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Fuzzy Database Techniques During Corona Epidemic

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ABSTRACT

The databases are widely used in public information systems, which, in turn, use software tools for safe and secure data processing called Database Management System (DBMS), which ensure the connection between the user level or the programmer and the level of representation of physical or physical data to store and retrieve data.

Database applications have become widely used because of the tremendous development of database technologies, most database applications are based on relational database model and are advantageous to the query language, the Structured Query Language (SQL) is a logic-based binary so they do not represent the real reality and overlook an important aspect of truth.

This paper presents Logic Fuzzy Techniques in SQL Query System Design Using Delphi programming language and Oracle8 database management system in relational databases supports Fuzzy logic, so this paper will explain common language systems that have the ability to deal with big data -especially the fuzzy database that are currently being used to combat the Corona epidemic**.**

KeywordsInheritance, Semantics, Object, Fuzzy, Database, hierarchy, epidemic.

Introduction

Databases are a new term that appeared with the advent of technology, the Internet and the programs. The database is the foundation and the main structure on which the program is based. When programmers make a specific program, there is stored data to be handled. This data is stored and defined as a database. Each one has mathematical relations, consists of tables, and inside the table are fields where the data is stored, and each field has a type and is known as a data type. The main purpose of the database is the ability to deal with it and not to repeat data and the possibility of working on them in terms of addition and deletion, data retrieval and modernization, these operations by the programmer to make special codes of programming to deal with the database [11].

hierarchical database management systems are designed for heterogeneous data that can be easily built into previously defined data fields, organized into rows or tables, but many of the classifications required today and, in the future, require databases that can store and retrieve not only the structure and characteristics but require Databases dealing directly with multimedia, and data formats of a new type such as voice, image, complex entities [3].

It is also used in web applications and is useful in storing data types, which is known as the fourth generation of databases.

The emergence of relational and vector hybrid systems that are available to combine the capabilities of target-oriented databases and relational databases.

Despite the ordeal that the world is currently going through due to the epidemic, some

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countries of the world, such as China and the United Arab Emirates, have taken the opportunity to employ many applications of big data, artificial intelligence and machine learning on the ground to track the spread of the epidemic, early diagnosis of the infected and accelerate the process of discovery treatment, sterilization of public places and management The crisis effectively justifies the return on investment that these countries have made in research and development in the field of data science and artificial intelligence over the past few years.

The syntax of the SQL language may vary slightly depending on the DBMS used. Here is a brief description of some common systems:

A. SQLite

It is the most common open-source database, commonly used in web applications. The basic advantage is that it is easy to use, cheap and reliable, and there is a large community of developers who can help and answer questions. But it suffers from poor performance and lacks some of the advanced features that developers prefer to use.

B. PostgreSQ

It is also an open source but free database that is not owned by any company, commonly used in web applications.

It has many advantages with MySQL, and it offers some good features like external key support without complex build-in. But it is slow to perform, and less common than MySQL, making it difficult for hosts and service providers.

C. Oracle DB

This database belongs to Oracle, and it is driven. Used in large applications, especially in banks. Most of the world's largest banks operate Oracle applications, because they offer a powerful combination of technology and comprehensive business applications, including core functionality designed specifically for banks. Its main drawback is that it is not free.

D. SQL Server

This database is owned by Microsoft and, like Oracle, is also driven. Often used in large enterprise applications, the main difference from Oracle is that they support Windows only. Microsoft offers a free version of the novice level called Express but can become very expensive when you expand the application.

Thus, data in the relational database is stored within relational tables (representing entity relationships), which can grow to contain multiple descriptors and records. RDBMSs use SQL Structured Query Language to manage data in these large tables, and you can choose RDBMS to make you comfortable and fit the complexity of the application you are working on [9].

1. Architecture of the Distributed Fuzzy Database Management

Distributed fuzzy database management systems of the distributed fuzzy databases (DFDB) operate goal-oriented inquires between set a physically remote DB. DEDBMS includes global base of knowledge for organization of metaknowledge, which describe area of application. It also

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contains the knowledge clusters dictionary, which is modified as a semantic network of the terms on a subject domain. The architecture of DFDBMS is given in figure (1).

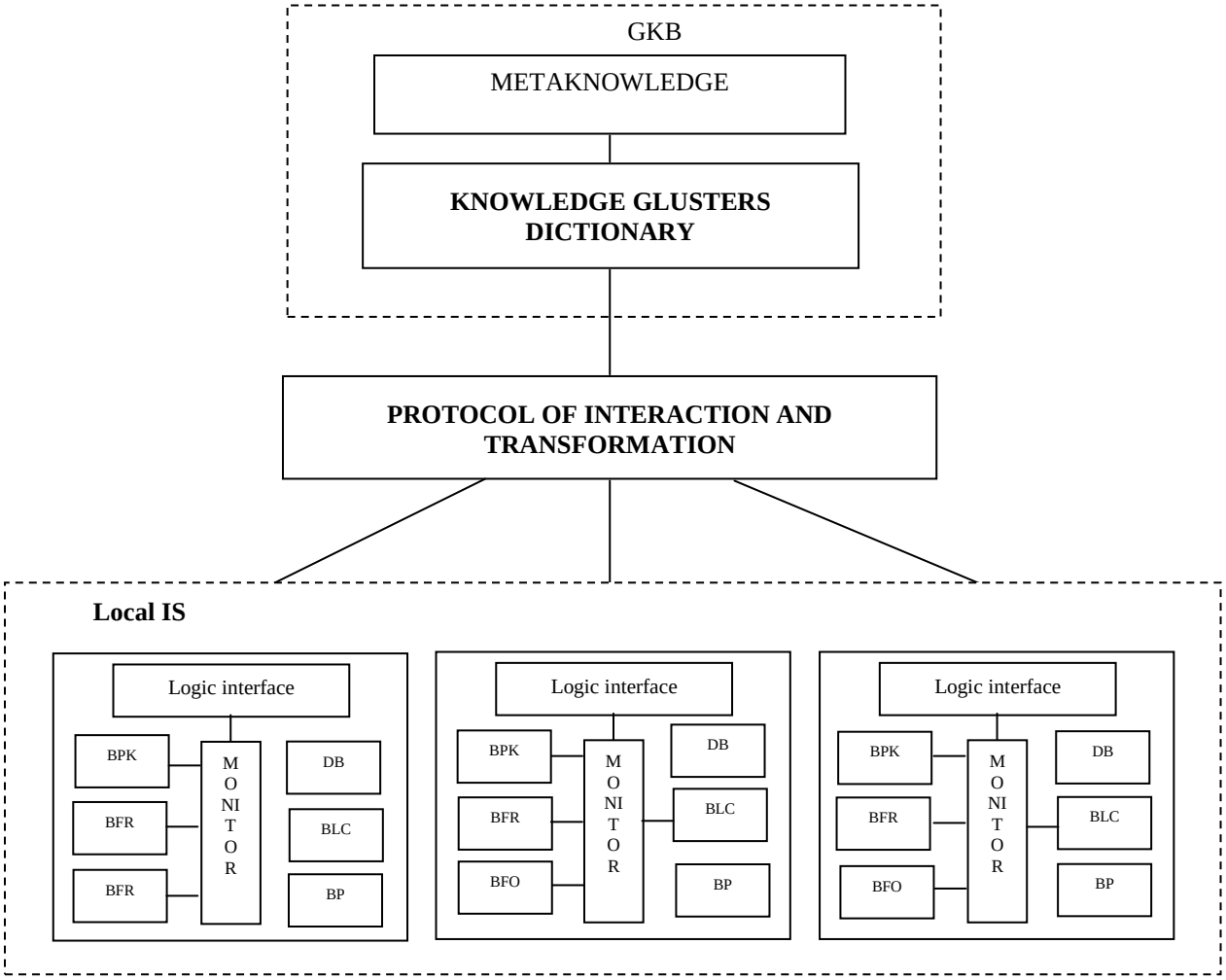

Figure (1) the Architecture of DFDBMS

2. General Description of Interaction Between GKB and Local DFDBMS

The inquires of the user can operate DFDBMS, or separate local DFDBMS. When the user state a problem to DFDBMS, the global knowledge base will use the knowledge cluster dictionary for definition which knowledge base contains knowledge required for performance of the goal, put in in1quiry. For processing one inquiry of GKB it a little local DFDBMS can be required. For a choice of most suitable local DFDBMS the Global Base of Knowledge uses metaknowledge of a subject domain and logic interrelations among local DFDBMS [10].

The groups sub goals of GKB in logically connected clusters. From initial user inquiries and metaknowledge GKB it turns out sub goal of GKB, which are the most detailed tasks.

The knowledge cluster dictionary consists of two parts: distribution sub goals of GKB to separate cluster of knowledge and assignment of every cluster of knowledge by one or more local

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GKB [7].

Local DFDBMS cooperate with DFDBMS through the standard protocol of messages. At performance of inquiry the local use DFDBMS as connection with other DFDBMS.

A verity of representation of knowledge is supported in local DFDBMS with the help of the general protocol of interaction and function of transformation between GKB representation and representation by every local DFDBMS. The protocol of interaction is algorithm of transformation, which will transformation the terms of the messages for definite purpose (for example, coordination of the terms on sense, coordination of various models of representation of knowledge etc.) [14].

The knowledge clusters dictionary also semantic interaction between a set of the general terms and contexts used local DFDBMS.

At such architecture the logic division between DFDBM

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4. Fuzzy object-oriented model of application domain:

Data in the database are presented as a fuzzy graph FG = (S, R). S is the set of states of the catalytic cracking unit and its separate blocks. R is relations among them.

The model of database is selected so that the objects and relations among them are represented as fuzzy classes and associations. Database objects are physical objects (row, hydro-refining, reactor, regeneration column, catalytic cracking etc.) and states of the technological process (states of hydro refining, state of catalytic cracking, state of reactor, state of regeneration). The objects are represented as fuzzy classes [*1*].

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Fuzzy class is a class with fuzzy boundary. For example, fuzzy classes "reactor", "row", "regenerator" has some fuzzy boundaries with respect to their attributes. For examples, "high reactor temperature", "low consumption of tow", "low reactor of temperature" has fuzzy boundaries. Crisp (exact) values of attributes are also represented as fuzzy numbers with the membership function equal to 1. Fuzzy class is defined as follows:

$$FC = \left\{ \left(o_{ij}, a_{ij}, \mu(o_{ij} \right) / o_{ij} \quad is\, object, a_{ij}\, is\, attribute, 0 < \mu(o_{ij}, a_{ij}) \le 1 \right\}$$

Where $\mu(o_{ij})$ is membership function of j-th attribute for object o_{ij} in fuzzy class FCi. The pair $(o_{ij}.a_{ij}, \mu(o_{ij}))$ is called a fuzzy object. An example of fuzzy object of fuzzy object is: (reactor, low temperature, 0.96).

Each object is assigned by system a unified identifier. Fuzzy objects are objects which have varying and not predefined states. This implies they may have fuzzy values of state attributes and fuzzy associations among objects.

Fuzzy associations define relations among the objects of another class. There are different types of associations.

Fuzzy associations are relations with fuzzy semantics. At the level of objects, fuzzy association is defined as an association, the object of which has fuzzy relations among them.

$$FA_{im}(k) = \{((o_{ij}, o_{wd}), R_{(k)}(o_{ij}, o_{wd}))\ for all\ j$$
$$and\ d, (o_{ij}, \mu(i_{ij})) \in FC_m\ and\ 0 \le R_{(k)}(o_{ij}, o_{wd}) \le 1\}$$

Where $R_{(k)}(o_{ij}, o_{mn})$ is level of relation between the objects o_{ij} and o_{wd}, k is the identifier of association. The identifier is needed from the viewpoint of the determination of [*3*] types of relations among fuzzy objects on solving different problems. For example, for the combined catalytic unit the relations are defined for task of control, diagnosis, and forecasting.

When doing each of these tasks, the fuzzy objects relations of different types.

5. Conclusion

There are differences between the hierarchical, the retinal and the relational: the hierarchical and network models use links or pointers to link records in the system. These systems are called static or monolithic systems because the records are bound together physically through their definitions, these systems are characterized as complex work and difficult to modify, but the speed of access in which cover their flaws.

Technologies such as Big Data and Artificial Intelligence are being used around the world in an effort to stop the spread of the new Corona virus. Most institutions have facilitated access to data as a map of the spread of the emerging corona virus.

Today's digital transformation in countries enables a huge amount of big data that helps in analyzing the reality and foreseeing the future. Today, it is the main focus in facing the emerging corona pandemic.

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For example, many governments seek to use geolocation data for smartphones to ensure that mandatory quarantine is respected and not roamed. Consequently, the various health data that can be provided as open data play a major role in the battle to eradicate the emerging corona pandemic. In relational systems, the link between records is not made physically by indicators, but by the real names of the fields, such as fields of employee number, name or card number. The records in this system can be labeled Connect-Addressable so that they are accessed by matching stored data values with each other.

Non-Relation Database: In this system creates a large table, Table Data Base contains all the data in this type of system, many of which are duplicate data.

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