On a Tip of Your Search: Evaluating Effect of Search Tips for Complex Informational Search Tasks

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ABSTRACT

Search engine is a ubiquitous tool used by millions of people on a daily basis. However, as with every tool, certain skills are required in order to use it efficiently. Unfortunately users have different experience and not everybody is able to find answers to all questions she is interested in [find a paper to cite here]. Helping users to develop their search skills was included as one of the key research directions by [2]. However, the assistance offered by the modern search engines are limited to query suggestion and spelling correction [something else?]. A number of researches are available that study different ways of helping users be more successful with their searches [cite some reviews, or a couple of different papers]. In this work we study the effect of showing users search tips designed to help asking the better queries when solving a difficult informational search task. We show that "the right" tips can improve users' success rate. However generic hints might be misleading and detrimental to user search experience.

Categories and Subject Descriptors

H.3.3 [**Information storage and retrieval**]: Information Search and Retrieval—*query formulation, search process*

General Terms

Measurement, Design, Experimentation, Human Factors

Keywords

User studies, search interface, experimental design, effectiveness measures, query reformulation, expertise, tactics, tips, suggestions, assistance, efficiency.

1. INTRODUCTION

Motivation of search hints as alternative/addition to query suggestion, especially for tasks when search cannot be solved with a single query

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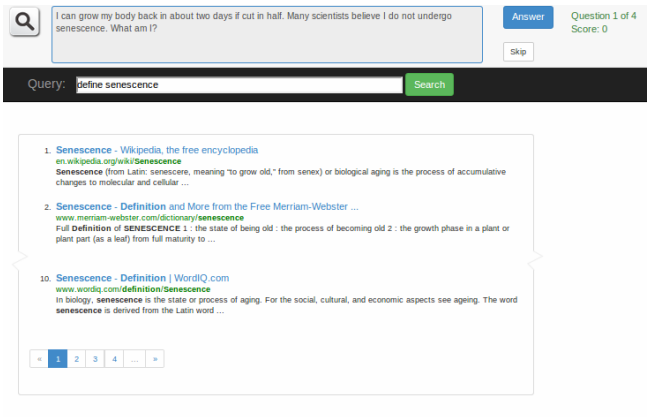

Figure 1: The interface of the UFindIt game

Improving user search experience is usually considered as a problem of improving retrieval performance.

Query suggestion is similar to tips, but is not guaranteed to be good, usually rely on more behavior data available for the new query

Query terms selection

Other dialog systems?

Showing predicted retrieval performance

Search snippets

2. RELATED WORK

Based on related work review from Daniel Russel [3].

Summarize works on task level query suggestion Experiment Design State main difference from Dan Russel paper: we focus on informational tasks which are solved with web search and hints are less likely to be 100% helpful

3. TIPS FOR DIFFICULT SEARCH TASKS

3.1 Web Search Game

First part is about the uFindIt game with screenshot To estimate the effect of search tips on user behavior and success we used the uFindIt game, proposed in [1]. The goal of the game is to find the answers to given search tasks using the provided web search interface.

The interface of the game is presented on Figure 1.

3.2 Search Tasks Description

Describe and give text of search tasks used in the study, mention that they came from agoogleaday

Table 1 provides text for all 4 tasks presented to the user as well their solutions. As you can the tasks are quite difficult and usually involves more than one query to solve them.

3.3 Experiment design

describe the setup, groups and search tips given

4. RESULTS

Provide raw results of the experiments, e.g. how many participants, how many HITs accepted, rejected, problems. Show examples of search trails for successful and unsuccessful searches.

From 199 participants, who accepteed the HIT on Amazon Mechanical Turk[1], only 169 moved further than the rules of the game and got to the first questions. The search tasks were difficult and some players decided to quit the game, thus only 90 players finished the game, from those there were 9 submissions which we filtered out from the future analysis. The only 2 reasons for that were: lack of effort, e.g. some players skipped several tasks after only a single query; some other submissions indicated usage of external resources such as outside of the game search engine, e.g. the only query asked was the correct answer to the task. From 81 submissions 10 players indicated in the survey that they didn't see the hints which were shown to them, so we further filtered those submissions and finally we had 71 completed games, which split into the groups of 29, 20, 22 for players who didn't have hints, who had task-specific hints and who had generic hints correspondingly.

4.1 Analysis

Give a table and a couple of pictures with main quantitative results

Figure 2 shows plots of the correct answers rate per task for groups of users who saw no hint, specific task-oriented hint or generic hint. As we can see, success rate is higher for users who saw specific hint than no hint at all. Somewhat surprising is the fact, that users who saw generic search hint were slightly less successful. The difference is more significant in more difficult tasks 1 and 4.

The main findings can be summarized as follows:

- "Correct" search tips allows users to find correct answer more often and do this faster than without search tips
- "General" search hints can have detrimental effect on search success, reducing the success rate and increasing the time spent on task

5. DISCUSSIONS AND FUTURE WORK

Make a conclusion by summarizing the findings one more time

Speculate on the negative effect of general search hints - distracting? hard to follow?, less satisfaction when tips were shown - self satisfaction?.

6. ACKNOWLEDGMENTS

Thanks to Dan Russel for sharing questions.

[1]http://mturk.com/

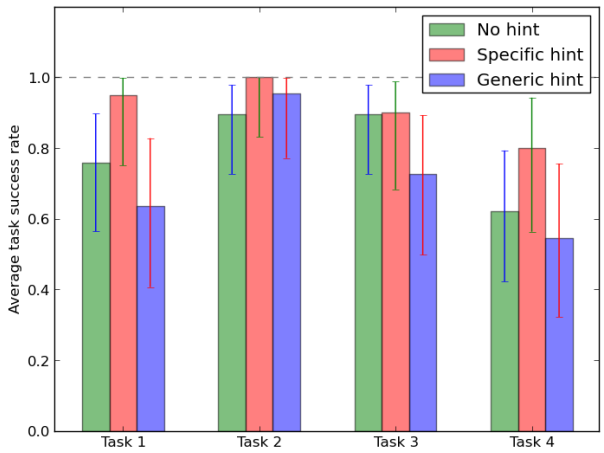

Figure 2: Success rate per task for each group of participants

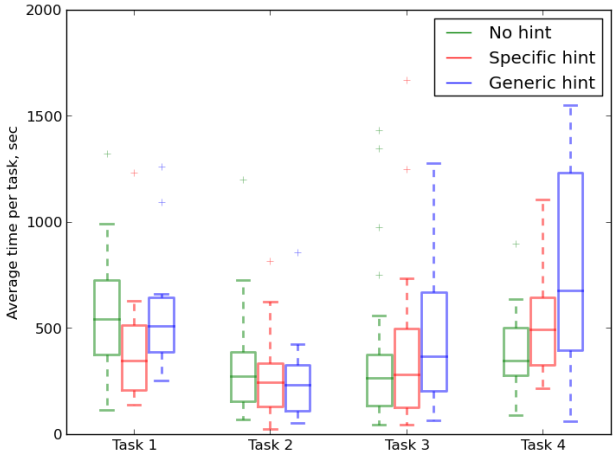

Figure 3: Task completion time for each group of players

Table 1: Search Tasks Given to the User

Task Text	Solution
I can grow my body back in about two days if cut in half. Many scientists believe I do not undergo senescence. What am I?	Search [regenerative animal]. This will yield a number of possibilities including starfish, salamanders and several others. Search [senescence]. Find out that it means "biological aging". Search [animal biologically immortal], and learn that the hydra supposedly fulfill both of the above criteria.
Of the Romans "group of three" gods in the Archaic Triad, which one did not have a Greek counterpart?	Search for [Archaic Triad] to find Jupiter, Mars and Quirinus. Among those Quirinus didn't have a Greek counterpart.
As George surveyed the "waterless place," he unearthed some very important eggs of what animal?	Search for [waterless place] to find out that it is the translation of the Mongolian word "Gobi" or "Gobi Desert." George Olsen unearthing the first whole dinosaur eggs in 1923.
If you were in the basin of the Somme River at summers end in 1918, what language would you have had to speak to understand coded British communications?	Search [somme river basin 1918]. Find out that's when the Second Battle of the Somme (a WWI battle) took place. Searching [second battle of somme code language] reveals the Cherokee served as code talkers in battle. They relayed messages in the Cherokee language that Germans couldn't decipher.

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