronic Journal*, 15(4), 4. <https://informationr.net/ir/15-4/colis724.html>
- Jansen, B. J., Booth, D. L., & Spink, A. (2009). Patterns of query reformulation during web searching. *Journal of the American Society for Information Science*, 60(7), 1358–1371. <https://doi.org/10.1002/asi.21071>

- Ji, K., Hettiachchi, D., Salim, F. D., Scholer, F., & Spina, D. (2024). Characterizing information seeking processes with multiple physiological signals. In Proceedings of the 47th International ACM SIGIR Conference on Research and Development in Information Retrieval, 1006-1017. <https://doi.org/10.1145/3626772.3657793>
- Jobst, J. E. (2009). An exploratory study of screen-reader users navigating the web. [Doctoral dissertation, The University of Texas at Austin]. <http://hdl.handle.net/2152/29611>
- Jordan, J. B., Van Hyning, V., Jones, M. A., Bradley Montgomery, R., Bottner, E., & Tansil, E. (2024). Information Wayfinding of Screen Reader Users: Five Personas to Expand Conceptualizations of User Experiences. In Proceedings of the 26th International ACM SIGACCESS Conference on Computers and Accessibility, 1-7. <https://doi.org/10.1145/3663548.3688539>
- Kim, J. (2007). Modeling task-based information seeking on the web: Application of information seeking strategy schema. In Proceedings of the Journal of the American Society for Information Science, 44(1), 1-13. <https://doi.org/10.1002/meet.1450440239>
- Kim, J. (2009). Describing and predicting information-seeking behavior on the web. Journal of the American Society for Information Science, 60(4), 679-693. <https://doi.org/10.1002/asi.21035>
- Kobayashi, K., & Kable, J. W. (2024). Neural mechanisms of information seeking. Neuron, 112(11), 1741-1756. <https://doi.org/10.1016/j.neuron.2024.04.008>
- Krippendorff, K. (2004). Reliability in content analysis: Some common misconceptions and recommendations. Human communication research, 30(3), <https://doi.org/10.1111/j.1468-2958.2004.tb00738.x>
- Kuhlthau, C. C. (1991). Inside the search process: Information seeking from the user's perspective. Journal of the American Society for Information Science, 42(5), 361-371. [https://doi.org/10.1002/\(SICI\)1097-4571\(199106\)42:5<361::AID-ASI6>3.0.CO;2-%23](https://doi.org/10.1002/(SICI)1097-4571(199106)42:5<361::AID-ASI6>3.0.CO;2-%23)
- Lamb, R., & Kling, R. (2003). Reconceptualizing users as social actors in information systems research. MIS Quarterly, 197-236. <https://doi.org/10.2307/30036529>
- Late, E., Ruotsalainen, H., & Kumpulainen, S. (2024). Image searching in an open photograph archive: search tactics and faced barriers in historical research. International Journal on Digital Libraries, 25(4), 715-728. <https://doi.org/10.1007/s00799-023-00390-1>
- Liu, J. (2021). Deconstructing search tasks in interactive information retrieval: A systematic review of task dimensions and predictors. Information Processing & Management, 58(3), 102522. <https://doi.org/10.1016/j.ipm.2021.102522>
- Lunn, D., Harper, S., & Bechhofer, S. (2011). Identifying behavioral strategies of visually impaired users to improve access to web content. ACM Transactions on Accessible Computing (TACCESS), 3(4), 1-35. <https://doi.org/10.1145/1952388.1952390>
- Marzi, G., Balzano, M., & Marchiori, D. (2024). K-Alpha calculator–Krippendorff's alpha calculator: a user-friendly tool for computing Krippendorff's alpha inter-rater reliability coefficient. MethodsX, 12, 102545. <https://doi.org/10.1016/j.mex.2023.102545>
- Moreno, L., Valencia, X., Pérez, J. E., & Arrue, M. (2018). Exploring the web navigation strategies of people with low vision. In Proceedings of the XIX international conference on human computer interaction, 1-8. ACM. <https://doi.org/10.1145/3233824.3233845>

- Mulliken, A. (2017). There is Nothing Inherently Mysterious about Assistive Technology: A Qualitative Study about Blind User Experiences in US Academic Libraries. *Reference and User Services Quarterly*, 57(2), 115-126. <https://www.jstor.org/stable/90017130>
- Power, C., Petrie, H., Swallow, D., Murphy, E., Gallagher, B., & Velasco, C. A. (2013). Navigating, discovering, and exploring the web: strategies used by people with print disabilities on interactive websites. In *IFIP Conference on Human-Computer Interaction*, 667-684. Berlin, Heidelberg: Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-40483-2_47
- Sahib, N. G., Tombros, A., & Stockman, T. (2012). A comparative analysis of the information-seeking behavior of visually impaired and sighted searchers. *Journal of the American Society for Information Science and Technology*, 63(2), 377-391. <https://doi.org/10.1002/asi.21696>
- Sahib, N. G., Tombros, A., & Stockman, T. (2014). Investigating the behavior of visually impaired users for multi-session search tasks. *Journal of the Association for Information Science and Technology*, 65(1), 69-83. <https://doi.org/10.1002/asi.22955>
- Seyama, L., Morris, C. D., & Stilwell, C. (2014). Information seeking behaviour of blind and visually impaired students: A case study of the University of KwaZulu-Natal, Pietermaritzburg Campus. *Mousaion: South African Journal of Information Studies*, 32(1), 1-22. <https://doi.org/10.25159/0027-2639/1697>
- Shah, C., & Bender, E. M. (2022). Situating search. In *Proceedings of the 2022 Conference on Human Information Interaction and Retrieval*, 221-232. <https://doi.org/10.1145/3498366.3505816>
- Solomon, P. (1999). Information mosaics: Patterns of action that structure. *Exploring the contexts of information behaviour*, 150-175.
- Sulong, S., & Yusof, R. J. R. (2024). Developing a blind user mental model (BIUMM) for web browsing. *Universal Access in the Information Society*, 23(3), 1343-1367. <https://doi.org/10.1007/s10209-023-01035-5>
- Talja, S., Keso, H., & Pietiläinen, T. (1999). The production of 'context' in information seeking research: a metatheoretical view. *Information Processing & Management*, 35(6), 751-763. <https://doi.org/10.1016/j.ijhcs.2013.08.002>
- Thatcher, A. (2008). Web search strategies: The influence of Web experience and task type. *Information Processing & Management*, 44(3), 1308-1329. <https://doi.org/10.1016/j.ipm.2007.09.004>
- Vakkari, P. (2003). Task-based information searching. *Annual Review of Information Science and Technology (ARIST)*, 37, 413-464. <https://doi.org/10.1002/aris.1440370110>
- Vigo, M., & Harper, S. (2013). Coping tactics employed by visually disabled users on the web. *International Journal of Human Computer Studies*, 71(11), 1013-1025. <https://doi.org/10.1016/j.ijhcs.2013.08.002>
- Wang, P., Hawk, W. B., & Tenopir, C. (2000). Users' interaction with World Wide Web resources: An exploratory study using a holistic approach. *Information Processing & Management*, 36(2), 229-251. [https://doi.org/10.1016/S0306-4573\(99\)00059-X](https://doi.org/10.1016/S0306-4573(99)00059-X)
- Williamson, K. (1998). Discovered by chance: The role of incidental information acquisition in an ecological model of information use. *Library & Information Science Research*, 20(1), 23-40. [https://doi.org/10.1016/S0740-8188\(98\)90004-4](https://doi.org/10.1016/S0740-8188(98)90004-4)

- Wilson, T. D. (1999). Models in information behaviour research. *Journal of Documentation*, 55(3), 249-270. <https://doi.org/10.1108/EUM000000000007145>
- Xie, H. (2000). Shifts of interactive intentions and information-seeking strategies in interactive information retrieval. *Journal of the American Society for Information Science*, 51(9), 841-857. [https://doi.org/10.1002/\(SICI\)1097-4571\(2000\)51:9<841::AID-ASI70>3.0.CO;2-0](https://doi.org/10.1002/(SICI)1097-4571(2000)51:9<841::AID-ASI70>3.0.CO;2-0)
- Xie, I., Babu, R., Lee, H. S., Wang, S., & Lee, T. H. (2021a). Orientation tactics and associated factors in the digital library environment: Comparison between blind and sighted users. *Journal of the Association for Information Science and Technology*, 72(8), 995-1010. <https://doi.org/10.1002/asi.24469>
- Xie, I., Babu, R., Lee, T. H., Wang, S., & Lee, H. S. (2021b). Coping tactics of blind and visually impaired users: Responding to help-seeking situations in the digital library environment. *Information Processing & Management*, 58(5), 102612. <https://doi.org/10.1016/j.ipm.2021.102612>
- Xie, I., Choi, W., Lee, H. S., Hong, B. H., & Wang, S. (2025). Investigating the interactions between individuals with disabilities and information retrieval systems: A review of help-seeking situations, search tactics, and design recommendations. An Annual Review of Information Science and Technology (ARIST) paper. *Journal of the Association for Information Science and Technology*, 1-30. <https://doi.org/10.1002/asi.24997>
- Zhao, Y., Nacenta, M. A., Sukhai, M. A., & Somanath, S. (2024). TADA: Making Node-link Diagrams Accessible to Blind and Low-Vision People. In *Proceedings of the CHI Conference on Human Factors in Computing Systems*, 1-20. <https://doi.org/10.1145/3613904.3642222>

© [CC-BY-NC 4.0](#) The Author(s). For more information, see our [Open Access Policy](#).