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Users' Searching Behavior for Academic Papers

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Abstract. In order to improve academic information retrieval systems, we focused on users' searching behavior for academic papers. This paper described about the results of two studies; the observation study and the questionnaire survey. In the observation study, researchers were asked to use an academic information database. Elements they checked in the search results for document selection were examined. In the questionnaire survey, participants were researchers and students. The purpose of the survey is to find general searching behavior for scholarly search such as where users obtain academic papers, in addition to examine whether the results of observational study are general or not. As the results of these studies, the following items were found. Researchers use not only the commercial academic bibliographic databases but also information retrieval systems that are easy to access full text version articles, for example, digital libraries provided academic associations and Google Scholar. In the document selection from the search results, they use other than general bibliographic items such as PDFs of full text versions. There is a difference searching behavior between researchers and students.

Keywords: Document Selection, Scholarly Search, Academic Retrieval System, Searching Behavior.

1 Introduction

Academic information databases such as Web of Science and Scopus has been introduced for a while and hybrid types of academic information resources, for example, e-journals and Google Scholar also have been developed in recent years. Many people might think search engines are enough even for search academic papers. However, scholarly search has a different characteristics compared with everyday life search. The main purpose of scholarly search is to confirm an originality of researchers' own research or to find appropriate methods for solving their research question, which is comprehensive search. Nowadays, many searching tools and community tools for searching and sharing academic papers are proposed. The environment of scholarly search continues to change. It is time to re-examine what system is good for scholarly search. The purpose of this research project is to improve information retrieval systems for academic papers. We focus on searching behavior on scholarly search.

In this research, we conducted the observational study and the questionnaire survey. In the observation survey, we asked researchers to use an academic information database, and then investigate that what elements in the research results they check for document selection to read the full text version. As the next step, we conducted the questionnaire survey to clarify searching behavior on scholarly search and to examine to obtain same conclusion with results of observational study using the survey.

In the remainder of paper, the observational study is described in Section 2 and the questionnaire study is described in Section 3. We will discuss characteristics of users' searching behavior for scholarly search in Conclusion.

2 Key Elements in Search Results for Document Selection

2.1 Observational Study

The proposal of this study described in [1], and then the outline of the study and the preliminary results were introduced in [2] and the results of the survey were reported in [3]. The summary of the study is described here. The observational study consists of following steps; 1) pre-interview, 2) search session conducted by participants, and 3) follow-up interviews. In the search session, participants were asked to search academic papers they want to read using any information retrieval systems or search engines and describe which elements they were checking from search results and reasons for selecting particular documents. They allowed to stop searching when they were satisfied with the results. If we miss elements and reasons during the search session, we asked them in the follow-up interview. We conducted the study with 10 researchers (five faculty members and five doctoral students) from November 2015 to September 2016. The average time they spent was 2 hours, with a maximum of the full 3 hours and mini-mum of 1 hour.

2.2 Results

We analyzed which elements were checked, categorized patterns of order of checking elements and then identified mainly two patterns. We found that titles and abstracts are primary elements, and participants checked title, followed by the abstract. These two elements were also identified in other studies [4, 5]. As second pattern, participants accessed document (full-text versions) without making a selection decision. Some participants belong to this pattern selected documents from among references. Other participants in this pattern checked figures in the full text. We also found a unique way a participant used Google Image to find specific devices related to his/her device. This is a new finding for this research. These results indicate that references, figures, and/or images from full-text versions are also important elements for document selection decisions. Decisions were also based on the online availability of the full text.

3 Selection of Information Resources

3.1 The Questionnaire Survey

For the survey, 14 question items were developed based on our findings [2, 3], inquiring the type of databases used daily, order of checked elements in research results, and frequency of use of functions of academic databases. We asked researchers, Ph. D. program students, and master's programs students from the school of engineering in two national universities in Japan. A student in a Ph.D. program is considered as a researcher. Informed consent was obtained from each respondent. We conducted the questionnaire survey from October 20th to November 10th, 2017, and then obtained 88 respondents (48 researchers and 44 master's program students).

3.2 Results

The results correspond to two question items were shown in [6]. As other interesting results, researchers use not only the commercial academic bibliographic databases but also information retrieval systems that are easy to access full text version articles, for example, academic digital libraries and Google Scholar. For example, researcher use different information resources such as Google Scholar, digital libraries run by academic associations, and Web of Science. They also use different information resources at different research stage (stage of beginning research, stage of considering appropriate method, and stage of writing paper). On the other hand, students always use a specific information resources. Our findings that there is a difference searching behavior between researchers and students.

4 Discussion and Conclusion

As the results, the following items were found from two surveys. In the document selection from the search results, they use PDFs of full text versions. Researchers use not only the commercial academic bibliographic databases but also information retrieval systems that are easy to access full text version articles, for example, academic digital libraries and Google Scholar. There is a difference searching behavior between researchers and students.

These results indicate that researchers flexibly respond to changes in academic information retrieval systems and users prefer to check rich information such as text version, image, graphs, and tables in the full-text than general bibliographic items. It would be helpful to users to show rich information when they select documents from search results. On the other hand, it is important to train users who have a lack of knowledge about academic information resources and research process.

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