

Sharing Knowledge and Experience of Search with SNS

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Abstract: The investigation activities using a search engine are indispensable to acquisition of new knowledge. When we investigate using a search engine, we leave a memo if needed, seeing the search results to an input keyword. Depending on the case, search refinement and search by a new related keyword are repeated. However, it is difficult to share the knowledge and the experience acquired under investigation activities with the others. On the other hand, SNS which promotes relation with people and a person attracts attention. This paper proposes a community type search platform which combines a search engine and SNS. By seamless use of various activities in search and the mutual comments, users can share a problem or new knowledge.

Keywords: SNS, Search, Community, Knowledge Share.

1 INTRODUCTION

With the development of internet, SNS (Social Network Service) plays a more and more important role on affecting interpersonal relationships. As typical SNS systems, Mixi has the largest number of members in Japan; GREE can support the mobile devices; Facebook is the most popular SNS in the world.

These SNS systems have become community Web sites that can broaden the relationship among person and person. Therefore, the researches on SNS have increased recent years. For instance, the authors of paper [1] take user's friend as a middleman, and proposed a chat system on circle of "user", "user's friend" and "friend of user's friend". The circle of "friends of friend" provides a chance to create new relationships, in order to sharing knowledge among all of friends.

In addition, when we try to investigate something, we always open a search engine, enter some keywords and click the "search" button. There is no doubt that search engine has become an indispensable tool for the current Internet users. Especially, with the increasing of the search engines which provide search service for documents of education and research, new issue or knowledge can be discovered in search activity. Sometimes we need to make a memo to record the discovery or our comment of search results. These memos may contain some important and valuable information. Therefore it is useful to share our memo and read others' memo.

Textbook is not the only way to obtain knowledge. We can also discover new knowledge during our search activity. In order to share the knowledge discovered in search activity, we propose a novel search engine called SNSearch (Social Network Search). It combines the SNS and search engine together. It help user to make memo easily and record user's search history automatically. It makes use of the relationship among persons, which was created through SNS, to share the knowledge to each other.

Our main purpose is to provide a new approach to help users share and obtain new knowledge expediently. In this paper, we consider the researchers as our chief users. The researchers can freely add new friends who may have similar interest. They can use the SNSearch to search papers and make memo. They can also read their friends' memos and search history. Thus the users can easily share and obtain new knowledge among their friends. By doing this research, we expect to affect the future prospects of the current search engines and SNS.

2 RELATED WORK

There are several researches in using access log of Web pages. Nakao et. al. [2] uses access log of a Web pages of each user to calculate the similarity of Web pages. They proposes a recommendation method of Web pages based on the similarity. They considered not only the similarity of Web pages but the similarity between sub-trees. They combined this similarity and the similarity by link structure.

Toda et. al.[3] paid attention to the Web pages visited often by many users to improve the efficiency of Web browsing routines and to discover new information at the same time. They analyzed the time and frequency of users visit to particular pages in their access log, to evaluate the importance of the pages for recommendation. They applied the collaborative filtering for Web page recommendation.

Liao et.al.[4] considered a mentoring system in WBT(Web Based Training) system. They analyzed the learning logs of students and formulated evaluation measures to capture the students feature. They constructed

an "evaluation referential graph" to detect abnormal status of students. When such state is found, the system can alarm to keep students learning motivation.

So far qualitative analysis is attached great importance. Recently, the learning logs are attracting many researchers to help communication between users. Totoda et.al. [5] used the activity logs of runners in creating regional and focused communities of runners. Any member can read and comment the training plan of other members. So, participating member of the community can share and learn from others activity logs even if they have few experience.

Watanabe et.al. [6] used collaborative learning logs, where participants form a team to solve the same problem. They evaluated the number of users who made the same annotation in their utterance, and constructed a knowledge graph. They claimed that the graph is useful to point out the key issue for learners.

Anderson et.al. [7] designed and implemented the montage system to improve the experience for routine web browsing that users tend to repeat over and over in similar situations by providing a start page. The start page shows an ensemble of links and content based on a user's browsing history and preferences.

From these studies, we understand that users' logs are useful. However, there is no trial that connects search activity and SNS. The present paper seems to be the first one as far as authors know.

3 WHY SNSEARCH

3.1 Search and knowledge

Why do people search? A simple reason is that they want to know something that they do not know. Today, with the developing of internet, searching is a natural behavior like listening, speaking, reading or writing. There are many reasons for people to use search engine. Sometimes people use search engine to find something they are interested in. Sometime people use search engine to find some methods to solve some problems or do some studies. No matter why they search, people can learn some knowledge by their searching behavior. Different people use different keywords to search different things, and choose different results with different reasons. But, it is possible for different people to have the same characteristics such as interests, research, task, and purpose. In this kind of situation, sharing the experience of search can help people to learn something from other people who have some characteristics.

But, how to share the experience of search and the knowledge learned from search? In order to solve this problem we designed a system named SNSEARCH which combines search engine and a simple SNS system.

3.2 The main idea of SNSEARCH

In this paper, we designed a search engine of papers collected from IEICE technical report. By combining it and SNS communication ability, we provide the SNSEARCH system as a community portal to provide a platform with which people can share his knowledge and learn something from others'. As show in the Figure 1, the main idea of this system is that people can give something and take something by accumulating user's search record, and doing a memo of knowledge found from search behavior and some comments about the search behavior.

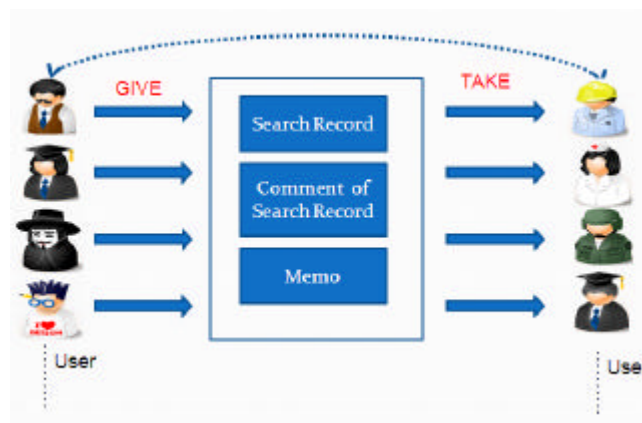


Fig. 1. The main idea of SNSEARCH

4 OUTLINE OF SYSTEM

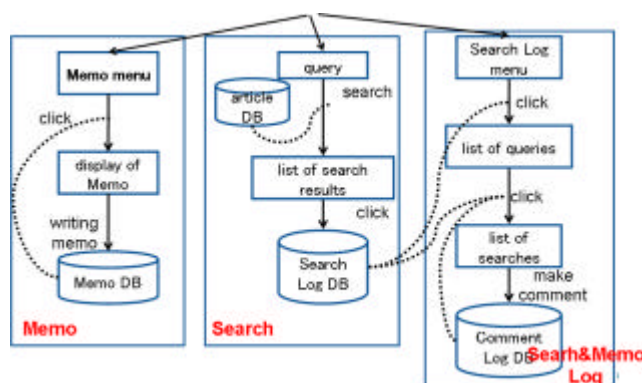


Fig. 2. System

Fig. 2 shows the outline of the system, which consists of three components -- Memo, Search and Comments Log. We used the abstracts of 42,921 articles of IEICE(the Institute of Electronics, Information and Communication Engineering) to create a search engine. The search engine can be substituted with other engine. We call the system as SNSearch, since it combines SNS and Search. The

system keeps query logs of users in its database to help sharing the process of search between users. User can see, learn and comment on other search experience and on the search result. The system returns the search results for the query as an ordinary search engine does. When a user chose and clicked a result, the system keeps this behavior as users' preference. The queries and choices of one user can be used as knowledge for other users. Conventional SNS provides a communication environment to participants of the community. In SNSearch, user can give not only their opinion or comment, but also their experience of search. Moreover, they can comment on search process of other members.

5 FUNCTIONS OF SYSTEM

The present version of SNSearch has the following 8 functions.

- (1) Writing memo
- (2) Displaying the latest 10 memo
- (3) Displaying memo of each member
- (4) Search engine of articles
- (5) Displaying memo according to date and time
- (6) Displaying members' queries
- (7) Displaying the action for the search result
- (8) Making comments on members' search logs



Fig.2 Listing of Memos

When a user logs in to the system, he can choose the contents to be displayed from his own memo, the latest memo of all members and the search logs. When memo menu is chosen, the latest memos of all members are shown in order of time (Fig. 3). The list of friends is always shown in all modes. When the own memo is selected, he can read and write the memo (Fig. 4). If a user wants to check the memo of his friend, he only has to click the name of the friend on the list. A simple click on a query (Fig. 5) can activate the search and re-display the result which his friend checked (Fig. 6).



Fig.3 A user's Memo



Fig.4 Listing of Queries



Fig.5 Search Interface

6 EVALUATION PLAN

The key feature of the proposed system is in the combination of a search engine and SNS. The interface of the system, however, influences whether the system is useful and convenient. In the rest of the paper, we analyzed the precedence studies to consider the frame work of evaluation. It turned out that there are two kinds of approaches, i.e., questionnaire by users and comparison of performance as search methods.

Specifically by the previous work, the following evaluations are performed. In [1], the questionnaire survey about an opinion and comment of a system was conducted to 11 users and was used for evaluation. In [2], the browsing logs of 11 users were used to recommend non-visited Web pages. The success ratio of arriving non-visited pages were used as the evaluation score for the method. Toda et. al. [3] used the decrease of users' clicks as the effectiveness of recommendation method for a user to reach the target Web page. In [4], the users are asked to use their system, and then answered the prepared question. Then the questionnaire survey was conducted to obtain the evaluation. In [5], two experiments were performed to compare their system with a conventional community site. In [4], four students were asked to solve three problems of Java programming, where students comprehension was formalized as "knowledge graph".

The authors made a brief hearing of users as preliminary evaluation. The main interests and reaction of users were convenience of an interface, flexibility of a system and whether users can share their knowledge which would be gained when they are actually using our system to explore their problems. We are planning the tasks to be solved by users in our experiment and the questionnaire to analyze these three points.

7 CONCLUSION

In this paper, we designed a search engine of data collected from IEICE technical report, which is different from traditional search engine. The difference is that the result of search is not only links of papers but also can save search log automatically. We combined it with a simple SNS system to provide a community portal, with which people can share their knowledge got from search behavior and learn something from others'. And we gave a detailed account of this system which has three components -- Memo, Search and Comment Log.

This time, we just gave an idea that people can share knowledge with each other by share combining SNS and Search. How to make it more available? How to make it more acceptable? In order to solve this kind of problem, some improvements of this system need to be considered.

As the next step of this study, we are planning to design an Information Recommendation Model to make

it easy for people to find something they are interested in. By accumulating user's record of using the Information Recommendation Model, we plan to conduct an experiment to evaluate the effectiveness of the system.

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