

INFORMATION RETRIEVAL BETWEEN REALITY AND EXPECTATIONS IN THE ERA OF BIG DATA

¹Ibrahiem M. M. El Emary,
²Maysa Ibrahim Yousef & ³Rebeca Soler

Information Science Department, King Abdul-Aziz University
Jeddah, Saudi Arabia

Role of Big Data Analytics in Information Retrieval

By combining different retrieval techniques and effectively using big data, information retrieval systems ranging from small and multi-provider groups to large networks and organizations stand to realize significant benefits.

Potential benefits include:

- 1- Increasing the efficiency at earlier stages when they can be retrieved more easily and effectively.
- 2- Managing specific data bases and detecting results more quickly and efficiently related to the user query.
- 3- Numerous questions can be addressed with big data analytics.
- 4- Certain developments or outcomes may be predicted and/or estimated based on vast amounts of historical data, such as: length of stay (LOS); users who will choose the results; users who likely will not benefit from results retrieved; complications, etc.

The need and Importance of Information

When looking at the needs of beneficiaries for information on the basis of professional motives, they can be summarized as follows ⁽⁴⁾:

- The need for information to help solve a specific problem or to facilitate decision-making
- The need for basic information about a particular subject
- The need for information about new developments in a particular field

Impact of Various Information Retrieval Strategies on the Research Process

the researcher must be aware of the differences between the various sources of information, as they are ⁽⁴⁾:

- Ever-changing
- There is no a system showing the beneficiary whether the source of information is a qualified person or not.
- Connecting to the Internet differs from the direct interview.
- Difficulty of distinguishing between the facts, opinions and advertising materials.
- Easy to get an answer that may seem correct but it's actually wrong ⁽⁷⁾.

The outcome of any research is based on the intersection of three factors ⁽¹⁾ :

- Research strategy
- Research tool
- Page content

Relationship between Beneficiary Requests and Efficiency of the Retrieved Information

the effectiveness and efficiency of any information retrieval system are measured, depending on the judgment of the beneficiaries, due to the following reasons [3, 5]:-

- The judgment of beneficiaries is useful for recognizing the accuracy levels through detecting the status of compatibility between retrieved documents and research requirements.
- What is suitable for a beneficiary may not be so for another person later.
- The concept of accuracy from the standpoint of the beneficiary is often relative and may be influenced by the external factors impacting his decisions.
- The judgment of beneficiaries affects the accuracy of the research process

the Beneficiary carries out the research alone

Here are some factors that may affect the research effectiveness and have a close relation to the stage of drafting the research request, assuming that the beneficiary carries out the research alone.

- The degree of complexity of the request
- Flexibility of the indexing language
- Source of coverage for the database
- The practical experience and language capabilities of the beneficiary
- Supporting the information retrieval system

The Major Strategies of Information Retrieval

the most important information retrieval strategies include:

- The strategy of A shot in the dark
- The strategy of Bingo
- The strategy of Bite
- The strategy of Pearl growing

The Research Problem Statement

Although the information has a key role in all aspects of society, accessing it previously depended on the traditional methods which were not used optimally. With the advent of the digital information environment which contributes to the activation of scientific research and the production of valid information, the ways of getting this information as well as its means and tools were developed. This question was raised: is such a means used properly? Thus, this study was conducted to determine the effectiveness of using the information retrieval mechanisms optimally.

The Research methodology

The SWOT analysis was used to determine the strengths and weaknesses, opportunities and threats through analyzing the strategies used in the different tools to retrieve the information through these four items: strengths and weaknesses, opportunities and threats. Whenever the analysis is precise, it will be easy to select the proper research tool and get the accurate research results for the long-term. However, if the analysis is weak, the possibility of getting weak information will increase (8).

The SWOT analysis



The basic step to know the best information retrieval tool depends on the researcher's understanding of the proper research tool and the strategy on which the selected tool is based as well the strengths and weaknesses, opportunities and threats.

The internal environment analysis

□ The strengths:

- Providing a deep understanding of the information retrieval strategies to help the beneficiary to express particular topic.
- Limiting the beneficiary's hesitation in using the appropriate terminology to express the content of intellectual production in an area.
- Serving as an appropriate tool to make the research process easier and save the efforts of the beneficiary and the mediator.
- Limiting the variation or difference in views on the use of the appropriate terminology.

The internal environment analysis

- **The weaknesses:** The researcher's lack of knowledge about the strategy suiting his research could lead to:
 - Relative discrepancy between the quantity, quality and suitability of the retrieved information as a result of the direct response to the information retrieval system between a beneficiary and another.
 - Difficulty of recognizing the relevance of the actual results obtained by the beneficiary to his research and objective needs as a result of using different tools in retrieving information without adopting the appropriate strategy.
 - Weak retrieval efficiency wasting the time and efforts invested by the beneficiary in conducting a survey and examining a large amount of information as well as continued research, which will weigh negatively on the beneficiary.
 - Big effort exerted by the beneficiary in the research process which affects the final performance.

The external environment analysis

The opportunities:

The best way to solve the information retrieval problems is to develop applications for the expert systems. These artificial intelligence applications can guide, analyze, communicate, design, explain, examine, define, test and save, and they are considered an alternative software to solve the problems that the experts want to resolve in the information retrieval processes. The software also ensures the standardization of the different procedures, in addition to simplifying and reducing the efforts as well as taking advantage of the expert systems that have been used previously in 1967. Then, the first expert system was used in the field of reference service and response to inquiries. In 1972, another expert system was applied to retrieve information from the sources that were available in the libraries. In 1977 and 1983, other expert systems were applied. Despite the failure of some systems and the success of others, the general index still shows the development of the application of the expert systems.

The external environment analysis

The threats:

- ❑ Difficulty of identifying strategies for retrieving information which save time and effort.
- ❑ Difficulty of differentiating between the shot in the dark strategy and the research by using words.
- ❑ Difficulty of finding the appropriate links between the research words that are used in retrieving information.
- ❑ Difficulty of choosing the right strategy at the right time.
- ❑ Lack of expert systems that help researchers to retrieve information
- ❑ Lack of overall satisfaction among the researchers due to their inability to control the research processes, which accordingly affects the quality of the retrieved results.

Conclusion and recommendations

we can conclude the following:

- The important role played by information retrieval through the usage of the appropriate mechanisms
- The appropriate mechanisms of information retrieval ensure the easiness to conduct the different scientific researches and reach the required information with less time and effort.
- There are no contributions to set accredited criteria for the retrieval of information through appropriate mechanisms.
- The development of scientific institutions allows beneficiaries to know the mechanisms and strategies of retrieving information.

Accordingly, we recommend the following

- Establishing a national authority at the level of universities, institutes and institutions which seek to retrieve information as per the appropriate rules and mechanisms
- Shedding the light on the mechanisms of retrieving information in order to provide the scientific content for all information centers and individuals
- Providing the researches that aim to retrieve information and show how to use and benefit from it
- Helping to educate the researchers and enrich their knowledge about the information retrieval mechanisms, which will increase the possibility of reaching several sources of information that beneficiaries failed to reach previously
- Helping beneficiaries and boosting their abilities to select the research terms through knowing the appropriate strategies

Accordingly, we recommend the following

- Paying attention to the different research strategies to identify a certain source and determine the unknown sources
- Boosting the beneficiaries' ability to learn from experience and add new sources to the knowledge base
- Helping to create and map out the appropriate research strategy
- Automatic amendment of the research strategy used in the different tools in the light of the reached results.
- Boosting the ability to detect mistakes in the research results.
- Considering all possibilities of writing the right term linguistically and grammatically.
- Shedding the light on the ability of expert system of retrieving information to select terms based on the specialization of the researcher and his objective trend.