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Processing of fuzzy queries and software implementation to a relational database of wholesale and retail commercial enterprises

Kenan Kilic[a]* Tarlan Abdullayev[b] Ramiz Alakbarov[c] Nuray Kilic[d]

[a] *Department of Computer Engineering, Qafqaz University, Baku, AZ0101, Azerbaijan*
[b] *Department of ScientificbAffairs, Odlar Yurdu University, Baku, AZ1072, Azerbaijan*
[c] *Information Technology and Programming, Azerimed Ltd, AZ1147,Azerbaijan*
[d] *Department of Business Administration, Qafqaz University, Baku, AZ0101, Azerbaijan*

Abstract

In the article the detection of "missing" or "hidden" data during the processing of the well-defined queries to database is discussed and on terms of quality the importance is justified, the article also covers organization, processing, and program implementation issues of fuzzy queries to database of information systems.

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1. Introduction

Continuously increasing development of the market economy requires creation of effective, coordinated work regime for wholesale and retail companies and enterprises which form the core of the commercial economy. Thus, the increase in business processes and functions in such kind of enterprises demands maintenance of various large-scale and complex structured data in the database.

At the present time the use of the information, obtaining new results from it and determination of the necessary data are very important issues. In recent years, when the competition among enterprises is analyzed it is obviously seen that the enterprises which benefit information in an appropriate way have gained more profit. In addition, the

* Corresponding author. Tel.: +994-(12) - 349 99 66; fax: +994-(12) -349 99 90.
E-mail address: kkilic@qu.edu.az

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use of information systems that is considered new technologies have provided quality products and service. In order to continue operating an enterprise for a long time to get required data from information is an essential factor for organizational planning and control[1].

One of the most important sources to ensure the continuity of enterprise earnings is to use information in an appropriate form and to find out necessary information. İt is the person who gets desired results from information and use it effectively. Therefore, to provide the success of the company the most essential factor is that employees should not only know their work well, but also they should motivate on their work properly. Additionally, in the arrangement stage of enterprise information systems employees often confront with stress and intensity. This condition causes a decline in employees' motivation[2]. Productivity of an enterprise is an important factor for being a successful enterprise. And it is the motivation that provides this condition[3]. In order to compete in this market with other enterprises it is of great importance to fulfil necessary actions that will not allow employees to lose their motivation.

So that the increase of business processes and functions in such enterprises demands various large-scale and complex structured data storage in the database. On the other hand, the increase of data on a regular basis makes its usage necessary not only to keep data but also to solve different types of analysis issues: in terms of practice it makes necessary to learn various types, hidden connections and other regularities that exist among the given data and as a result very actual problem occurs – for the preparation of analytical and daily reports to use the collected database effectively and qualitatively storage, selection and analysis issue of corporate data appears.

Although modern instrumental tools of Data mining and business intelligence systems enable the solution of storage, selection and analysis issue of corporate data, in most cases the use of these tools in various subject areas on terms of carrying out decision-making over non-digital data is not possible and this puts forward special requirements to the description and processing of data. And also fuzzy survey of modern processing algorithms to database approaches the solution of these issues in a fragmented way and do not cover the full resolution of the matter[4].

From this point of view to enable creation and control of database in information systems of investigated companies, to allow the personnel to prepare daily and analytical reports and in order to increase the quality of decision-making process the data analysis in database and carrying out query processing algorithms are very actual issues.

2. The mathematical model and program implementation of processing of the fuzzy queries

Relational database is conceptually information model of subject area. Thus, each copy of database reflects the condition of subject area for some time. Every condition is modelled as specially arranged data – values (attributes) pairs that express the features of objects of the subject area. Each procession is compatible with the object and relationship to its state. It should be noted that the procession of these relations must also express fuzzy relations that are specific to attributes.

For example, the number of assortment is - much, sale is - low, the sale of manager is – good, salary – high, the distance from metro to chemist's is - far, the customers of the chemist's are - many and so on.

To express relations among the objects of subject area (SA) – fuzzy[5] class concept has been applied to the solution of the discussing issue.

Fuzzy class is described in the following manner:

$$HK = \{(oij, aij , \mu(oij)) \mid oij - object, aij - attribute \text{ and } 0 < , \mu(oij, aij) \leq 1\} \quad (1)$$

, here μ(oij) expresses – the membership degree of aij attribute to oij object in HKi fuzzy class. (oi j, ai j, μ(oij)) pair is called fuzzy object.

Taking into acccount the features of subject area[6], as an object - employees, pharmacies, customers, managers, cash registers, banks etc. are understood.

As seen from the example, as an attribute salary, sale, purchasing, income, currency, assortment etc. are meant.

For the subject area of fuzzy classes :

1. monthly sale of chemist's, very high, 0.96