Association Mechanism Between User Search Intent and Search Strategy Selection: Postprint

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Abstract

[Purpose/Significance] Search intent constitutes the starting point of the information search process, while search strategy represents the planning of search behavior. The association mechanism between these two elements serves as a concentrated manifestation of the dynamic development patterns of search behavior. Investigating this association mechanism between search intent and search strategy selection facilitates a deeper understanding of the causes and processes underlying the emergence and evolution of search behavior. [Method/Process] Data on search intent and search strategies were collected through questionnaires. UCINET was utilized to examine strategy selection preferences under different intents, SPSS Modeler was employed to explore strategy combinations for various intents, and ROST CM was adopted to investigate information encountering phenomena based on different intents. [Results/Conclusion] Searching and browsing are the most frequently employed search strategies during user information seeking. Preferences for search strategy selection corresponding to different search intents exhibit significant differences and demonstrate distinct search strategy combination patterns. Information encountering occurs with relatively high probability in contexts such as information lookup, resource download, and advice consultation.

Full Text

Preamble

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Abstract

[**Purpose/Significance**] Search intention represents the starting point of the information seeking process, while search strategy constitutes the planning of

search behavior. The correlation mechanism between these two elements reflects the dynamic development patterns of search behavior. Investigating this correlation mechanism facilitates deeper understanding of the causes and processes underlying the generation and evolution of search behavior. [**Method/Process**] This study collected data on search intentions and strategies through questionnaires, employed UCINET to examine strategy selection preferences under different intentions, utilized SPSS Modeler to explore strategy combinations for various intentions, and applied ROSTCM to investigate information encountering phenomena based on different intentions. [**Results/Conclusions**] Searching and browsing are the most frequently used strategies during information seeking. Different search intentions correspond to distinct user preferences in strategy selection and exhibit different strategy combination patterns. Information encountering is most likely to occur during information searching, resource downloading, and advice consultation scenarios.

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User-oriented information seeking behavior research aims to understand how people discover and access different information resources and attempts to explore the complex mechanisms underlying behavioral patterns. Information seeking behavior begins with search intention, which encompasses information needs, search goals, and search motivations. Search strategy represents users' planning of their search behavior and occupies a central position among behavioral elements. Both constitute important components of information seeking behavior research.

The correlation mechanism between search intention and strategy selection represents the interaction between users and resources—it is the external manifestation of search intention, the internal driving force behind search strategy, and the dynamic development and implementation process of search behavior. For a long time, relevant research has tended to fragment the information search process itself, focusing on satisfying an independent, specific information need. This study takes the connection between users' search intentions and strategy selection as its entry point, examines behavioral changes during the search process, and reveals the characteristics and patterns of information needs and search behavior in the network environment, which holds significant theoretical importance.

From the perspective of user information seeking practice, with the widespread application of search engines and social media, coupled with smartphones and tablets gradually replacing desktop computers, and wearable devices acquiring information exchange capabilities, the proliferation of information access channels has elevated information availability to unprecedented levels. However, users still face severe challenges of information overload and irrelevant information. Deep research into users' search behavior habits and intentions is key to improving search efficiency and experience, and can provide support for estab-

lishing and improving knowledge service systems and search systems, holding important practical value.

2 Related Research

2.1 User Search Intent Research

Academic research on search intention is burgeoning, with major international conferences such as SIGIR and WWW increasingly emphasizing search intent classification and recognition in recent years. Classification research on search intention initially focused on search goals. A. Broder [1] categorized search intentions into informational, transactional, and navigational based on user needs —a classification that enjoys wide acceptance and good applicability. Meanwhile, some scholars have attempted to refine search intentions from dimensions beyond goal orientation for fine-grained research needs. V. B. Nguyen et al. [2] defined search intention across four dimensions: ambiguity, authority sensitivity, time sensitivity, and space sensitivity. However, starting from specific research problems, constructing a scientifically complete classification system for search intentions based on fundamental categories remains a persistent hotspot. Current search intent recognition research primarily utilizes search queries, search results, and search behavior data to extract and analyze search behavior characteristics. N. J. Belkin et al. [3] analyzed query terms and query length; D. Vallet et al. [4] ranked entity categories in search results; Zhang Xiaojuan [5] used logs to analyze user query reformulation behavior. However, insufficient attention has been paid to how recognized intentions can be applied to search engine optimization.

2.2 Information Search Strategy Research

Information search strategy research has undergone a three-stage evolution: Moves → Tactics → ISSs (Information Seeking Strategies). Moves focus on relatively fragmented information seeking actions; Tactics provide systematic classification of search methods, also known as the information seeking behavior hierarchy; ISSs construct search strategies multi-dimensionally. Moves represent low-level individual actions involving too many search actions, making research difficult. ISSs establish a three-dimensional structure composed of users, resources, and methods, but the components of this integrated framework remain to be further discovered, making research at the ISSs level highly uncertain. Therefore, current research primarily focuses on specific Tactics, examining both the composition of tactics-level search strategies and specific search strategies. M. J. Bates [6] first summarized four common search methods: searching, document structure, asking, and monitoring. H. Xie [7] comprehensively identified six methods: browsing, searching, tracking, selecting, consulting, and trial-and-error. Yuan Hong [8] compared information browsing efficiency between traditional network environments and social media environments. Tian Mei and Zhu Xuefang [9] used critical incident technique and grounded theory to explore

encountering strategies and proposed a model for cultivating college students' information encountering ability.

Search strategy selection and its formation mechanisms have also attracted attention. Z. Yue et al. [10] used "behavior pairs" and hidden Markov models to model search strategies, finding that collaborative and individual searches employ different strategies. S. Joo et al. [11] used association analysis and multiple regression to study search strategy selection in digital library exploratory search. Existing research has also preliminarily explored the formation mechanisms of search strategy selection preferences. A. W. Lazonder et al. [12] found that search strategies are influenced by information organization methods—users employ more searching than browsing when looking for websites, but more browsing when searching for information within websites. Wang Zhijin et al. [13] noted that consumer types, product types, and platform information environments determine specific retrieval strategy selection. Wang Guangxin et al. [14] analyzed differences in students' selection of web information search strategies, concluding that individual factors, search tools and techniques, and task contexts and types influence search strategy selection.

2.3 Research on the Relationship Between Search Intent and Strategy Selection

Research revealing the patterns between user search intent and strategy selection is just beginning both domestically and internationally, with limited research findings. H. Xie [7] abstracted the relationships among intentions, entities, methods, and resources through text analysis of 40 librarians' descriptions of search processes, establishing an association model between interactive user information intentions and information search strategies. Yuan Hong et al. [15] used the berry-picking model and diary study methods based on observation experiments, revealing patterns between query changes (intentions) and thinking (strategies) in casual leisure search behavior through text analysis and data modeling. However, sample selection and typical case studies have certain limitations, making the scientific validity of these findings subject to further verification.

In summary, although research in the fields of information search intention and search strategy is relatively mature, several shortcomings remain: (1) Numerous classification systems exist for search intentions and strategies, but when combined with specific research problems, the completeness of multi-dimensional classification systems and the independence among categories remain uncertain; (2) Existing research has confirmed the existence of search strategy selection preferences and preliminarily analyzed their causes, but the correlation mechanism between user cognition and specific implementation planning has not been thoroughly revealed, and there is a lack of truly user-centered research examining strategy application from different search intention perspectives. It can be argued that research findings on search intention and strategy classification systems will continue to be inherited and developed in emerging research questions, while the correlation mechanism between search intention and strategy

selection represents a field urgently needing exploration. The above research findings provide important theoretical and methodological support for refining research questions and conducting studies in this domain.

3 Basic Theoretical Framework Definition

3.1 Information Search Intent Classification

Based on A. Broder' s theory [1] and following D. E. Rose' s [16] approach to refining search intent classification systems, this study subdivides informational search intent into information searching intent, knowledge acquisition intent, and advice consultation intent. Information searching intent primarily manifests as searching actions, including querying, finding, searching, and listing. Knowledge acquisition intent represents the desire to understand knowledge in specific domains. Advice consultation intent represents the desire to obtain certain opinions. This study also specifically describes transactional search intent as resource downloading intent and navigational search intent as navigation/URL intent (see Table 1).

3.2 Information Search Strategy Classification

M. J. Bates [6] proposed that information search strategies mainly include searching, browsing, monitoring, and encountering. With the rapid development of social search, seeking help from others on Q&A communities and various interactive platforms has gradually become a new information acquisition approach—this is the asking strategy. Based on this, this study divides information search strategies into five categories: (1) **Searching**: Users distill their information needs into keywords, and search engines present results to users in a certain ranking order. (2) **Browsing**: When users are in a certain information environment, they examine information one by one according to their needs and identify useful information. (3) **Tracking**: Regularly following and accurately capturing information of interest to obtain information related to existing needs, such as subscriptions in WeChat. (4) **Encountering**: Unplanned or unexpected information acquisition. J. Krikelas [19] proposed "casual information gathering," considered the origin of the encountering concept. (5) **Asking**: Using social channels to consult others' opinions and advice, seeking help from experts or those with similar experiences.

4 Research Design and Implementation

4.1 Research Method

This study primarily employs the questionnaire survey method. Information behavior research has always emphasized using scientific procedures to solve problems, addressing the subjectivity, complexity, uncertainty, and even untruthfulness that behavioral subjects may introduce to research itself. Among numerous social science research methods, questionnaires have always been fa-

vored and represent one of the most widely used methods in current information behavior research [20]. Of course, search log analysis and behavioral experiments are increasingly applied in information behavior research. Search log analysis can systematically analyze naturally formed behavioral trace data, while behavioral experiments can effectively create simulated situations and control research variables. However, they also have inherent limitations: search logs are difficult to obtain and technically challenging to analyze, while the complexity of behavioral experiments limits sample size. Questionnaire surveys offer good operability and facilitate large-sample research.

4.2 Questionnaire Design

4.2.1 Design of Items on Search Intent and Strategy Selection Since searching, browsing, asking, and tracking generally involve clear information needs, this study sets different search intentions through question formats. Options A through D correspond to the above four search strategies under specific search intentions, thereby obtaining search strategy selection preferences for the four search intentions excluding encountering.

(1) Question Design. Question design followed these principles: Avoid using professional terminology to describe search intentions. Since respondents may not be familiar with professional theories and concepts of information seeking, it is necessary to create different information demand situations in questions to illustrate corresponding search intentions. For example, when describing information searching intent, the situation "If you want to learn about Spring Festival customs" was created. Reflect different search situations for the same intention as comprehensively as possible. Two situations were designed for each intention: work/study situations and life situations. For example, the work/study situation for advice consultation intent was "If you are interested in majors at the Art College and want to know whether you can transfer and the transfer process," while the life situation was "If you need to attend an important banquet for work and want to know what style of shirt and tie to pair with a black suit." Design single-choice and multiple-choice questions for each situation under different intentions. Single-choice questions investigate the selection frequency of individual search strategies, while multiple-choice questions explore search strategy combinations. The single-choice phrasing was "If you conduct one search, which method do you think will ultimately solve this problem?" The multiple-choice phrasing was "To obtain satisfactory results, which of the following methods are you inclined to try?"

(2) Option Design. Option design followed these principles: When describing search strategies, keywords come in two types: one directly extracted from the description of search intentions, and the other being literal association words, to accommodate respondents' different information needs and expression abilities. For example, in the question about Spring Festival customs, search keywords include directly extracted "Spring Festival customs" and related terms like "red envelope" and "New Year greetings." Avoid respondents misunder-

standing browsing strategy as "reading." Example browsing strategy description: "Find relevant events on websites like Xinhua News and Tencent News according to classification directories by region and event type." Asking is an information transmission behavior through channels, so option descriptions include as many platforms as possible, such as domestic and foreign Q&A communities like Baidu Zhidao, Zhihu, Quora, Tipask & Question, relevant forums, and post bars. Additionally, for search tasks with strong professionalism, the option "directly consult professionals" was included. When describing asking options, the diversity of information push platforms was highlighted, including subscription accounts, interest tribes, community push information, and email push information.

4.2.2 Question Design for Information Encountering Under Different Intentions Encountering refers to users accidentally discovering needed or interesting information. Its uncertainty determines that relevant research data can only be obtained through subjective questions. First, the phenomenon of information encountering was briefly introduced to give respondents an intuitive understanding of the concept. Then, appropriate examples of information encountering were provided to help respondents judge which of their past information acquisition experiences belonged to information encountering. Finally, respondents described the process of information encountering in text, mainly including what information problem they wanted to solve at the time (i.e., the user's search motivation, used to study which types of search intentions are prone to encountering phenomena) and what information they encountered (used to judge whether the user' s information seeking experience was information encountering).

4.3 Survey Implementation

After conducting a pilot survey of 36 questionnaires to timely correct layout, content design, and language expression issues, the formal survey began. The formal survey was conducted on Wenjuanxing.com over a period of 20 days, collecting 245 questionnaires, with 204 valid questionnaires, yielding an effective rate of 81.9%. The research subjects were internet users from different regions, age groups, and educational backgrounds. Questionnaire reliability and validity test results showed a Cronbach' s alpha coefficient of 0.735, indicating good consistency of questionnaire data; the KMO sample measure was 0.777, and Bartlett' s sphericity test chi-square statistic was 319.345 ($df = 45$, $p < 0.001$), indicating that the scale was suitable for factor analysis. These results demonstrate that the questionnaire design in this study is reasonable and reflects the accuracy and reliability of behavioral data obtained through questionnaires.

4.4 Data Analysis Tools

To visually present users' search strategy selection under different intentions, the visualization analysis tool UCINET was used to draw relationship diagrams

to determine users' strategy selection preferences. Since traditional statistical analysis cannot discover hidden patterns behind surface data, the data mining software SPSS Modeler' s Apriori algorithm was used to deeply explore users' search strategy combinations under different search intentions. The Apriori algorithm is a frequent itemset algorithm for mining association rules. It uses prior knowledge of frequent itemsets, employs a level-wise search iteration method to find all frequent itemsets that meet the minimum support threshold, then generates association rules from all frequent itemsets, and retains rules that meet the minimum confidence threshold—that is, finds all strong association rules [21]. Existing research on revealing correlation mechanisms mostly achieves this through text analysis and content analysis, so the text mining software ROSTCM was used to conduct word frequency statistics on text data of information encountering under different search intentions to explore "high-incidence" search situations for information encountering.

5 Data Analysis

5.1 Analysis of User Search Strategy Selection Preferences Under Different Search Intents

Single-choice questions in the questionnaire were used to determine users' information search strategy selection preferences under different search intentions. Figure 1 [Figure 1: see original paper] uses UCINET to show the selection of four search strategies. The box in the middle represents the four search strategies, while boxes on the edges represent the five search intentions. Lines between boxes represent selection relationships, with values on lines indicating selection frequency. The higher the frequency, the larger the strategy box in the middle. Figure 1 shows that searching and browsing are the two most frequently used strategies when users seek information.

Table 2 presents the most frequently used search strategies corresponding to different search intentions. For information searching and knowledge acquisition intents, searching is the primary strategy choice. However, for advice consultation, resource downloading, and navigation/URL intents, browsing is the main strategy choice, especially for navigation/URL intent, where users can relatively easily and quickly obtain corresponding URLs or hyperlinks through specific website navigation directory classifications. But for advice consultation and resource downloading intents (such as finding movies) where needs are particularly clear and keywords are easy to extract, searching strategies are used more frequently.

5.2 Analysis of User Search Strategy Selection Combinations Under Different Search Intents

Multiple-choice questions in the questionnaire were used to explore which search strategies users simultaneously employ under different search intentions. To more intuitively present the association relationships between search strategies,

SPSS Modeler' s "web graph" was first used for qualitative association analysis, generating an association model as shown in Figure 2 [Figure 2: see original paper]. In the figure, nodes represent four search strategies, lines between nodes represent associations between different strategies, and line thickness represents the strength of correlation. Taking the advice consultation intent in Figure 2 as an example, the network graph summary shows that the link numbers between searching and browsing, and searching and asking are 253 and 252 respectively, so the lines between them are the thickest, indicating these three strategies have stronger correlations. The link number between browsing and asking is 187, so the line between these two nodes is relatively thick. The link numbers between browsing and tracking, and searching and tracking are 159 and 146 respectively, so the lines between them are thinner. The link number between asking and tracking is the smallest at 138, so the line between these two nodes is the thinnest and almost invisible, indicating that under advice consultation intent, the relationship between asking and tracking strategies is relatively weak.

Although network graph association models are intuitive, they do not generate strict association rules. SPSS Modeler provides professional algorithms for in-depth exploration and mining of data models. This study used the Apriori algorithm in SPSS Modeler for association analysis. The specific process was: (1) Import the data file and set field types as required. The Apriori algorithm can only analyze Boolean data, so all field types were set to "flag" with role set to "arbitrary." (2) Establish the Apriori algorithm model with support set to 10% and confidence set to 80%. Support refers to the probability of events A and B occurring simultaneously, measuring the minimum importance that rules need to satisfy. Confidence refers to the probability of event B occurring given event A, representing the minimum reliability that association rules need to satisfy. The maximum number of antecedents was set to 3. (3) Run and view the Apriori association model results. Figure 3 [Figure 3: see original paper] shows the data mining results of strategy combinations under information searching intent. The same process was followed sequentially for knowledge acquisition, advice consultation, resource downloading, and navigation/URL intents.

From all generated association rules, rules with support greater than 50% were selected. Setting the support threshold too low would generate a large number of association rules. Appropriately increasing support helps mine important strong association rules. The Apriori algorithm generated nine association rules with support greater than 50% and confidence greater than 80%, as shown in Table 3 .

Table 3 shows the high-probability combinations of users' search strategy selection under different intentions. For information searching intent, the support for {searching, browsing} and {searching, asking} are 66.502% and 59.852% respectively, with confidence levels of 81.481% and 91.358%, indicating that when users choose searching strategies, there is a relatively high probability they will also choose browsing and asking strategies. Similarly, the frequent itemset for knowledge acquisition intent is {searching, asking}; for advice consultation in-

tent, the frequent itemsets are {searching, browsing} and {searching, asking}; for resource downloading intent, the frequent itemset is {browsing, tracking}; for navigation/URL intent, the frequent itemsets are {searching, browsing}, {searching, asking}, and {searching, asking, browsing}.

5.3 Analysis of Information Encountering Under Different Search Intents

The text descriptions submitted by respondents about their personal experiences of information encountering were processed using ROSTCM for field extraction and general line-by-line processing. The text describing search motivations was extracted and subjected to word frequency analysis. The word frequency statistics results were displayed visually, as shown in Figure 4 [Figure 4: see original paper]. Larger fonts in the figure indicate higher frequency of vocabulary occurrence.

The above search motivations were categorized into the five types of search intentions defined in this study and their frequencies were counted. The descending order results are shown in Table 4 .

Table 4 shows that when seeking information with clear needs, users often acquire unexpected or low-expectation information to solve existing problems or satisfy interests [22-23]. This information encountering phenomenon occurs most frequently during information searching intent, followed by resource downloading intent. Additionally, information encountering also frequently occurs when conducting advice consultation intent searches on social media platforms (such as Q&A communities, forums, and post bars).

6 Results Discussion

6.1 Regardless of Search Intent Type, Searching and Browsing Strategies Are Most Frequently Selected

CNNIC research reports show that as of June 2019, search engine users reached 695 million, with a usage rate of 81.3% [24]. To some extent, searching has become synonymous with web information seeking. On one hand, this stems from search engines' ability to effectively match user search requests and help users form a "search when needed" behavior pattern. As search engine technology develops toward mobility, personalization, real-time capability, and contextualization, and with new technologies like geo-aware search, multimedia search, and cross-language search being widely applied, search engines perform even better at recognizing user search intentions and helping users answer questions or form understanding of specific issues, making searching the "best practice" between users and information. Another reason for the predominance of searching strategies is users' common query reformulation behavior during lengthy search exploration processes, which also increases search strategy selection frequency.

Browsing strategies commonly occur in two ways: (1) Category browsing, which

uses category directories as intermediaries, where browsed information has clear classification themes; (2) Association browsing, which uses related resources as intermediaries, where browsed information has related themes or revolves around common interests. Regardless of the method, it allows users to navigate from one resource to another in network space, filtering unnecessary information to fulfill their information needs. Browsing strategies have unique advantages in precision and heuristic knowledge innovation, making them equally important as searching.

6.2 Information Searching and Knowledge Acquisition Intents Prefer Searching Strategies, While Advice Consultation, Resource Downloading, and Navigation/URL Intents Prefer Browsing Strategies

Although searching and browsing are basic strategies for user information seeking, differences in strategy selection preferences still exist across different search intention types. Comparing the number of links that searching and browsing nodes have in the network graph reveals that for information searching, knowledge acquisition, and advice consultation intents, searching is the most effective and most frequently chosen strategy. For resource downloading and navigation/URL intents, browsing is the primary search strategy. This mainly results from differences between searching and browsing strategies.

Searching strategy application requires consuming cognitive resources to recall search terms from memory to express information needs and implementing them through search engine tools. Browsing strategies have the characteristic of information traversal—users repeatedly browse "central"websites and explore "related" websites through multiple interactions, multiple cycles, and changing goals, considered tortuous and time-consuming. Therefore, searching strategies better meet the efficiency requirements of information searching and knowledge acquisition intents, helping users obtain information with minimal effort. Browsing, through hyperlink mediation, related resource mediation, and user interactions (evaluation, recommendation, following, discussion, etc.), can clarify relatively vague advice consultation, resource downloading, and navigation/URL needs, helping users efficiently find interesting and suitable information.

6.3 Regardless of Search Intent Type, {Searching, Browsing} and {Searching, Asking} Strategy Combinations Are Most Frequently Selected

Information seeking is a complex system influenced by multiple factors. Different "entry" strategies and subsequent strategy combinations produce different information seeking effects. Meanwhile, the search challenges posed by massive and redundant information require comprehensive search strategies. In fact, searching and browsing cannot solve all information problems—for instance, it is impossible to search or browse for all knowledge of individuals or organizations. Therefore, to achieve "maximum satisfaction," more active search effort must be expended. Searching, browsing, and asking are all active search strategies.

The common strategy combinations of {searching, browsing} and {searching, asking} demonstrate users' dominant position in information seeking activities —they tend to choose active searching rather than passively waiting for information to approach.

The {searching, browsing} strategy combination is most common. Information seeking is typically a cyclical process of "searching → browsing (results)." First, regardless of search intention, the sequence of search engine searching, constructing search terms, browsing pages, and clicking page links is users' conventional pattern for initiating searches. During the search process, if search engine results are unsatisfactory, users modify their queries to optimize search results and continue the "searching → browsing (results)" behavior sequence. This combination pattern, representing a process from rapid intensive searching at the beginning to detailed searching and browsing in middle and later stages, is the most typical search behavior process. The {searching, asking} strategy combination emerges from relationships and interactions in social media, bearing the most significant social imprint. Asking strategies are essentially more conducive to brainstorming and collective problem-solving for specific information needs, and through socialization as an effective information transmission and filtering mechanism, they enhance search effectiveness.

6.4 Knowledge Characteristics Determine That {Searching, Asking} Is the Most Significant Strategy Combination Pattern in Knowledge Acquisition Intent Searches

Knowledge acquisition intent is a deep-level informational intent—it is not only about scanning, locating, and discovering knowledge, but also a series of learning explorations and interactions. Its implementation path often involves the comprehensive application of searching, browsing, asking, and tracking strategies. In the early search stage, users search with low frequency and browse many web pages to discover complete topic knowledge. Later, they frequently change search strategies and browse search results carefully to form systematic knowledge structures. As the search process deepens, users may choose asking to evaluate and exchange knowledge understanding, and maintain knowledge reserves through tracking to address continuously emerging information problems.

In addition to knowledge acquisition intent having the characteristic of diversified strategy selection, the {searching, asking} strategy combination reflects the integration of human-computer interaction strategies and interpersonal interaction strategies in knowledge acquisition information seeking. When knowledge exists in encoded forms such as graphics, text, and formulas, searching strategies are simple to operate and respond quickly, allowing users to obtain expected search targets with minimal searching and simplest keywords. However, when knowledge exists in forms such as individual experience, feelings, consciousness, judgment, inspiration, and creativity that are difficult to express and transmit, searching or browsing strategies appear inadequate for acquiring such informa-

tion. The asking strategy, representing interpersonal interaction, can better leverage its strengths to conduct more targeted knowledge searches.

6.5 {Browsing, Tracking} Is the Basic Strategy Combination Unit for Resource Downloading Intent Information Seeking

Resource downloading intent generally includes two levels: (1) Acquiring a specific resource; (2) Receiving and utilizing a target resource that has been identified. Resource downloading intent is closest to information use, mostly occurring in the evaluation and selection stages of later search phases, where user uncertainty is reduced and the advantage of search engines' full-network rapid matching is difficult to manifest. Instead, browsing strategies can filter out unnecessary information and more effectively act on resource selection, adjusting preset goals through information use until target resources are obtained.

The reason {browsing, tracking} strategy combinations frequently appear in resource downloading intent information seeking is that resource downloading intent is often difficult to satisfy effectively through a single search, manifested in the insufficiency of acquired resources in terms of quantity, quality, breadth, and depth. The dynamic development and changes in task situations and resources themselves simultaneously deepen this "insufficiency confusion" and "desire for sufficiency." Therefore, users maintain a long-term tendency and sensitivity toward this resource need, capturing relevant information when it appears—this is the tracking strategy in resource downloading.

6.6 {Searching, Browsing, Asking} Strategy Combination Occurs in Multiple Search Situations Where Navigation/URL Intent Resides

Navigation/URL intent is the direct intention to search for specific websites or website pages containing sufficient navigation information. When executing searches, users have already formed search intentions in their minds, knowing or believing that URLs exist that can satisfy their information needs. Therefore, this type of search intention is relatively simple, and multiple strategies can search effectively. The application of {searching, browsing, asking} strategy combinations is related to the special nature of navigation/URL intent in users' search intentions.

On one hand, information searching intent may transform into navigation/URL intent due to information screening or aggregation needs. For example, the search path iPhone XR → Apple official website → Apple XR official introduction demonstrates the transformation from information searching intent → navigation/URL intent → knowledge acquisition intent. Meanwhile, searches for resource downloading, knowledge acquisition, and other intents usually also require navigating to a specific website first. For example, users' search activities of entering "Driver Home" in the search box → Driver Home website to find specific drivers → downloading drivers demonstrate the transformation from navigation/URL intent → information searching intent → resource download-

ing intent. It can be argued that navigation/URL intent is often the source or bridge for other intents. The {searching, browsing, asking} strategy combination occurs in the multiple search situations where navigation/URL intent resides, such as further searching after browsing recommended content; or when users experience cognitive fatigue after long-term searching and cannot accurately determine web information location, they use asking to assist evaluation while quickly ending the search; or browsing search result sets one by one after keyword searching.

6.7 Information Searching, Resource Downloading, and Advice Consultation Intents Easily Trigger Information Encountering

Encountering is a passive search strategy lacking clear purpose but also an important information acquisition method. M. J. Bates [6] once estimated that over 80% of information people obtain is accidentally discovered in daily activities. Existing research shows that information encountering is influenced by individual differences and environmental characteristics, but encountering occurrence does not require information needs as a prerequisite [23]. This study' s finding that certain specific types of search intentions are more likely to trigger information encountering apparently contradicts this. A possible explanation is that this relates to this study' s classification of search intentions—information searching, resource downloading, and advice consultation intents represent the most search situations, so the probability of encountering naturally increases. Another reasonable explanation is that encountering occurrence is related to the frequency of user operation behaviors. For example, information searching intent involves frequent query submissions and more session numbers, resulting in higher encountering probability, while navigation/URL intent involves few clicks, resulting in lower encountering probability. Additionally, the situations where respondents described encountering under advice consultation intent were all related to social media interaction, indicating that social media facilitates social navigation and information exploration and can effectively support information encountering.

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