Information Seeking Behaviour Models in the 21st Century: A Critical Review of Theoretical and Empirical Developments

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Abstract

The accelerated development of technology, the emergence of digital environments, and the emergence of information systems spurred by artificial intelligence have all led to a radical change in the information seeking behavior (ISB) of the 21 st century. The current paper critically examines the recent developments of ISB models, which have changed in terms of theory and empirical aspects. It explores how theories published by scholars such as David Ellis, Thomas D. Wilson and Carol C. Kuhlthau have been altered or reconsidered with respect to user-centric, digitized and networked environments. In this study, the author considers notable 21 st century models that consider the technical, social, emotive and cognitions; and it demonstrates how the models can be applied as a professional, academic and everyday information environment. It also encapsulates recent trends in empirical research, and in this regard, the author notes that researchers are becoming more inclined to using mixed-method methods, data analytics, and user-experience research in their work. New concerns which have changed the information seeking behavior, including digital inequality, algorithmic mediation, information overload and disinformation require particular focus. Additional integrative, contextual, and tech-conscious frameworks are required since this review examines the shortcomings and strengths of the current theoretical perspectives. By critically synthesizing theoretically developed and empirically validated models of ISB, the paper illuminates a current transformation of ISB models in response to the complex digital ecosystems and guides the direction of further research in the field of education, library and information science, and other interdisciplinary areas.

Keywords: Information Seeking Behaviour, ISB Models, Digital Information Environment, User Behaviour, Empirical Studies, Artificial Intelligence, Information Overload, Digital Divide

1. Introduction

Information seeking behaviour (ISB) has been a key area of study in the discipline of library and information science (LIS) and related multidisciplinary areas in this century. The search and evaluation of information and the use of that information has changed radically due to the exponential increase in digital data, the widespread use of the internet technology, and the integration of artificial intelligence in the

search engines (Rusli, F. A., 2023). The use of search engines, social media, digital archives, and recommendation systems based on algorithms actively retrieve information in contemporary knowledge societies instead of the usual sources employed in the past (print sources or traditional libraries). A study of user information that aims to find behavior, search motivation, and the impact of contextual factors on decision making is therefore a complex and difficult theoretical task. The structured system of perceiving these processes, their context, user-group-, and technology-specific forms could be discovered in the ISB models literature.

1.1 Evolution of Information Seeking Behaviour Research

The ISB research was theorized in the late 20 th century by the contributions of theorists including Thomas D. Wilson, Carol C. Kuhlthau and David Ellis. The early models concentrated on organized, stage-based, and usually linear methods of information searching with a verbal concentration on the cognitive functions and individual user in an academic or organizational context. The models of Wilson have emphasized the importance of information requirements and contextual aspects, the affective component of the situation presented by Kuhlthau in her Information Search Process (ISP) model, and the behavioral patterns introduced by Ellis, browsing, chaining, and monitoring. These structures contributed greatly to the knowledge since they stopped focusing on the systems and shifted to user-focused viewpoints. Nevertheless, at the beginning of the digital age, the traditional assumptions regarding the accessibility of information started to change. With the emergence of web search engines, digital libraries and networked information systems, there was the introduction of nonlinear, iterative and highly interactive forms of search behaviours (Barber, L. D., 2025). Users stopped going through sequential steps, they moved through hyperlinked worlds, cross platform, and became dependent on algorithmic recommendations. Therefore, ISB research has developed to include social, technological and contextual variables, as information seeking is established as a part of larger socio-technical systems. The development was a shift in rather fixed theoretical models to more dynamic and integrative models that would be appropriate in the modern digital environments.

1.2 Digital Transformation and Changing User Behaviour

The 21 st century has also brought about an unprecedented change in information environments owing to the blistering digitalization. The ubiquity of smartphones, cloud computing, big data analytics, and artificial intelligence has changed the accessibility of information and the strategies that people use to access it. Seeking of information is now usually immediate, mobile, and personal. Predictive algorithms are employed by search engines, recommendation systems filter content and social media platforms sift information streams according to the behaviour of the user. These technological mediations are not only affecting what the users of the same information are exposed to but also in the way they regard credibility, relevance and authority. In the academic world, teachers and scholars are becoming more and more reliant on digital archives, open-access archives, and online academia. In daily life, people resort to the usage of the Internet communities, video portals, and social networks as sources of finding solutions to problems, and making decisions (Samaatan, N., 2025). These environments have broadened the range of ISB research into the field of informal learning, health information seeking, consumer behaviour and social interaction. Meanwhile, the seeking process is complicated by such issues as information overload, misinformation, digital inequality and algorithmic bias. Thus, the modern ISB models should consider mediation with technology, emotional reactions, group searching, and contextual diversity. The digital

transformation, therefore, has brought about the need to refine and reassess the existing theories to indicate the complexity in the real world.

1.3 Rationale and Objectives of the Review

The critical analysis of the ISB models in the 21 st century is yet timely and needed because of the dynamism in the rate of technological change and the diversification of information practices. Though traditional theories still have a significant contribution to make, new empirical studies indicate that information seeking is becoming increasingly hybrid, socially infused, and conditioned by digital infrastructures. It is necessary to critically analyze how classical models have been modified, elaborated or criticized in the recent decades. Furthermore, contributions by psychology, education, communication studies, and human-computer interaction have also been interdisciplinary which has contributed to the scholarship in ISB to provide a wider and more sophisticated view of user behaviour (Huvila, I., 2025). The present review is an attempt to critically examine key theoretical advances and empirical research on the topic of ISB models in modern settings. It attempts to find strengths or weaknesses and gaps existing in the current structures and determines their effectiveness in digital world context and the emergent trends that could define the future research. The study helps to understand information seeking in complex socio-technical ecosystems in a deeper conceptual way by means of synthesizing theoretical views and empirical evidence. Finally, the review offers a basis of coming up with more adaptive, integrative and context-sensitive models that can meet the dynamic nature of information behaviour in the 21 st century.

2. Conceptual Foundations and Evolution of Information Seeking Behaviour Models

The theoretical foundations of Information Seeking Behaviour (ISB) models have their roots in the attempts to comprehend the manner in which people become aware of the need of information, how they seek a source that would provide that information, how they judge the information, and how they can use the information to solve certain tasks or make certain choices. The initial studies carried out within the library and information science domain were more system-based in nature with much attention being paid to how information retrieval systems worked as opposed to how users interacted with them (Priyambodo, A. Z., 2025). With time, this view changed into user-centered systems that considered emotional reactions, cognitive processes, and situation contexts to be the important determinants of information seeking. Theoretical works of researchers like Thomas D. Wilson, Carol C. Kuhlthau, and David Ellis, have created conceptual frameworks of works that are still used in modern studies. The initial models emphasized the fact that the process of information seeking is a complex and reiterative process that is determined by the personal, social, and environmental factors.
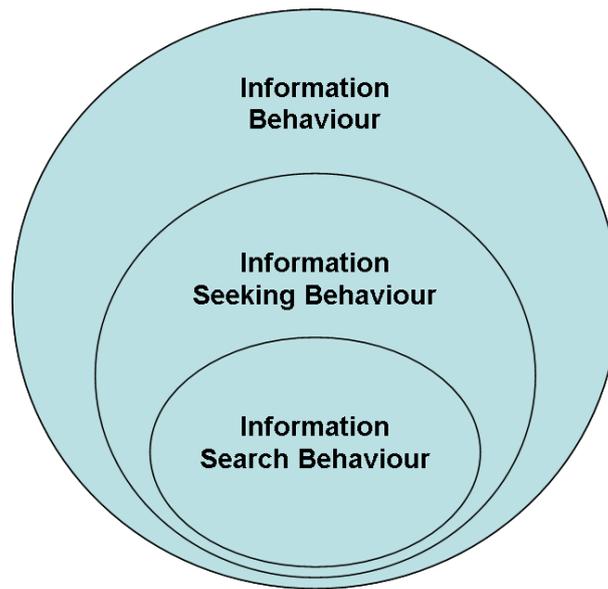
Wilson's Nested Model of Information Behaviour

Theoretically, ISB models came about as a result of interdisciplinary influences such as psychology, communication theory, sociology and human-computer interaction. Cognitive theories focused on the manner in which the user perceives problems, constructs queries and refines searches, whereas affective views attracted the focus on uncertainty, anxiety and confidence at various phases of the search process. An example by Kuhlthau showed that the expression of emotions is part of information seeking and do not conform to exclusively rational explanations of user behaviour (Anwar, R. K., 2025). On the same note, the framework by Wilson brought about the notion that information need occurs on the event of circumstantial stimuli of work, life or problem-solving needs and therefore, information behaviour is placed within the wider social contexts. Ellis made contributions in the form of behavioural patterns that explained the interaction patterns of users in information environments in terms of browsing, chaining, monitoring, and filtering. Collectively, these theoretical underpinnings transformed ISB studies off the mechanistic retrieval frameworks onto whole-person ways of seeing human interaction with information.

The development of ISB models gained speed as the late 20 th and early 21 st centuries saw the introduction of the digital technologies. The conventional models traditionally presupposed structured settings like libraries or organizational databases, where the search patterns used by the users were rather predictable. Nonlinear navigation, hyperlinked information spaces, and interactive search processes, which came with the emergence of the internet, however, undermined previous assumptions. The users started to do the exploratory searches, multitasking on many platforms, and collaborative information searching, which necessitated the theoretical models that could technically support the fluid and dynamic behaviours. This resulted in the development of ISB frameworks with contextual, social, and technological dimensions as they realize that information searching takes place in a complex socio-technical environment, not in the process of solitary cognition.

The other conceptual change was the shift of individual-focused models to socially established points of view. Modern ISB studies recognize that the information seeking is a common act of groups, networks, and co-working settings. Social media, discussion rooms, and business networks have altered the manner in which people explore and confirm information, and the focus lies on the construction and sharing of

knowledge in groups and among peers (Gaikwad, R. R., 2024). This move coincides with the constructivist and socio-cultural theories, which emphasize that meaning is built through the interaction and not through the solitary thinking of an individual. Consequently, the contemporary ISB models consider more and more factors of social influence, trust, evaluation of credibility, and participatory information practices.

The further development of technological progress has transformed the conceptual ideas of ISB based on the incorporation of the elements of artificial intelligence, personalization, and data-driven recommendation systems. The search engines have gone further to predict user requirements, suggest predictions and customize search results according to previous behaviour and this has changed the traditional concept of seeking information actively (Kumar, 2025). The information seeking, information encountering and information consumption have been jumbled up because users are constantly subjected to the curated information content streams. This change has compelled researchers to develop ISB models to encompass passive acquisition of information, serendipitous discovery as well as algorithmic mediation. These developments bring out the necessity of developing conceptual frameworks that take into consideration the human agency and the power of technology.

3. Major Information Seeking Behaviour Models in the 21st Century

The 21 st century has seen the evolution, sophistication, and reformulation of the Information Seeking Behaviour (ISB) models, in keeping with the fast changing digital information spaces. Even though traditional models have still been used to explain the current knowledge, the current models are focusing more on dynamic interaction, sensitivity to the situation and mediation by technology. Scholars have acknowledged that information seeking is no longer a linear process and tied to the structured systems but is a flowing process of digital platforms, algorithmic tools, and collaborative networks (Agarwal, S., 2022). The modern models of ISB thus have taken into account the elements of cognitive, affective, social, and technological to explain more how individuals navigate the complex information ecosystems. These models mirror a change in the rigid theoretical models to a dynamic model that can be used to represent real-time, iterative, and exploratory search patterns across various devices and platforms.

Adaptation of earlier models suggested by scholars like Thomas D. Wilson is one of the most impactful theoretical continuities in the research of 21 st century ISB since his models with revisions and modifications focus on context, barriers and activating mechanisms influencing the information seeking. The work of Wilson is key since it offers a detailed framework between the information requirements and the intervening factors included in the model that include psychological and environmental restrictions as well as demands with roles. In the same manner, the Information Search Process (ISP) created by Carol C. Kuhlthau remains extensively used and expanded in online environments especially when investigating uncertainty, emotional experience, and learning in an online research. Such frameworks have been redefined to deal with digital search contexts, and this points to their flexibility with the new technological realities.

Behavioural pattern approaches as based on the work of David Ellis are another important contribution and explain recurring activities, including browsing, chaining, differentiating, monitoring, and filtering. These trends have acquired a new dimension in the 21 st century as users deal with hyperlinked web space, digital libraries, and recommendation systems. Researchers have extended the model of Ellis to cover

other types of behaviours like multitasking, cross-platform searching, collaborative discovery and iterative query reformulation (Nwachuku, J., 2024). This growth has been observed to be an acknowledgement of the fact that acts of seeking information in modern times can take the form of constant flow between searching, evaluating, and sharing information as opposed to discrete phases.

The more modern ISB models also emphasize exploratory and sense-making strategies which explain complex problem-solving situations. Such models stress that users often start with some unclear information requirements and build up their knowledge by accessing a variety of information sources. Digital environments facilitate this exploratory task through the ability to quickly alternate the sources, visual search interface, and interactive tools that facilitate the construction of knowledge. Consequently, contemporary structures are becoming more nonlinear along with feedback paths and adaptive decision making. This point of view is consistent with the increased attention to user experience (UX) and human-computer interaction, in which the emphasis is made on the role of the interface design, system feedback, and personalization in the search behaviour.

The social and collaborative nature is another characteristic attribute of ISB models in the 21st century. Information seeking is becoming often integrated into the networks where people consult their peers, engage in online community and collaborative filtering. Following the use of social media, academic networking sites and community forums have also made information discovery a collaborative effort and hence scholars have integrated ideas of social search, distributed cognition and joint knowledge generation into ISB models. These developments recognize that credibility evaluation, formation of trust and validation of information do not necessarily take place in a solitary evaluation.

The use of technological mediation has also broadened ISB modelling by the power of artificial intelligence, machine learning, and data analytics. The contemporary search engines are becoming more user-needs predictive, and personalize search results according to behavioural information. It has led to the loss of the distinction between active information seeking and passive information encountering, and researchers have introduced algorithmic impact, serendipitous discovery, and automated filtering to the models of the contemporary world. Information seeking is a co-construction process between the human decision making process and the system guidance process as the users engage with intelligent systems (Alamri, M., 2025). Therefore, the ISB models have also taken the impact of technological infrastructures on attention, relevance judgments and acquisition of knowledge into account.

Regardless of these developments, a critical examination shows that each of these models cannot fully describe the complexity of the modern information behaviour. Each framework has its particular advantages, including conceptual and explanatory eloquence or empirical usability but has limitations in its use in variety of contexts. Other models continue to be overly individual-oriented in their cognition whereas others are more technology or social oriented without taking all the factors into consideration. This division has given rise to the need to have hybrid and integrative models that would combine theoretical knowledge of various traditions. There is growing support by the researcher community to have context-sensitive frameworks which can meet the needs of various groups of users, cultural variations, and dynamic digital landscapes.

4. Empirical Developments and Applications

The empirical studies in Information Seeking Behaviour (ISB) in the 21st century have increased remarkably due to the increase of the complexity of digital information setting and the diversification of user contexts. Although earlier ISB studies were based on conceptual theories and small scale observational research designs, the present knowledge focuses on the analysis of evidence based research based on various methodologies, large datasets and multidisciplinary factors. Empirical studies have come to study the processes of interaction between people and digital systems, the change of contextual variables on search strategies, and the differences in information seeking behaviour of different demographic groups, disciplines, and technological environments. Such studies have further reinforced the theoretical models by offering real-life confirmation, determining the behavioural patterns, and exposing the discrepancies between the theoretical assumption and user behaviours.

One of the key trends in the empirical field is the prevalence of mixed-method research designs which merge quantitative analytics and qualitative understanding. They often combine surveys, experiments, log analysis, eye-tracking research, and interviews in order to record the measurable behaviour and the subjective experiences of the users (Alamri, M., 2025). In a case of example, the search logs of digital libraries and other academic databases are analyzed by the researchers to determine how queries are formed, what paths are taken in the search, and how much time is spent on them, and qualitative interviews are conducted to reveal how employees feel, whether they are becoming confused, frustrated, or confident during the search process. This methodological heterogeneity has given a more nuanced view of information seeking through an association between behavioural data to cognitive and affective aspects that were initially emphasised within theoretical frameworks by scholars like Thomas D. Wilson and Carol C. Kuhlthau. It is usually proven through empirically determined findings that the information seeking process is usually iterative, contingent and depends on the personal and technological factors.
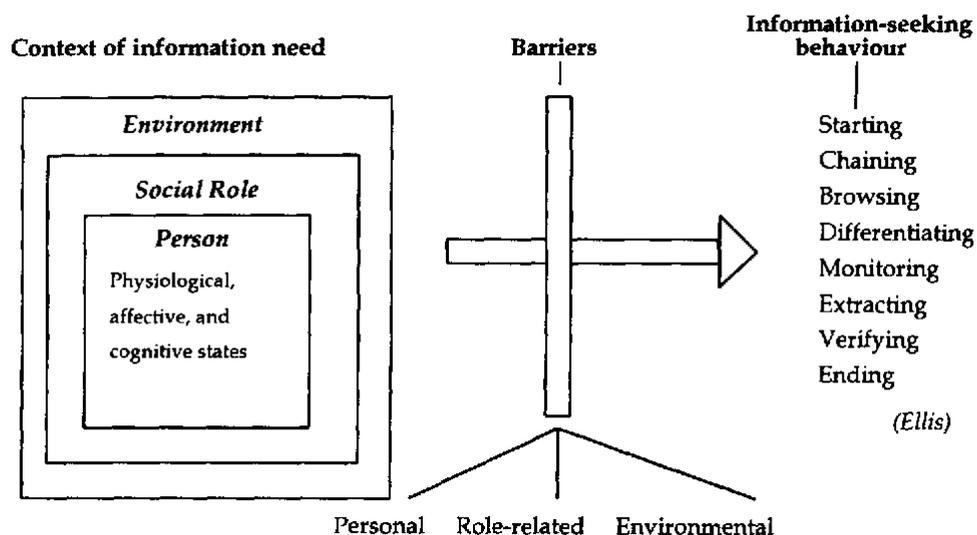
Contextual / Interdisciplinary Information Behaviour Framework

Empirical research on the information literacy, digital search aspects, and research practices of higher education students has been a wide area of research. The results show that search engines are often used by students as portals and they tend to give more important to convenience and less to source evaluation.

It is also found that depending on academic level and disciplinary background and exposure to digital tools behaviour varies (Kundu, D. K., 2020). To illustrate, more advanced users are likely to use more complex tools like database filtering, citation tracking and systematic review, but beginners users are more likely to use simple tools like the use of keywords and the superficial assessment. This understanding has guided instructional design, library services as well as design of information literacy programs that seek to empower effective and critical use of information.

In addition to the academic setting, ISB has also been studied empirically in the context of professional, health, consumer and daily life settings. Research in healthcare has been conducted to assess the behavior of patients with regard to seeking medical information online, determining credibility, and using digital health technologies. Research studies, in workplaces, examine collaborative information seeking, sharing in knowledge and decision making within a workplace with the support of organization information systems (Wani, I. H., 2025). The information seeking in everyday life (ELIS) has come into the limelight particularly with the stress it has on how people engage through social media, video platforms, and online communities to resolve problems, acquire new skills, and make personal decisions. This has been proven through these applications, information seeking is highly incorporated into everyday life and is affected by social interaction, accessibility and affordances in technological uses.

Empirical ISB research has also been revolutionized through technological innovation, which can be used to conduct big data analytics and real-time behavioural tracking. The broad information about user interaction on digital platforms enables researchers to track the trend in large scale, such as click behaviour, scrolling activity, recommendation engagement, and cross-platform navigation. This kind of data has shown how algorithmic mediation has become increasingly important in information exposure and decision making. Evidence indicates that personalization can make things more efficient yet also restrict the range of information which raises some issues of filter bubbles and selective exposure. These results have led to critical debates on transparency and ethical design as well as the position of the user agency in informational ecosystems through algorithmic means.

The other important empirical move is the use of cross-cultural and comparative research that points out the difference in information seeking behaviour in different geographical areas, educational systems, and technological systems. Research has found that access and digital capabilities, language advantages, and information source trust differ, and contextual sensitivity is a crucial component in the context of ISB models. This literature has helped in the perception of digital inequality and how socio-economic attributes affect information practices. Consequently, there is growing empirical evidence that there is a need to have inclusive models that can consider different user experiences and technological differences.

Although there has been notable improvement, empirical studies provide a revelation to the constraints in the current ISB models. Numerous literature indicates that there exist gap between theoretical phases and real user behaviour, especially in environment with digital speed where search and evaluation and sharing of information takes place simultaneously (Sun, S., 2025). Besides, the pace of technological change may tend to exceed the model maturation process, and the demand to continuously validate and refine the model empirically emerges. The researchers consequently advocate longitudinal studies, real-world experimentation and interdisciplinary collaboration as the key solution to developing ISB scholarship.

5. Emerging Trends, Challenges, and Future Directions

The 21st century has presented some paradigm trends that still transform the Information Seeking Behaviour (ISB), posing some opportunities and challenges to the researchers and practitioners. The growing incorporation of the artificial intelligence (AI), machine learning, and predictive analytics into the information retrieval systems is one of the most prominent emerging trends. Intelligent algorithms have now been used by search engines, digital libraries, and social media platforms to tailor search, suggest content and predict user requirements using previous behaviour (Ji, K., 2024). This information technology mediation has fundamentally changed the information seeking behavior whereby a portion of the control power lies in the hands of the automated systems. Although personalization has increased efficiency and relevance, it has led to transparency, bias in algorithms, and exposure to different points of view. In turn, the dynamics of the interaction between the human and the algorithmic in complicated digital ecosystems will have to be approached critically by the future ISB models.

The other key trend is the development of cross-platform and multimodal information environments. Users are using more and more text, audio, video, infographics, and interactive media on more and more devices, such as smartphones, tablets, and wearable technologies (RajeshKumar, D., 2017). Information searching is no longer a one-session search but a process that happens on related platforms like academic databases, social networking sites, forums, and streaming platforms. This flow movement disputes the traditional models of stage-based theories and demands integrative models that explain continuity, multitasking and context-switch behaviours. Though there has been an improvement in technology, there is still a lot of hurdle in the form of information overload and misinformation (SCIENTISTS, I. H., 2025). The number of online digital resources is incredible, and sometimes, users cannot find a credible and relevant source to rely on. The speed with which false or misleading information is spread makes the process of making decisions even more difficult, especially within such a sensitive area as health, politics, and government. These issues help to emphasize the increased significance of critical information literacy and evaluative skills in the context of ISB. Scholars stress that the models of the future should incorporate the cognitive, emotional, and ethical aspects of information evaluation since it has been noted that it is the social trust, digital culture, and personal belief systems that determine credibility assessment.

Another burning issue informing the future of the ISB research is the issue of digital inequality. As the global landscape on technological accessibility has improved, the gaps in the digital infrastructure, skills, and education still affect the way people seek and use information. The literature on cross-cultural studies indicates that socio-economic factors, language barriers, and different degrees of digital literacy have a substantial impact on the search behaviour and information outcomes (Panduranga Swamy, M., 2021). To deal with such inequalities, we need context-sensitive models which take into consideration both structural constraints as well as individual cognitive processes. Subsequent studies should therefore be more inclusive and make sure that the theories of ISB represent the heterogeneous populations and not technologically privileged populations.

Interdisciplinary cooperation is becoming a widely accepted way of promoting the ISB scholarship. The efforts of psychology, education, communication studies, sociology, and human–computer interaction have augmented theoretical approaches and methodology. To give an example, user experience research and affective computing can give knowledge about emotional reactions when seeking information, and data science methods can be used to conduct a large-scale analysis of behaviour. The overlap of fields of

study encourages the creation of hybrid models that combine the cognitive, social, technological, and cultural layers. Ethics are also another key trend towards the future research in ISB. User data collection and analysis to personalize the processes jeopardize privacy, consent, and surveillance (Wardle, C., 2025). As the use of digital platforms to track user activities grows, researchers have to weigh between empirical research and data responsibility. Ethical ISB models ought to symbolize the concepts of transparency, user autonomy, and fair access of information. Also, the psychological consequences of constant connectivity, such as the problems of digital fatigue, attention fragmentation, and dependence on algorithmic systems, need to be studied more extensively.

6. Conclusion

The 21 st -century models of Information Seeking Behaviour (ISB) represent a dynamic and changing area of research due to the rapid technological innovation, growing digital ecosystems as well as more complex contexts of user. Based on theoretical foundations, which put a stronger emphasis on cognitive stages, affective experiences and contextual triggers, the field has advanced towards integrative models that consider social interaction, mediation by technology, as well as algorithmic influence. Modern empirical studies have strengthened the perception that information seeking is not linear, repeatable, and entrenched in the socio-technical setting where personalization, artificial intelligence, and cross-platform interaction play a major role in the user experiences. Simultaneously, such new challenges as the information overload, misinformation, digital inequality, and ethical issues related to the data privacy require critical thinking and theoretical clarity. It has been demonstrated that contemporary information behaviour is multifaceted and requires adaptive, inter-disciplinary and context-sensitive methods. Current studies should thus endeavor to pursue the continuity between theory and innovation in the future so that the classical knowledge can be applied and yet it can adapt to the changing digital realities. Yet, by combining the development of the theoretical progress and the empirical observations, this review highlights the role of establishing the complete model of ISB balancing human agency and technological impact, fostering the development of critical information literacy, and serving the needs of various users in the global context. Still, as it comes up to the 21st century, the study of information seeking remains critical to the development of the Library and Information Science scholarship and the design of inclusive, ethical and useful information systems to facilitate informed decision-making in an ever-connected world.

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