Introduction to information seeking behavior—A review of literature and field practice directions

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Abstract

The article tries to discover the major authors in the field of information seeking behavior via social network analysis. It is to be accomplished through a literature review and also by focusing on a graphic map showing the seven most productive coauthors in this field. Based on these seven authors' work, five probable research directions about information seeking behavior are discerned and presented.

Full Text

Preamble

Introduction to Information Seeking Behavior: A Review of Literature and Field Practice Directions

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Abstract
This article identifies major authors in the field of information seeking behavior through social network analysis. By examining a graphic map of the seven most productive co-authors in this domain, the study discerns five probable research directions for information seeking behavior based on these scholars' contributions.

Keywords
Social network analysis, Library and Information Science database, Information seeking behavior, User behavior

1. Introduction

As critical reference resources for library services, library information systems, workflows, websites, and the study of information seeking behavior represent

principal research areas in library science. In physical library settings, when patrons use library facilities or interact with staff, a series of encounter phenomena occur: media→technology and computers→access→contact with information→borrowing→returning→independent learning→fine payment, suggestion systems, library layout→librarian expertise→cataloging, indexing, classification, rules and regulations[1-3].

However, the Internet has become increasingly important for both educators and students to obtain useful information. Contemporary models of information seeking behavior must therefore consider not only patron activities within library buildings but also the broader information environment of their daily lives and workplaces. This perspective acknowledges the rapid development of information environments where learners inhabit interactive communication villages centered on shared knowledge creation. These unprecedented challenges necessitate new models to understand information seeking behavior and drive structural changes in library workflows, website design, and entire library automation systems.

Consequently, discussing information seeking behavior in the information age requires synthesizing elements from established models. The primary objective of this project is to identify and explore new research directions in information seeking behavior through social network analysis of co-author relationships and examination of key authors' work on online information seeking behavior. This paper presents one component of that project, utilizing Ucinet (free social network analysis software) to analyze journal articles from LISA (Library and Information Science database).

2. Research Design, Assumptions, and Major Issues

The research design employs social network analysis to map co-author relationships. Since key authors occupy central positions in this network, their work suggests probable directions for information seeking behavior research in the information age. This project operates under several assumptions: (1) Journal articles in LISA represent the most relevant works in information seeking behavior; (2) The co-author relationship map reflects the scholarly community and its mutual relationships; (3) Key positions within the social network are held by the most prominent authors; and (4) The works of these key authors represent the most important knowledge about online information seeking behavior.

To project future research directions, the first step identifies key authors through analysis of researchers' social network relationships. The second step examines their published works to determine their contributions. In accordance with these goals and design, this study addresses three core questions: What do the social network relationships among authors look like? Who are the major players within this network? What are the research directions for information seeking behavior? The first two questions are addressed in the "Results" section, while the third is explored in the "Discussion." The conclusion summarizes practical

directions, limitations, and future research.

3. Research Method and Process

The research method is social network analysis, a data mining approach comprising four steps: data collection, data cleaning, data analysis, and graphic interpretation. First, data collection involved retrieving articles from LISA using "information seeking"as the search keyword, yielding 1,889 items downloaded on September 1, 2008. Second, data cleaning required developing a computer program (using JAVA) to transform the LISA database' s .txt format into one processable by Ucinet. Third, data analysis used Ucinet to calculate each author' s number of publications, collaborative relationships, and co-author networks. Fourth, graphic interpretation produced network maps displaying nodes (authors) and lines (collaborative relationships). By simplifying these social network maps, the final graphs more directly and clearly reveal key authors' positions and relationship strengths.

Through this four-step process, the research yielded two graphs: one showing the complete co-author relationship map, and another simplified map displaying key authors' strength (publication count) and influence (social network relationships).

4. Results

Based on the above process, two social network relationship maps for the information seeking behavior research field are presented below. Figure 1 [Figure 1: see original paper] answers the first research question about the nature of authors' social network relationships, showing three main groups (center of graph) and many occasional authors (left side). To better understand key authors, their teams, and networks, Figure 2 [Figure 2: see original paper] provides a simplified version based on Figure 1.

Figure 2 [Figure 2: see original paper] addresses the second research question about major players in the network, illustrating their power and influence.

5. Discussion

Analysis of Figures 1 and 2 identified seven key authors representing the current mainstream in online information seeking behavior research: (1) Amanda Spink, studying information systems and log analysis; (2) Reijo Savolainen, using everyday life sociology theory; (3) David Nicolas, focusing on log analysis and E-Scholarship; (4) T. D. Wilson, renowned for information behavior models; (5) David Ellis, analyzing other authors' models; (6) Carol C. Kuhlthau, famous for the Information Search Process Model; and (7) Gary Marchionini, researching information seeking in electronic environments.

Amanda Spink leads the foremost research team in online information seeking behavior. As a prolific scholar, her work encompasses human information be-

havior[4], information needs and retrieval systems[5], medical information system evaluation[6-7], theoretical frameworks for information science[8], cognitive styles[9], sexual information seeking[10], multimedia collections[11], multitasking Web search[12-14], user behavior measurement[15-17], Web search trends[18-20], Web log analysis[21-22], mobile data access[23], and user selection behaviors[24-27]. Spink collaborates widely, working with experts on search engines, user behavior, medical information, and cognitive psychology. Following her 1991 collaboration with Kuhlthau[28], Spink adapted her research to evolving information environments, focusing on emerging issues.

Reijo Savolainen and his team represent the second most prominent group, using everyday life sociology as their research foundation[29-33]. Savolainen developed models including Web user-generated content[34], social cognitive frameworks[35], spatial factors[36], academic capital[37], and time as a context for information seeking[38]. His latest Schematic Model positions time as a fundamental variable for information seeking scenes, a necessary condition for access, and a measurement standard for the process.

David Nicolas leads the third group. From 1987 (when information seeking articles increased) to 2005, his work examined educational applications[39] and systematic user behavior observation[40], with recent focus on log analysis[41-43] and virtual environment scholars[44-45]. Nicolas collaborated extensively with P. Williams and P. Huntington on E-Scholarship.

T. D. Wilson heads the fourth group. After cognitive-oriented information behavior work, Wilson continued studying information seeking for decades[46]. Unlike Peter Ingwersen' s cognitive research[47], Wilson focused on diverse information seeking behaviors[47-48], often compared with Kuhlthau' s model[49-50]. The fundamental difference: Wilson approaches from user needs, retrieval, and usage perspectives, while Kuhlthau emphasizes user behavior-mentality relationships during the search process. Kuhlthau focuses on user feelings; Wilson prioritizes efficiency. Wilson integrated West German and British research[51], while Kuhlthau developed her model from five university investigations[52]. Wilson corresponded with Savolainen about information use in 1997 and collaborated with David Ellis in 2000-2002[54]. His research includes user learning[55], user studies[56], and uncertainty[57] to solve practical problems[58-59].

David Ellis leads the fifth group, modeling information seeking across diverse subjects—physical vs. social sciences[60], medical practice[61], industrial environments[62], and academic researchers[63]. While others create models, Ellis focuses on model application. His collaborations increased after 2000, working with prolific scholars like Wilson, Ford, Foster, and Spink rather than building a small team.

Carol C. Kuhlthau leads the sixth group, proposing the famous six-stage information search process: task initiation, topic selection, refocus exploration, focus formulation, information gathering, and search closure. Her work emphasizes uncertainty and intervention. Her clear, flexible model has generated numerous

theories and studies. Burdick[67] found gender differences in focus formulation using her model. Vam Kampen[68] identified graduate student anxiety in stages one and three. Jones[54] applied the model to study nurses' medical information seeking. Esmaeel[69] found 41% of respondents remained in the "information gathering" stage. Kim[70] incorporated Kuhlthau' s model into her own framework, while Susan[71], Naseer[72], and Abdulmohsin[73] all cited her work.

Gary Marchionini leads the seventh group. His Process Model of Information Seeking[74] describes eight steps from problem recognition to solution: (1) recognize problem; (2) define problem; (3) choose search system; (4) formulate query; (5) execute search; (6) examine results; (7) extract information; (8) reflect, iterate, stop. His systematic process model remains influential, though his team has shifted toward search engine intelligence.

Table 1 compares these seven authors' directions and contributions.

Synthesizing these contributions reveals five probable research directions:

First, virtual communities are transforming information seeking behavior daily. Unlike traditional library research, defining user groups has become difficult. Research must shift from identifying individual users and purposes to analyzing collective characteristics and behaviors of many users.

Second, in Web-based environments, execution and evaluation actions are closely approximated, as Norman described in 1986 HCI research[75]. Since information resources are no longer single sources, users can choose among alternatives more than ever, creating interactions between execution and evaluation. Information retrieval may comprise numerous short processes.

Third, although not a sophisticated system formula, information retrieval involves repetitive simple steps. Dynamic communication between users and computers is multi-directional, involving many users and many computers. Information seeking behavior encompasses not only psychological and social factors but also personal learning processes, cultural and linguistic influences, technological changes, organizational culture, access skills, critical thinking, imagination, ambition, and creativity. Traditional library services must address these new challenges.

Fourth, while task-oriented information seeking persists, non-commissioned activities and informal retrieval functions have increased. These include not only information needs, retrieval skills, and usage purposes but also personal approaches like surfing, browsing, searching, and bookmarking. Information retrieval has evolved from one-way, closed systems to two-way, open-ended processes. Discussion of individual needs may extend to group needs, as retrieval approaches simultaneously influence needs and usage.

Fifth, future research cannot ignore non-linear, dynamic models where endpoints may occur at any step. As information technology adoption expands, social and organizational factors become increasingly important. In Web-based environ-

ments, the minute may become the most important measurement unit, and any retrieval model must incorporate time variables.

6. Conclusion

In the information age, researchers studying information seeking must consider more elements than ever. Interactive communication opportunities for educators and students have expanded dramatically, making social software' s role in information seeking a high-profile topic in library and information science.

Summarizing these seven key authors' contributions provides a practical method for identifying valuable elements in current information seeking models. This work aims to stimulate further research possibilities and understanding of future evolution in information seeking behavior. Information technology's impact does not render previous models obsolete but rather encourages optimization based on established foundations, which is why this paper has detailed five general research directions.

However, this study has limitations. The data came exclusively from LISA, only a few key authors were selected using one data mining technique, and searching only for "information seeking" may have missed important relevant articles. These limitations necessitate deeper future investigation.

Despite these constraints, we believe new research designs in this area can be reasonably formulated by considering these five general directions and distinctive elements from carefully selected works.

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Note: Figure translations are in progress. See original paper for figures.