

Search Engines' Help Systems

Yun-Ke Chang
Miguel A. Morales Arroyo
School of Communication
and Information
Nanyang Technological
University, Singapore
ykchang@ntu.edu.sg
osornoyk@yahoo.com

Amanda Spink
School of Information
Systems
Queensland University of
Technology
Australia
ah.spink@qut.edu.au

Myat Thu Aung, Kyaw Thu
Ya Lwin
Zaw Win Htike
Nanyang Technological
University, Singapore

Abstract

The HELP information provided by search engines can facilitate its user's information seeking process or hinder it. This study analyzed 20 search engines on how their HELP Systems are placed and organized. Help systems are separated into pre-search help system, and post-search help system, and six aspects of help systems were investigated, including navigation, design elements, technical help, conceptual help, terminological, and strategic aspects. A general taxonomy of existing help systems of search engines is provided as the result. The proposed taxonomy may be used as the framework to develop questionnaire for further study in stereotyping search engine users.

Key Words- Help Systems, Human Computer Interaction, Search Engine, Online Help, Taxonomy.

1. Introduction

Increasingly, IR systems provide users with intelligent interfaces that represent some of the knowledge and functions of a human intermediary to help interactive information search formulation and refinement [1]. This aims to make information retrieval process easier and more convenient for the end user. Oftentimes the help system may be the only resource that users can consult when they face problems during searching process, such as using Internet search engines.

Every user of web search engines may need help at one time or another, whether to find directions when they're lost or to learn about how a particular search feature works. For a web search engine to be considered a success the HELP systems must serve users' needs in an effective and efficient manner; therefore, the design of its content, layout, and navigation

scheme should be taken into serious consideration.

In computer-based environments, help seeking is an essential and important part in terms of self-regulated learning [2]. To be able to retain their web traffic and popularity, most search engines improve their search performance by providing assistance features like clustering, find similar, advanced search pages, search by language, search within, etc. However, non-expert users usually use limited simple search assistance features; which indicates their lack of knowledge of those advanced assistance features and how to use those [3].

Since HELP Systems becomes a standard feature of almost all IR systems, the effective use of help facilities has been subject of debate where recent research shows an inefficient use or even ignorance of HELP Systems [4]. While many studies have been done with general IR systems, there has not been a comprehensive investigation in the search engines' Help system in spite of its importance in finding information on the Web.

The focus of the paper is scoped around the analysis of Help functionality of selected 20 search engines in terms of how their help systems are placed and organized, and the features and content of their Help systems. The result of this research should benefit both search engine users and developers by shedding some light on current search engines' help mechanisms.

There are other design issues that help users be more informed of finding information in better ways. The users might not want go into too many clicks to find the information they want; however, this aspect of the help systems was not evaluated. We did not evaluate the quality of the information, either. While some help systems appear to have too much unnecessary information and some redundant features, we consider this type of judgment will

be too subjective and decide to leave those areas alone.

2. Related Study

Today's web search engines may provide various features to assist users looking for relevant information. Studies have reported that most users usually do not use special search features, in which more criteria can be specified to narrow down search results, such as the desired currency of web pages, specific domain, or the file format for image retrieval [5]. People look for images may not click on 'Image' search; instead, they type the text 'image' into the query box. While search engines may have different algorithms to effectively retrieve text, images, videos, or audios, and often open up different query windows for different media type, users often times utilize the main search pages only [2].

Few studies have been done in using help functions of search engines. Spink and Jason found that users sought more systems assistance when looking for images and videos [6]. Similar to other type of help mechanism in all kind of information systems, the design of search engines' help mechanism should promote help seeking as a process of "self-regulated learning" [7]. Therefore, in our study, ease of navigation, content of information available, and interface design are considered important factors affecting whether users can find information or are willing to use the help system at all.

Studies about help systems of IR systems can provide us a framework in investigating help systems of search engines. Recently, researchers have given much focus on Natural Language Processing (NLP), with focus on instruction and explanation, which advocates design IR system that communicates with users by means of natural language [8]. NLP researchers also suggest that the most common instruction to use is the "*use plain English*", or to "*ask a question as you would ask a friend*".

Our study, therefore, also focuses on the instructions and explanations power of search engines' help mechanisms. It is easy to see that instruction should be given before a search process is initiated, and explanations should be included in the search results so that users might refine their query or search strategies if the result is not as desirable as they expected. Thus, it is reasonable to break down the search engines' help mechanisms into pre-search help system and post-search help system. The following

methodology section will have more details about how we surveyed the 20 search engines' help systems.

3. Methodology

This study analyzed 20 English search engines' help systems (see Table 1.). They are search engines of different kinds, including general search engines, corporate types, portal types and some special search engines. The data was collected during September 2007. Pre-search and post-search help systems were roughly defined for guiding our investigation.

Table 1. Search engines investigated and their URLs.

1.Google (http://www.google.com/)
2.Yahoo (http://www.yahoo.com/)
3.MSN (http://www.msn.com/)
4.Live Search (http://www.live.com/)
5.Altavista (http://www.altavista.com/)
6.Ask.com (http://www.ask.com/)
7.Lycos (http://search.lycos.com/)
8.Big-search(http://www.big-search.com/)
9.Mamma (http://www.mamma.com/)
10.Exalead (http://www.exalead.com/search)
11.SearchKing(http://www.searchking.com)
12.Qango.com(http://www.qango.com/)
13.Infoplease (http://www.infoplease.com/)
14.Alltheweb (http://www.alltheweb.com/)
15.iWon (http://www.iwon.com)
16.WebCrawler(http://www.webcrawler.com/)
17.GigaBlast (http://www.gigablast.com/)
18.Aeiwi (http://www.aeiwi.com/)
19.Links2Go (http://www.links2go.com/)
20.PepeSearch(http://www.pepesearch.com/)

Pre-search HELP Systems are defined as the systems that provide users with instruction of search mechanism so that users can begin to conduct search with less difficulties. In order to do this, we make potential break down of pre-search HELP Systems into:

1. Navigational analysis – the number of levels of user help assistance in each help search mechanism, where each mouse click or information screen is considered a new level.
2. Part analysis - different design elements and metaphors making up for the HELP Systems including the terminology used. For example, availability and use of design elements (e.g. scroll bar and

hyperlink, etc) at the different levels of assistance.

Most search engines investigated are meant for general web users, and they often have different ways and description to present pre-search information to users. Therefore we studied on both the Home search page and the Help page as well, for users may seek help before a search activity starts.

Post-search HELP Systems are those which provide help dialogues to clarify and explain what the user search results means and suggest other available advanced functions for users to narrow down their search results. If users encounter null answer, the system should provide possible reasons and give suggestions.

The following aspects [9] are evaluated.

1. Technical Help – enables users to interact with IR systems in an effective and efficient way. E.g. highlighting the role of a certain control option.
2. Conceptual Help – supports users to overcome problems that pertain to the information seeking process.
3. Terminological Help –created from different aspects to help users to understand the use of technical terms.
4. Strategic Help – provides sequence of search statements that allows users to classify, check and reduce retrieved document sets.

4. Results

This part we will present taxonomy of help systems investigated. We will also report on the overall features observed in the twenty selected search engines' help systems, divided into pre-search and post-search help systems.

4.1. Overall features

From the investigation of the selected twenty search engines, the following taxonomy is our attempt to map out those HELP Systems by describing the help structure layout and the information provided. The HELP System structure is put together with hierarchy approach and divided into three main categories; Structure, Navigation and Content.

Under the Structure, the first sub-category is the page layout, which is how the information is displayed in the help page and the ways information is arranged. The second one is information flow, which generally utilizes a tree structure. The third is the design components

which help to identify the information and assist in navigation. The last subcategory is all the colors used for the grouping information which help the users understand the structure and assist them finding different help information easily.

From the Navigation point of view, there are two main features of the navigation bars that assist users to locate help information; first one is about navigation bar Location and the second one is the Style. The first one consists of locations including *left hand side*, *right hand side* and *top*. The later one generally is the *Breadcrumb* to help the user know their location on the HELP System, which can prevent users from getting lost.

The Content part is divided into Functionality Help Guidelines, Help Guideline Styles and Others.

The primary part of the Content is entirely for help guidelines in different special search functionalities, which are comprised with text search, image search, audio search, movie search, people search, news search, stock search, stopping search, dictionary search, blog search, weather search and book search.

The second part is Guideline Styles; there are mainly two categories-- Explanations and FAQ sections. The foremost explanation parts are about Basic/ Advanced Search and the Search Results. The features include Text descriptions, Image descriptions, some Examples and their Useful Links. In FAQ part, there are basic/ advanced questions and answers; in general only Text Description is used to express questions, while in the answers there are other types of descriptions, including text descriptions, image descriptions, examples and their useful links. Another part under FAQ is expressed as Knowledge Base which usually contains different topic categories.

The third part under Content is described as Other. They are Preference settings for the users to customize over their search functionalities, result outputs and the way the users act with search interface. All the information about the company, and product and services provided by the search engine are classified as About. The last part is the Help Center, which consists of other products and tools' help guidelines.

4.2 Taxonomy developed

- I. Structure
 - A. Page layout
 1. Header and slide
 2. Header, footer, and slide
 3. Horizontal split
 4. Vertical split
 5. Top down hierarchy
 - B. Information flow
 1. Tree
 - C. Design Component
 1. Scroll bar
 2. Panel
 3. Hyperlink
 4. Image
 5. Button
 6. Text box
 - D. Color
 1. Black
 2. Light blue
 3. Purple
 4. Orange
- II. Navigation Bar
 - A. Location
 1. Left hand
 2. Right hand
 3. Top
 - B. Style
 1. Bread Crumb
- III. Content
 - A. Functionality Help Guidelines
 1. Text sarch
 2. Image search
 3. Audio search
 4. Movie search
 5. People search
 6. News search
 7. Stock search
 8. Shopping search
 9. Dictionary search
 10. Blog search
 11. Weather search
 12. Book search
 - B. Help Guidelines Styles
 1. Explanation
 - a) Basic/Advanced Search--
Help Function title--Subtitle
 - (1) Text description
 - (2) Image descriptions
 - (3) Examples
 - (4) Useful links
 - b) Search Results
 - (1) Text description
 - (2) Image descriptions
 - (3) Examples
 - (4) Useful links
 2. FAQ
 - a) Questions
 - (1) Text description
 - b) Answers
 - (1) Text description
 - (2) Image descriptions
 - (3) Examples
 - (4) Useful links
 - c) Knowledge Base
 - (1) Categories

- C. Others
 1. Preference setting
 2. About
 - a) Company
 - b) Product
 - c) Service
 3. Help center
 - a) Other products and tools Help guidelines

4.3. Pre-search help systems

Different ways of helping users are found; however, most of the search engines have a general HELP System like how to find different kind of file types, choosing different filtering options and so on. Table 2 lists the results of analyzing those twenty search engines' Pre-Search HELP Systems.

Table 2. Pre-search Help Systems

Search Engine Name	Help Icon	Navigation				Component				Technical Help		Conceptual Help	Knowledge Help	Storage Help	Recent Suggestions	Powered By
		Horizontal	Vertical	Button	Panel	Text Link	Image Link	Text Box	Scrollbar	FAQ	Instruction					
Google																
Yahoo																
MSN																Use Search
Live Search																
AltaVista																
Ask.com																
Lycos																Ask.com
Big-search																Google
Mamma																
Exalead																
SearchKing																
Qango																
Infoplease																
Alltheweb																Yahoo
Wot																Ask.com
WebCrawler																
GigaBlast																
Actel																
Link2Go																
PeepSearch																Google

PRE-SEARCH HELP SYSTEMS

For the Pre-Search HELP System, the basic search pages were examined. It was observed that links or icons connecting to the main Help pages were not available even on some popular search engines' home pages. Navigation wise, most of the help contents on the help pages are arranged in a hierarchical order, and some of them also provide breadcrumb for better awareness of a user's location on the search engine's site. Different design component are used, but most search engines prefer text links for further explanations. Some of them provide image links and buttons, and text boxes were observed as well, depending on the complexity of the HELP System. Panels are used by the Yahoo Help system to group the similar information, which may greatly help the users in locating related information. However, Yahoo is the only case.

Almost all the search engines' HELP System provide technical help with either or both of these two means: frequently asked questions

(FAQ) and general instructions. Knowledge base can be found in Lycos' help system. According to our study, the majority search engines prefer to use conventional instructional approach which seems more convenient for the users. Technical help by means of FAQ can be helpful but surprisingly only half of the search engines' HELP Systems have used this kind of approach. Nearly all of the search engines examined can be considered as they do not have Terminology Help, with two exceptions, and Strategic Help is being found only in a few search engines. These observations suggest that current search engines have much weakness in describing terminology information or introducing search strategies.

4.4 Post-search help systems

In terms of Post-Search HELP System, the focus was on how these search engines help the users to understand their search results and making relevance judgment on the retrieved information in order to better use the system. Some systems have a comprehensive coverage on their search outcomes. A number of search engines, mostly web portals, concentrate more on their associates rather than a wide-ranging web. Almost all the search engines provide the result preview, either in forms of text or images. Most search engines have their text preview, a short description about the page retrieved in their result page, which help users identify what might be related to their search. Search engines like Exalead even have the image preview included Table 2 shows the features of the Post-Search HELP Systems in the twenty search engines.

Most search engines use text as the basic component for much faster loading time, but some of them also use image as an extra search option. Even with the search buttons, only a few search engines used customized image buttons, while most of them used normal buttons. Most of the search engines provide links for related information by using "related links", "Similar Pages", "Also Try" and "Quick Link". In term of error correction, mostly it is provided in the form of "Did you mean" and "Spelling Suggestion". Only a few examined search engines do not have this kind of function; instead, they give unrelated information in which no key words are matched.

Table 2. Post-search help systems

Search Engine Name	Components		Related Links	Error Correction	Result Preview	File Type Description	Null Result Description	Color Differentiation
	Image	Text						
Google		✓	✓	✓	✓	✓	✓	✓
Yahoo		✓	✓	✓	✓	✓	✓	✓
MSN		✓		✓	✓		✓	✓
Live Search		✓		✓	✓		✓	✓
AltaVista		✓		✓	✓		✓	✓
Ask	✓	✓	✓	✓	✓		✓	✓
Lycos	✓	✓	✓	✓	✓		✓	✓
Big-search		✓	✓	✓	✓		✓	✓
Mamma		✓	✓	✓	✓		✓	✓
Exalead	✓	✓	✓	✓	✓		✓	✓
SearchKing		✓	✓	✓	✓			✓
Qango		✓	✓		✓			✓
Infoplease	✓	✓	✓	✓	✓			✓
Altheweb		✓		✓	✓	✓	✓	✓
iWon	✓	✓	✓	✓	✓	✓	✓	✓
WebCrawler		✓	✓	✓	✓		✓	✓
GigaBlast			✓	✓		✓		✓
Aelwi		✓			✓			✓
Links2Go		✓	✓	✓	✓			✓
PepeSearch		✓	✓	✓	✓	✓	✓	✓

POST-SEARCH HELP SYSTEMS

Except a few search engines, mainly null description is provided as in suggestion how this results can be typed out in terms of spelling, different keywords and suggestion on more general keywords. All of the search engines that were examined use color description to differentiate the header and different functions of the outcome results.

5. Conclusion

In this study we investigated help systems of twenty English search engines. Based on the framework used in evaluating help systems of traditional IR systems, our study looked into pre-search and post-search help systems.

It was observed that most search engines provide basic instructions of how to perform search with hierarchical structure, a few (four out of 20) also provide breadcrumbs to assist navigating help systems. However, the link to their 'help center' may or may not found in the homepages of search engines, with nine out of 20 search engines do not provide direct link on their basic search page, either through hypertext or hypermedia. Less than half of the investigated search engines provide FAQ. None offer terminology or strategic help. Related links, error correction, result preview, explanation to zero returns are general futures in search engines. Color coding of the search results is common practice, too. However, six search engines also present file types.

Brophy and Bawden reported that improving searching skills help users to get better search results when using traditional database, but the same learning effect was not observed with search engine users [10]. In order to promote self-regulated learning and to foster more

effective and efficient information searching process when using search engines, the design of help systems should benefit this type of study.

The information provided in this paper may guide future studies in the user stereotyping for design of help systems of search engines. Based on the features observed in the twenty search engines' help systems, one can investigate whether current search engine users are aware of them, and test the quality of the information and the usability of current help system structures. On the other hand, one can also study the usability of a search engine in relation to the design of its help system mechanism.

6. Reference

- [1] N. J. Belkin and P. G. Marchetti, "Determining the functionality features of an intelligent interface to an information retrieval system", *Proceedings of the 13th annual international ACM SIGIR conference on Research and development in information retrieval*, Brussels, Belgium, September 05-07, 1990, pp.151-177.
- [2] T. Grayling, "Fear and loathing of the help menu: A usability test of online help", *Technical Communication*, Vol. 45, No. 2, 1998, pp. 168-179.
- [3] A. Dillon and R. Gabbard, "Hypermedia as an educational technology: A review of the quantitative research literature on learner comprehension, control, and style", *Review of Educational Research*, Vol. 68, 1998, pp. 322-349.
- [4] G. Dworman and S. Rosenbaum, "Helping users to use help: improving interaction with help systems", *CHI '04 extended abstracts on Human factors in computing systems*, April 24-29, 2004, Vienna, Austria.
- [5] A. Spink and B.J. Jansen (2004). *Web Search: Public Searching of the Web*. New York, NY: Springer
- [6] A. Spink, and B.J. Jansen, "Searching multimedia federated content Web collections", *Online Information Review*, Vol. 30, No. 5, 2006, pp. 485-495.
- [7] Alevan et al., "Toward computer-based tutoring of help-seeking skills", In: Karabenick, S.A. (Ed.), *Help seeking in academic setting: Goals, groups, and contexts*. Mahwah, NJ. Lawrence Erlbaum Associates. 2006, pp. 259-296.
- [8] O. Kreymmer, "An evaluation of help mechanisms in natural language information retrieval systems", *Online Information Review*, Vol. 26, 2002, pp 30-39.
- [9] G. Brajnik, S. Mizzaro, and C. Tasso, "Evaluating User Interfaces to Information Retrieval Systems: A Case Study on User Support", *Proceeding of 19th International Conference on Research and Developments in Information Retrieval (SIGIR-96)*, Zurich, Switzerland, August 1996, pp. 128-136.
- [10] J. Brophy and D. Bawden, "Is Google enough? Comparison of an internet search engine with academic library resources", *Aslib Proceedings*. Vol. 57, No. 6, 2005, pp. 498-512.