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Semantic Linkages with Keyword Based Searching In Relational Databases for Improved Results

Chandresh Kumar Chhatlani
Assistant Professor
Department of Computer Science & I.T
JRNRVU, Rajasthan

Dharmesh Bhatt
Research Scholar
Department of Computer Science & I.T
JRNRVU, Rajasthan

ABSTRACT-
This paper discusses about Keyword based search for Relational Database. This method is one of the traditional methods, but using in most of the applications regardless of web or desktop. Tools of Relational Databases can store huge amount of information, however, at the time of real-time execution of search related query, it may become hard to search every keyword in every field of all records. Scalability, performance, match-making and analyzing rank of the search results is not effortless to be implemented. Semantic Web is one of the concepts, which can improve rank of the results. But this is technology is even not being used many web-developers. One of the reasons may be pre-developed application tools, classes, etc. The basic idea, which this paper describes, is based on the database schema, where similar knowledge can be stored efficiently in the database, which could also become a key-attribute for index. In this case user will search only keywords, what he or she has in mind and the query execution can produce precise results accordingly with proper ranking. At last relevant results will be returned for a given keyword query by creating index and better ranking methodology.

Keywords: Relational database, RDBMS, Keyword based search, Ranking methodology, Semantic Web

I INTRODUCTION

For retrieval information from web pages, keyword based searching is widely using by web crawlers, however due to increasing number of users, demand of information retrieval is also increasing and arising difficulties for developers to obtain, organize, access, and provide updated information to their users. Keyword based searching provides simple but successful and speedy approach for data related query. According to the architecture of the database the Knowledge base can be implemented for the users with different limitations and different efficiency, the user submits a set of keywords and the system dynamically execute query (ies) and produce resulting rows accordingly on a predetermined definite rank. End-users cannot write SQL queries, they can provide only keywords, as they are not competent in database query language and they do not aware with database schema. Keyword search approach is simple but not adequate methods of searching for the Web applications. Different contemporary technologies of keyword search can be applied to search structured and random data in relational databases by performing keyword search on the various attributes of entities in databases. The matched results from multiple rows and columns outline a result set of that match the keywords. The ranking, results are directly proportionate to the keywords written by the user. The ranking method is based on one or more attributes in ascending or descending order, which may not produce adequate results, the user may need to search every row to get a particular one. In this paper, we propose a ranking method that is applied to a set of joined attributes and tables that contain certain keywords. Result set is much more attractive than traditional one. This approach

can provide the possibility of immediately termination of the keyword search when user searches the exact number of results and can reduce the query execution time.

II Requirement of New Ranking Method

Think of Google search, enter few keywords, and try to search, what is in your brain. You may get 30%-50% results which are relevant, in first page. Obviously, all the results having keywords, whatever searched, but all are not relevant, what was in your mind while searching. There may be more than one attribute that can be a part of the result, while these outputs are not similar useful to the user input keyword search. This is the case rank the more relevant results are required. Less relevant results should be with less ranking. In this paper, we introduced a new method for information retrieval over a relational database and calculate the both efficiency and effectiveness of the method in the experiments upon a real dataset. Here users may query with attribute name or their favorite terms.

III Review of Related researches

Information retrieval concerns structure, analysis, organized search, storage, and retrieval of data. An information retrieval system automates this task. Evaluation in the system is required to ensure relevance; several studies have been conducted to improve this relevance.

Keyword search on relational database can be categorized into two methods, first one is based upon Steiner trees and the second is based upon Candidate Networks. In Steiner tree attributes are classified into relationships as primary and foreign key. The Candidate Network is based upon answers by extending and generating the Candidate Network, using primary-foreign key relationships. It supports only matching all keywords and returns all rows with results. This reduces redundant information by joining every network of rows on primary key and foreign keys. DISCOVER and BANK methods are also studied which proposes algorithm for query ranking and execution.

IV Proposed Database and Keyword Query Model

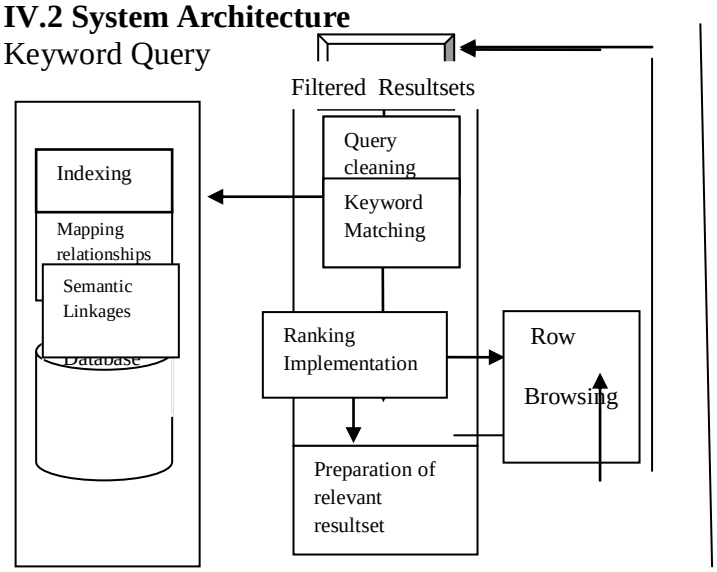
IV.1 Database model

Database model is based on several sub models. It is a collection of rules and concepts for the description of the database. One may say that it works like a protocol. Mostly the users use relational model, which defines a database as a collection of tables (entities) which contain all data. Suppose a database has n number of relations, we may denote them from R_1 to R_n. Here we assume, relation R_i has m_i attributes ai_1,……., ai_{mi}, a possibly primary and foreign keys into other relations.

Keyword queries

Generally, a query consists of m>=1 search terms, S={k_1 to k_n.) and a database with a searchable interface I (B_1 to B_k), which relies on relation R (B_1 to B_k).

IV.2 System Architecture



IV.2 Proposed Architecture

The proposed architecture has six phases:

A. Prepare Semantic Linkages

The Database schema has profile of every user, which will have nature of users' searching. Mostly used keywords, common spelling errors, common languages with keywords, etc. will be there as a part of database or outside the database, which may create link with database.

B. Indexing the keyword in the sequence of keywords written

Indexing means sorting of rows. To design knowledge base, its index table may be prepared as follows:

1. Check whether Relational Database is following rules of normalization and no redundancy is there.
2. Create index for every text based attribute. Knowledge base will be used to store the information of particular attribute will be designed as index (sorted data) with into database schema. Attributes with similar nature or text will not be indexed. The Database value in the index table will be used to store the related information and identifier of the attributes. Database value is used to store the cell level information that can reduce the number of accesses to the index table.

C. Searching the keyword query

At first the system produces a cleaned query. Spelling corrections of the query is corrected, keywords are filtered according to the users' profile and semantic linkages implement to get relevant keywords. The cleaned query may not have all the keywords user searched. The cleaned query unions with traditional query, so that any result could not be remained.

The keyword query consists of a list of keywords, entered exactly by the user; an interpretation of query is keyword matching information.

D. Ranking the result

Results of the cleaned are preferred and their ranks will be preferred. The results of keyword query will be less preferred. However the results which are produced by both queries will be treated as a part of cleaned query. This ranking strategy is much useful for obtaining the relevant answer. For finding relevant answer we use simple but effective rank function:

$$\text{Rank}\ (A_i, S) = \sum RK\ /$$

Where RK = total number of relevant keywords in the database with respect to user input query.

U_{iq} = total number of the keywords of user input query.

The criteria by which relevant result is determined: identifying the number of times the keyword search word appears in the database, keyword search terms all or only some are matched, and the number of times the keyword search terms appear relative to the length of the keyword.

E. Filtering relevant rows

To filter relevant rows, first sort the rows according to the clean and usual query's redundant records, after that sort according to the assigned rank. Now filter upper limit values to search the relevant data.

F. Preparation of relevant result-set

One needs to prepare the relevant result-set after filtering the database. This relevance will be obtained by integrating keywords with grammar, which is already entered either in database or outside the database.

G. Row Browsing

The browsing of records will also be a tedious task. However, the system will browse the related knowledge with the answered attribute set in order to find the relationship between of input keywords. A

schema graph may also be there to consider all the attributes, and the relationship between these tables also considering semantic knowledge.

V CONCLUSION

In this paper, we presented a keyword query search from a search engine using ranking method. We proposed a method keyword search over a relation database with semantic knowledge integration. The performance of keyword search uses ranking methodology. The major perception of this technique is based on a semantic based knowledge base that stores the related contents of attributes. By which we can design an index to store the information in a specific way which creates the effective ranking methodology of different attributes. Keyword based search access the information regardless of semantic. Uniting of these two methods can show proper results.

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