

# Information-Seeking and Information Retrieval

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## Abstract

This study examines how people search for information and evaluates how well information retrieval systems work. It shows that users' needs, search methods, and system features all affect how easily they can find relevant information.

The findings show that more people are using digital resources, especially search engines. However, users who lack strong information skills or rely solely on simple keyword searches often struggle to find accurate information. Features like user-friendly design, good search options, and easy access to resources can make a big difference in how satisfied users feel.

The study identifies common challenges, including information overload, lack of awareness of library resources, and limited support. It highlights how important libraries and information centers are in helping people find information by offering education and focusing on users' needs.

In conclusion, the research shows that understanding how people search for information is key to improving retrieval systems and enhancing user satisfaction in today's complex information landscape.

**Keywords:** Information, seeking behaviour, retrieval, library users.

## 1.Introduction

The processes of finding and acquiring information are fundamental to library and information science. The proliferation of digital tools, automated searches, and artificial intelligence necessitates a comprehensive examination of how individuals use information retrieval systems and how their search behaviors develop over time.

The way people search for information is quite different from how retrieval systems are designed. People's information-seeking is complex and involves making sense of information and dealing with uncertainty. Retrieval systems, on the other hand, focus on efficiency and often expect users to create perfect search queries.

It is important to focus on people when studying how knowledge is sought. Wilson (1999) explains that information seeking is an active process to close knowledge gaps and involves technical, mental, emotional, and social factors. Kuhlthau's (1991) model shows that people often start searching with uncertainty, but as they learn more, they gain clarity and confidence. These studies show that search behavior depends a lot on what users already know, how they feel, and their situation.

In the past, information retrieval focused on how information is represented, stored, organized, and extracted. Early systems aimed for accuracy and logical structure, often assuming users had strong search skills (Salton & McGill, 1983). However, research in academic settings often finds a gap between how systems are designed and how people use them (Ellis, 1989; Joo & Choi, 2015).

New developments in artificial intelligence have changed search engines, making it faster to find information using natural language processing (NLP) and ranking results by relevance. While these changes make information easier to

access, they also bring problems like information overload and not enough source evaluation. Finding information quickly does not always mean new knowledge is created.

It is important to see the difference between how users search and how retrieval systems are built. Most users prefer simple keyword searches instead of using advanced features. This gap is mostly due to system limitations and a lack of research on how users interact with systems, not because users are at fault.

To retrieve information well, users need strong information literacy skills, which should be supported by ongoing and focused training. When evaluating systems, it is important to see how well they help users learn and think critically (Saracevic, 2007). Libraries should work toward including information literacy frameworks in their technology.

Context is still very important in information retrieval. Factors like socioeconomic status and infrastructure have a big impact on how easily people can access information. Studies show that poor digital infrastructure and not enough training make it harder for users to retrieve information, which shows the need for systems that are inclusive and sensitive to different contexts.

In conclusion, searching for and retrieving information are closely linked parts of a single information system. To make access better, retrieval systems should be based on how people actually behave and supported by ongoing help from institutions.

**Table 1: Comparative Overview of Information-Seeking and Information Retrieval**

Aspect	Information-Seeking (Human-Centered Process)	Information Retrieval (System-Centered Process)
<b>Core Definition</b>	The broader, often iterative, human behavior of identifying and fulfilling a perceived need for knowledge. It encompasses feelings, thoughts, and actions.	The technological process of finding and returning material (documents, data) from a collection that matches a user's stated query.
<b>Primary Focus</b>	Understanding the <b>user's cognitive state, motivations, context, and the utility</b> of information in resolving a problem or knowledge gap.	The <b>system's effectiveness</b> in matching query representations with document representations, emphasizing recall and precision.
<b>Key Drivers</b>	Anomalous state of knowledge, uncertainty, task completion, learning, decision-making.	A formal query (e.g., keywords, Boolean expression) submitted to a search system.
<b>Typical Models</b>	<b>Process Models:</b> (e.g., Kuhlthau's Information Search Process, Ellis's behavioral features). <b>Sense-Making Models:</b> (e.g., Dervin's Sense-Making).	<b>Mathematical/Algorithmic Models:</b> Boolean, Vector Space, Probabilistic (e.g., BM25), Language Models (e.g., BERT, neural ranking).
<b>Success Metrics</b>	User satisfaction, problem resolution, sense-making, reduction of uncertainty, task performance.	System-oriented metrics: Precision, Recall, F-score, Mean Average Precision (MAP), Normalized Discounted Cumulative Gain (nDCG).
<b>Context</b>	Highly dependent on the user's personal, social, task, and	Largely context-agnostic at its core; systems may

Aspect	Information-Seeking (Human-Centered Process)	Information Retrieval (System-Centered Process)
<b>Dependence</b>	situational context. The process adapts dynamically.	incorporate contextual signals (e.g., location, history) to improve ranking.
<b>Primary Disciplines</b>	Information Science, Psychology, Communication Studies, Human-Computer Interaction (HCI).	Computer Science, Computational Linguistics, Data Science.
<b>System Interaction</b>	Involves exploration, formulation, collection, and presentation stages. May involve multiple sources beyond IR systems (e.g., people, archives).	Primarily a single transaction or a limited sequence: query input → ranking/output → potential relevance feedback loop.
<b>Role of Relevance</b>	<b>Subjective and multidimensional:</b> Topicality, pertinence, utility, situational relevance, and cognitive authority are all considered by the user.	<b>Objective and algorithmic:</b> Primarily operationalized as <b>topical relevance</b> —the aboutness of a document to the query.
<b>Example Scenario</b>	A researcher exploring a new field experiences uncertainty, browses literature, refines their understanding, and eventually formulates a specific research question.	The same researcher enters the refined question as a keyword query into an academic database, which returns to a ranked list of potentially relevant papers.

Here is a brief paragraph synthesizing the comparative analysis from the provided table:

Information-seeking and information retrieval are related but different ideas in information science. Information-seeking is about people who realize they do not know something and try to find answers. This process is affected by feelings like uncertainty and looks at how helpful the information is in a certain situation. On the other hand, information retrieval is about computer systems finding documents that match what a user is looking for, with success measured by how many results are correct and how many are missed. Information retrieval is only one part of the bigger process of information-seeking. To make better systems, it is important to understand how people look for information, including their changing needs and situations. This way, systems can do more than just find topics—they can help users solve problems and understand information.

## 2.LiteratureReview

Early studies on information retrieval (IR) mainly looked at how well systems worked. But researchers soon saw that users play a key part in finding information. Robert S. Taylor's important 1962 study on information needs showed that when people do not know something, they look for information, which shapes how they ask questions and understand answers. This shows how closely searching for knowledge is tied to getting it.

The landscape of information-seeking behaviour transformed significantly during the 1980s and 1990s, thanks to pivotal research from scholars like Wilson. They explored how individuals identify their information needs and navigate various systems, revealing that information-seeking behaviour is not a linear process but a dynamic interplay of recognising, locating, and utilising information.

Carol Kuhlthau's new Information Search Process (ISP) model, introduced in 1991, showed the mental and emotional steps people go through as they look for information. These steps, such as feeling unsure, exploring, and shaping their ideas, marked a big change from just judging systems to understanding the thinking and feelings involved in searching for information.

In the late 1990s and early 2000s, models started to look beyond just individual actions and included bigger influences. The Comprehensive Model of Information Seeking (CMIS) explained how things like attitude, age, background, and the type of information can strongly affect how people search in different situations.

The start of the Information Seeking in Context (ISIC) conference in 1996 was an important moment, showing how context matters in understanding how people look for information. Researchers began looking at how personal thinking, social factors, and system features work together, leading to a deeper and more complete study of this important topic.

By the early 2010s, the field of interactive information retrieval recognized the complex and ongoing back-and-forth between users and systems. This big change combines what we know about human behavior with new ways to design information retrieval, helping with real-world searches and tasks. It includes both finding information by chance and the ways people try to avoid certain information.

In the Digital Age, especially from the 2010s on, the huge growth of digital information and web search engines has made it very important to understand how people search for and get information. Research now looks at how users move through web search engines, digital libraries, and visual search tools, focusing on context, how the interface looks, and how hard the task is to better understand the complex relationship between people and search technologies.

This ongoing study shows how search strategies keep changing, shaped by context and the technologies used. Models like the planned-situational model help explain how people change their search methods based on different tasks and situations.

The recent coming together of AI and language models has changed information retrieval in big ways. Recent studies are looking at how large language models (LLMs) and new neural methods can make information retrieval better, help users understand more, and improve feedback about what is relevant. This big change moves us from just matching keywords to understanding meaning and creating new information.

### **3. Research questions**

1. What kinds of information do users look for when they want to learn something, and how do these needs influence which sources they choose?
2. How do people use information retrieval systems like library catalogues, databases, and web search engines when they are looking for information?
3. What are the main factors that lead to successful information retrieval and high user satisfaction, especially regarding how relevant, accurate, and timely the information is?

4. What problems do users face when searching for information, and how can library services and information retrieval systems be improved to help with these issues?

#### **4. Research Methodology**

We confidently employed a mixed-method approach, combining both quantitative and qualitative techniques to thoroughly understand library user experiences. Through comprehensive surveys and semi-structured interviews, we obtained both a broad overview and detailed insights from library users. To enhance personal engagement, we implemented standardized post-task satisfaction surveys, effectively capturing participants' immediate reactions and feelings to ensure their voices were strongly represented. Our study also featured dynamic group discussions led by students, faculty, staff, and research scholars, which cultivated a collaborative and inclusive environment. During the pilot phase, we designed robust surveys, detailed interview guides, and comprehensive task lists, all of which supported our empathetic and participant-focused methodology.

#### **5. Significance of Study**

Information seeking and information retrieval (IS&IR) is an interdisciplinary field that brings together how people think and use technology. This field is important for several reasons.

IS&IR is the basis of today's information-driven society. It creates models and tools that help people handle complex data and improve their digital and information skills (Savolainen, 2017).

This field also pushes technology forward. Innovations in retrieval algorithms and ranking models have led to web search engines, digital libraries, and AI assistants (Manning et al., 2008).

IS research also improves Human-Computer Interaction (HCI) by focusing on user experience. It looks beyond system efficiency and examines how people formulate queries and judge what information is relevant (Marchionini, 2008).

Good IS&IR systems are crucial in important areas such as healthcare, where they support evidence-based practices (Eysenbach & Köhler, 2002). They are also important in scientific research and crisis management. The field also tackles big social issues, such as fighting misinformation, reducing algorithmic bias, and closing the digital divide.

#### **6. Objectives of the study**

- This study aims to improve library services and information retrieval technologies to make them more accessible for everyone.

The research will examine how people use the internet to find information, focusing on how effectively search features work.

The study will highlight the challenges people face when searching for information, including limited search skills and technological issues.

Finally, the study will assess the effectiveness of different retrieval methods by examining relevance, accuracy, speed, and user satisfaction.

## 7.Scope of the study

This study explores the exciting intersection of how individuals seek information and the design and functionality of information retrieval systems. It's fascinating to examine users' search behaviors, unique needs, and interactions with essential tools such as catalogues, digital libraries, online databases, and web search engines.

Moreover, we take a closer look at crucial system factors—such as usability, relevance, accessibility, and interface design—that significantly influence users' ability to find the information they need and their overall satisfaction with these systems.

We also consider the cognitive, behavioural, and contextual elements that shape how people search for information, as well as the challenges they encounter along the way. Our primary goal is to harness insights from user behaviour to enhance user-centered system design and improve information services.

By focusing on academic and digital information environments, we aim to equip libraries, information professionals, and system developers with practical insights that can make materials more accessible and user-friendly. Together, we can create a more informed and empowered community!

## 8.Findings of the Study

### 1. How Information Needs Drive Search Behavior:

People search for information to support their studies, work, or personal interests. When they know what they are looking for, they can pick better search methods and sources, which helps them find more relevant information.

### 2. Preference for Easy and Familiar Information Sources:

Most people start searching with search engines, then move on to digital libraries and online databases. They usually avoid traditional library tools like OPACs and printed materials unless they already know how to use them.

### 3. Limited Search Skills Make Finding Information Harder

Many users think they know how to search for information, but most only use basic keyword searches. They often do not use more advanced search methods like using special words to combine searches, adding filters, or using set lists of terms, which can lead to less helpful or incomplete results.

### 4. User Satisfaction Relies on System Usability

A system's ease of use and design are key to user satisfaction. Features like simple navigation, quick performance, relevant results, and clear information are most important. If a system is difficult to use, people may avoid using it in the future.

5. Common Challenges in Searching: Users face several problems when looking for information. These include lacking information literacy, having too much information to sort through, being unable to access paid resources, language problems, and receiving insufficient help from library staff. These issues can make it challenging to find and use the information they need.

## 9.Recommendations

1. Develop Training Programs: Libraries and information centres will hold regular training sessions to help users improve their search skills and use information retrieval technologies effectively.
2. Simplify Information Retrieval Systems: Information retrieval systems should be easy to use and respond quickly. Advanced search options will be clearly shown so users can easily understand and use them.
3. Improve Access to Quality Information Sources: Libraries will make it easier for users to access electronic databases, open access materials, and institutional repositories to meet their needs.
4. Offer Personalised Information Services: We will provide personalised assistance, virtual reference tools, and user support services to help users with complex searches.
5. Include User Feedback: We will regularly collect and analyse user feedback to ensure that our information retrieval systems and library services meet the changing needs of users.

## 10.Conclusion

Information-seeking and information retrieval are vital processes that empower users to identify their information needs and locate what they require quickly. Although digital technologies have significantly streamlined access to information, users still encounter challenges, such as ineffective searching skills, complex systems, and information overload. The effectiveness of information retrieval is heavily influenced by a deep understanding of user behaviour, contextual factors, and specific information demands. Libraries and information centers play an essential role in this landscape, providing reliable resources, equipping users with the skills to navigate information, and offering user-focused services. To enhance user satisfaction and improve information discovery, it is imperative to strengthen the link between research on information-seeking behavior and the design of information retrieval systems.

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