

SEARCH ABILITIES IN ELECTRONIC JOURNALS: A COMPARATIVE STUDY OF SEARCH CAPABILITIES OF PERSIAN AND NON-PERSIAN E-JOURNALS

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Abstract- In this research the degree to which search abilities have been inserted into the search engines of Persian and non-Persian E-Journals has been investigated. 97 Persian E-Journals (PEJ) and 30 non-Persian, in this case English, E-Journals (EEJ) represent the research population. The required data were gathered through designing a checklist, which was filled out for each PEJ and EEJ. The results of the study showed that neither PEJs nor EEJs reached the standards of search abilities set for search engines. In all, EEJs' search engines by 37.9 percent insertion of search abilities in their search engines witness a better condition than PEJs' search engines.

Keywords - Persian Electronic Journals, English Electronic Journals, E-Journals, Search Abilities.

INTRODUCTION

The extensive use of new technologies in the production of information resources as well as the wide publication of them in electronic formats have resulted in publication of a large number of articles within E- Journals. Although EJs have not yet found their deserved status, even in developed countries, their everincreasing use has encouraged a large number of universities and research centers of the world to start the profession of EJ publication [10]. In 1994, there were only 13 EJs in the fields of Sciences, Technology and Medical Sciences. In 1995, the number rose to 115 [1]. McLennan [14] predicted that there would be 10000 EJs in the world in 1999.

Today, EJ publication on the web is increasing rapidly. The study on the *Directory of Open Access Journals* revealed that in a period of less than two months (from September 23, 2004 to November 21, 2004), the number of free and high ranked EJs, i.e. Journals having an international editorial board, rose from 1112 to 1362 and is still on the increase [3]. Although, there is no precise and accurate statistics concerning the number of EJs throughout the world, the total number could be estimated around 10000 titles.

The fact that new information tools and computer equipments are used for the production, provision and publication of EJs, has given them a privilege over their rivals. Some of such privileges are as follows: The ability to hold hyper text links to other related

resources; the possibility of adding colored pictures and tables as well as sounds and photos at low prices to articles; the ability to search the desirable articles; reduction of storage space; cutting down the possibility of information loss; information theft, damage of information, cutting down publication expenses [12] and also the possibility of issuing critical comments on articles simultaneously. The unavailability of prompt access to articles published in paper back journals [16], on the one hand, more confidence and cost sensitivity of them [5] and the accessibility of electronic articles role in publicizing [15], on the other, are other factors playing a role in publicizing EJs.

In EJs the ability and quality of user interfaces of which search ability is an important part is considered to be very important; because, it is the only vehicle by which the user can interact with EJs and get access to his/her needed information. As Hunter [7] mentioned, the easier the access to EJs the more the possibility of being used by users. Boolean search ability, proximity and use of wild card operators are among the most common abilities of EJ search engines.

While search engines and their abilities are important in EJs, evaluation of their search components in Persian, English and other languages will be very crucial. A comparison of Persian EJ search engines with non-Persian EJ search engines will help the programmers to design suitable search engines for PEJs.

PROBLEM STATEMENT

With the increase occurred in EJ production throughout the world, the use made of them as an important tool, for exchange and provision of scientific information and knowledge has also boosted. Today, EJs are considered to be an important media that can help researchers to access their information needs from all over the world. Although EJs can be used by scientists and researchers as an instrument for transmission of scientific information, their improper and inaccurate publication will be a waste of time and budget. Search tool is an important part of an EJ. By the use of a search tool, end users or researchers will be able to search through one or several issues of an EJ and access their information based on title of the article(s), author(s)' name, publication year and so on. Field search, Boolean search; Proximity and Wild Card are important abilities of a search engine. Ability of field search is one of the most useful abilities of search engines. By this feature, researchers will be able to search through EJ volumes and find their required information, which is related to a specific subject area. Failure of EJs to provide such abilities causes researchers not to find their proper information, which reduces EJ popularity and reputation.

Based on what already mentioned and because of the importance of observing standards in designing EJ search engines, the present research examines the degree to which Persian and non-Persian EJ search engines meet the required standards as it also aims at evaluating the abilities of these search engines.

OBJECTIVES OF THE STUDY

This research aims at studying PEJs and EEJs search engines to evaluate their search abilities. Also, a comparative study will be made between the abilities of PEJs and EEJs search engines.

RESEARCH QUESTIONS

1. Has a special standard been used for designing PEJ and EEJ search engines? How successful have they been in meeting the required standards?
2. How many search engines of PEJs and EEJs are using the Boolean operators?
3. How many search engines of PEJs and EEJs are using abilities of Field search, Subject search, "year" and search in previous volumes? Which groups of PEJs or EEJs use these abilities more?
4. In what percentage of PEJs and EEJs are the abilities of proximity and wild card operator preserved?
5. In how many percent of PEJs and EEJs does the ability of reviewing (Going to the previous, next and arbitrary pages) exist? In which group, PEJ or EEJ, has this ability been observed better?
6. How many PEJs and EEJs enjoy the output (printing, displaying and storing)?
7. Do search engines for PEJs and EEJs have the ability to carry out multilingual search?
8. What is the general status of search abilities in PEJs and EEJs?

RESEARCH DESIGN AND METHODOLOGY

-PROCEDURE

Because the emphasis of the study is on collecting, classifying and comparing the information related to the abilities of PEJ and EEJ search engines, survey research (descriptive method) is used to carry out the study.

-RESEARCH POPULATION

97 PEJs and 30 EEJs represent the research population (The researcher used all published PEJs on the Web).

Because there was no complete or even partial list of PEJs, the researcher found some addresses through some web sites or by searching some Persian Search engines such as Google, Iranhoo, and Parseek on the Web. After reviewing all the Web addresses, some links to newsletters, bulletins, and propagation sites and eliminating them from the list, the researcher got to a list of 97 PEJs, which constituted PEJs sample of the study. Because of the huge amount of EEJs, lack of a comprehensive and unique list of these journals and

also subscription fees for many of them, the researcher considered Directory of Open Access journal (www.doaj.org) as a basis for getting access to EEJs [3]. Due to time limitation, the researcher selected only 30 EEJs by which he could extend the results to other situations.

-DATA COLLECTION PROCEDURES AND DATA ANALYSIS

The data were collected using a check list. Search abilities were studied through a comprehensive survey of each PEJ and EEJ. The results were then written in the check list. The raw data were classified based on research objectives. The SPSS version 12 was used to analyze the data.

REVIEW OF LITERATURE

By inspecting some databases (ISA, LISA, Dissertation Abstracts, Web of Science, ISTA and ERIC) and the Internet, some research endeavors were found on evaluation of search abilities in search engines. These studies are as follows:

Kraft and Bookstein [11] studied Swets model in information retrieval as well as measurement of search efficiency. They used two criteria, namely recall and precision for evaluation of search abilities. Also, they referred to search abilities of some databases and EJs.

Robertson [18] did a research on the evaluation of information retrieval systems and pointed to the complexities of this evaluation. He mentioned that some factors such as relevancy, behavior of end users and their interaction are very important. In this regard, Robertson described the abilities of retrieval systems.

Burgin [2] in his study suggested a substitution for Mont-Carlo Method, in order to evaluate the performance of search engines. Burgin Method can be used for the evaluation of retrieval system performance and determination of possible results. In addition, this method will determine the performance of retrieval systems under particular circumstances and at the time when users deliver their requests.

Kcane [9] in his research, "Electronic Journal Services", pointed out to the EBSCO on line program. Subscribers of this service can get access to titles of different EJs and study the articles. Also, he described the features of this program and felt necessary to redesign its interface to improve search ability performance and access to more journals.

Another study in 2003, published in Journal of Documentation, showed different search methods in different fields of study [17]. The aim of this study was to explain the reasons for use and nonuse of EJs and databases. The results showed that those EJs that had better search abilities were more useful than the others. Mc-Kiernan [13], in his study, "New age navigation, innovative information interfaces for e-journals", revealed that in EJs, like databases, search abilities are used and even in certain EJs more access options

are provided. He also discussed the development of e journal search devices.

Harrison and Macleod [6], in their study of Virtual Library (JISC), discussed the abilities of this library to retrieve EJs. The searching devices of this library can retrieve the information related to EJs in 820 sites. At the present time, the search engine of this library retrieves only the articles and cannot search other resources.

Grudge and Johnson [4] did a research on a model for the evaluation of searching devices. Regarding the increase of interactive search engines, they attempted to construct a model for evaluation of search engines. The results of this study formed some criteria for search engine evaluation.

Hyldegaard and Seiden [8] explored the usefulness of personalized access to scholarly articles in EJs. It was the objective of this research to determine the factors affecting the personalization of search abilities through conducting a search. The study showed that in interface devices, the deliberate arrangement of abilities in search engines is highly given priority (this study was conducted by 14 post graduate students).

RESULTS AND DISCUSSIONS

-USING STANDARDS IN DESIGNING EJ SEARCH ENGINES

In order to design search engines of databases, EJs, digital libraries, and Web, they must be conformed to a set of specific standards. ISO (International Standard Organization) and NISO (American National Organization of Standard) set the following standards for designing search engines: (ISO 8777 and ISO 10162/10163); (NISO Z 39.5). Reaching the required standards is an important factor for designing search engines. Based on a comprehensive survey, it is founded that none of the EJs could reach these standards. So, PEJs and EEJs are the same in this regard.

- BOOLEAN SEARCHING

To limit the search scope, usually three operators (and, or, not) are used. The operator "or" develops search scope, but the other two operators (and – presence of a word / not - omission of a word) limit the search scope.

Table 1 shows the status of embedding Boolean operators in designing PEJ and EEJ search engines (The figures are expressed in percentage).

Table 1: Percentage of embedding Boolean operators in Persian and English electronic journals.

operators	And	Or	Not
PEJs	10.3	1	0
EEJs	53.3	43.3	30

In designing search engines for PEJs, the operator “and” was embedded more than the other operators (And = 10.3%). Operator “or” was used only in one PEJ and operator “not” was not used in any of the PEJs.

In the case of EEJ search engines, the status of embedding Boolean operators is as follows: *and*: 53%, *or*: 47% and *not*: 30%. Generally, it could be concluded that Boolean operators were used more in designing EEJ’s search engines (EEJs: 42.3%, PEJs: 3.7%)

-ABILITIES OF “FIELD SEARCH”, “SUBJECT SEARCH”, “YEAR LIMITER” AND “SEARCH IN PREVIOUS VOLUMES”

In designing search engines for EJs, factors such as field search, subject search, year limiter and search in previous volumes are important abilities which must receive much more attention on the part of researchers. Table 2 shows the frequency and the percentage of embedding these abilities in PEJs and EEJs.

Table 2: Percentage of embedding field search, subject search, searching in previous volumes and year limiter in PEJs and EEJs.

Search abilities	PEJs	EEJs
Previous volumes	7.2	43.3
Subject search	4.1	53.3
Field search	4.1	43.3
Year limitation	3.1	33.3
Average	4.62	43.3

In designing PEJs search engines, the ability of search in previous volumes was used more than the other abilities, and year limiter was used less than the others. In designing EEJs search engines, subject searching existed more than the other abilities, and “Year limiter” existed less than the others. In general, 4.62 percent of PEJs search engines, and 43.3% of EEJs search engines had the embedding field search, subject search, “year limiter”, and finally search in previous volumes. These abilities were presented much more in EEJ search engines than in PEJ search engines.

- PROXIMITY AND WILD CARD

If a user wants to retrieve two or more adjacent words, s/he should use the ability of Proximity. Also, if s/he wants to develop the usage of a word and retrieve all its derivations, s/he should use the ability of wild card. Table 3 shows the status of search engines for PEJs and EEJs.

Table 3: Embedding proximity and wild card abilities in search engines for PEJs and EEJs in percentage.

Operators	Proximity	Wild card	Total
PEJs	1	1	1
EEJs	20	40	30

Only one percent of PEJ search engines embodied these two abilities. In this regard, EEJ search engines had the following position:

Proximity: 20% of English EJ search engines.

Wild Card: 40% of English EJ search engines.

In all, 30 percent of EEJs and one percent of PEJs embodied these abilities.

- REVIEWING ABILITIES

The search engines of EJs are able to represent the resources or articles related to user requests. Representing hints systematically through pages, going through previous or next pages and navigating the user to the deliberate pages quickly are necessary abilities in the search engine structure of EJs. Most EJ search engines use the browser for navigating to the next or previous pages, which is not a suitable method. In general, 11% of PEJs and 4% of EEJs enjoyed the reviewing ability in their search engines (Table 4). So, in the case of Review, PEJs were in a better condition than EEJs.

Table 4: Percentage of reviewing abilities in PEJs and EEJs.

Abilities	Persian	non-Persian
Go to the previous page	16.5	3.3
Go to the Next page	16.5	3.3
Go to Any page	0	6.7
Average	11	4.4

- OUTPUT

The output includes the ability to print, store and display full-text articles. If there are no independent prints or storage facilities in EJs and if the ability of browser just exists, it can be claimed that these journals are without any independent output ability. 95.5 % of PEJs and 96.7 % of EEJs had the displaying ability for full-text articles. Only one percent of PEJs contained the storage ability. In the case of EEJs, 60% of them set out this ability. The information related to output abilities is presented in Table 5. Generally, 34.36% of PEJs and 70% of EEJs had the output ability.

Table 5: Percentage of output abilities in PEJs and EEJs.

Output ability	Persian	Latin
Print	6.2	53.3
display	95.9	96.7
storage	1	60
Total	34.36	70

- MULTILINGUAL SEARCHING

With regard to the spread of different languages in the world and the existence of different native languages in different countries, the ability of multilingual searching is highly valued by many researchers. It was found that only 2% of PEJs and 23% of EEJs enjoyed this kind of ability. It is mentionable that this is a weak point of search engines.

CONCLUSIONS

Table 6 represents an overall overview of PEJ and EEJ search engines. As it is illustrated, in designing search engines for PEJs, *display ability* was used more than the other abilities. The ability of *going to the previous pages* ranked the second (16.5%). In designing search engines for EEJs, *displaying ability* ranked first too. *Storage ability* ranked the second, and maintaining *and operator*, *Print* and finally *subject searching abilities* ranked the third. In general, only 10.54 % of PEJs maintained the search abilities. The position for EEJs was 37.9. Consequently, on the subject of using search abilities in designing search engines, EEJs ranked first (37%).

Table 6: General status of search abilities in PEJs and EEJs.

General status of search engines	PEJs	EEJs
Search in previous volumes	7.2	43.3
Subject search	4.1	53.3
Field search	3.1	43.3
Year	3.1	33.3
Previous page	16.5	3.3
Next page	16.5	3.3
Any page	0	6.7
Print	6.2	53.3
Monitor	95.9	96.7
Storage	1	60
And	10.3	53.3
Or	1	43.3
Not	0	30
Multilingual searching	2.1	23.3
Wild card	1	40
Proximity	1	20
Average	10.54	37.9

NOTE:

1. In this paper the term 'non-Persian' has been used to mean 'English'.

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