

# Current and Future Trends of Database

Mrs. Mitali Lade<sup>1</sup> Mr. Vinayak Shinde<sup>2</sup>

<sup>1,2</sup>Department of Computer Science and Engineering

<sup>1,2</sup>Maharashtra state, Mumbai University

**Abstract**— Database plays a very important role in our today's world. This research activity tells us the brief idea about the different types of DBMS and their applications with their advantages and disadvantages. In this research activity we review the evolution of database management systems and then focus on the most recent database developments discussing research and implementation challenges done by modern database applications.

**Key words:** Relational Databases, Object-Relational Databases, Object-Oriented Databases, Hierarchical Database

## I. INTRODUCTION

Various researches have revealed that whenever we hear an object, we recover it using an image from our brain. Suppose, if I ask you "Do you like apples?". You won't think of the alphabets "a", "p", "p", "l", "e", instead you will recall all relevant information regarding apple using the image of an apple. This is how our data processing in our brain work. Of course it is complicated and highly efficient. Now suppose if I ask you "What is a database?", you will probably think of a collection of tables related to each other. If the same question was asked to a person in 1990s, possibly he would have only thought of a single big table from which they recover all the information. But today we have really moved on from this simplistic definition of databases. This article will help you understand what type of database exists currently.

A database is an organized collection of data. A database is the collection of schemas, tables, queries, reports, views and other objects. A database management system (DBMS) is computer software application that interacts with the user, other applications, and the database itself to analyze data. A general-purpose DBMS is designed to know the definition, creation, querying, update, and administration of databases. DBMSs include MySQL, PostgreSQL, Microsoft SQL Server, Oracle, Sybase and IBM DB2. A database is not portable across different DBMSs, but different DBMS can interoperate by using standards. These standards such as SQL and ODBC or JDBC allow a single application to work with more than one DBMS. Database management systems are classified with reference to the database model that they support. The most popular database systems from 1980s have all supported the relational model which are represented by the SQL language.

## II. THE EVOLUTION OF DATABASE

### A. Flat File Database:

This database is easier to understand but at present rarely used. You can think of this as a single huge table. These datasets were used long back in 1990s, when data was used to recover information in case of concerns. Very primitive logical ways were possible on these database. It is database which is stored on its host computer system as an ordinary "flat file". To access the structure of the data and control it, the file must be read in its entirety into the computer's

memory. After completing the database operations, the file is again written out in its entirety to the host's file system. In this mode the database is "flat", means it has no structure for indexing and there are no structural relationships between the records. A flat file can be a plain text file or a binary file.

### B. Relational Database:

Flat File has a lot of redundant data at every entry. Suppose, if I want to make a single data-set with all products purchased at a grocery store with the information of the customer and product, then we will have every single row consisting of all customer and product information. Wherever we have a repeat product or customer, we have repeated data. People thought of storing this as different tables and hence define a hierarchy to access all the data. This is known as hierarchical database.

### C. Hierarchical Database:

It is very similar to your folder structure on the laptop. Every folder can contain sub-folder and every sub-folder can still hold more sub-folders. Finally in some folders we will store files. However, every child node will have a single parent. Finally, we can create a hierarchy of the dataset

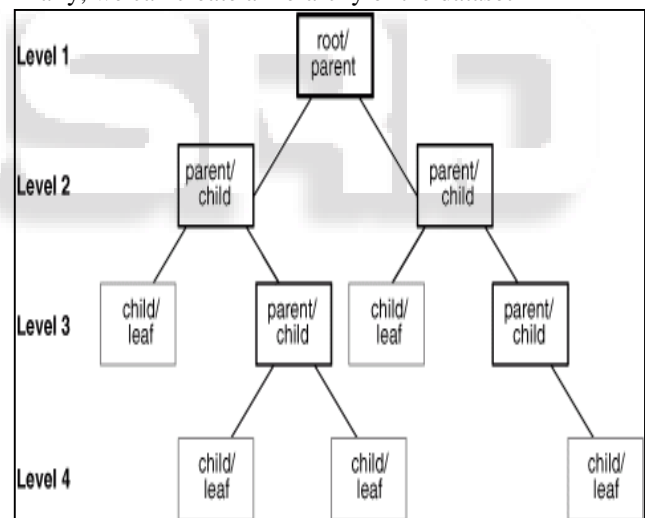


Fig. 1:

Hierarchical databases can solve many problems, its applications are restricted to one-to-one mapping data structures. That is, it will work well if you are using the above data structure to show job profile hierarchy in a corporate. But the structure will fail if the reporting becomes slightly more complex and a single employee reports to many managers. Hence, people thought of database structures which can have different types of relations. This type of structure should allow one-to-many mapping. Such table came to be known as Relational database management system (RDBMS).

Following is an example RDBMS data structure :



Fig. 2:

As you see from the above diagram, there are multiple keys which help us to merge different data sets in this data base. This kind of data storage optimizes disc space occupied without adjusting on data details. This is the data base which is generally used by the analytics industry. When the data loses a structure, then the data base will be of no use.

#### D. Nosql Database:

NoSQL is also known as “Not Only SQL”. When people became aware of unstructured text carry tonnes of information which they are inadequate to mine using RDBMS, they started discovering ways to store these datasets. Anything which is not RDBMS today is known as NoSQL. After social networks obtained importance in the market, such database became common in the industry.

#### E. Object-Relational Database:

Object-relational database management systems grew out of research that occurred in the early 1990s. An (ORDBMS) is a database management system which is similar to a relational database, besides that it has an OODB model. This system supports objects, classes and inheritance in database schemas and query language. Object relational database management systems provide a middle ground between relational and object-oriented databases. In an ORDBMS, data is examined using queries in a query language. These systems bridge the gap between conceptual data modeling techniques known as entity relationship diagrams and object relational mapping using classes and inheritance. ORDBMSs support data model extensions with custom data types and methods. This allows developers to increase the abstraction levels at which problem domains are viewed.

#### F. Object Database:

Object database management systems grew out of review during the early to mid-1970s into having intrinsic database management support for graph-structured objects. Object-oriented database management system (OODBMS), also known as ODBMS for object database management system), is database management system (DBMS) that supports the modelling and creation of data as objects. It also includes some kind of support for classes of objects and inheritance of class properties and methods by subclasses and their objects. There is currently no widely agreed standard for what constitutes an OODBMS, and these products are considered

to be still in their early life. In the meantime, the object-relational database management system (ORDBMS), is the idea that object-oriented database concepts can be superimposed on relational databases, is commonly engaged in available products. Object-oriented database interface standard is being advanced by an industry group, Object Data Management Group (ODMG). The Object Management Group has already standardized an object-oriented data brokering interface between systems in a network.

### III. APPLICATIONS AND USES

A Database management system is a computerized record-keeping system. It is repository or container for collection of computerized data files. The overall purpose of DBMS which allows the users to define, store, retrieve and update the information contained in database on demand. Information can be anything that is of significance to individual or organization.

Databases touch all aspects of our lives. Few of the major areas of application are as follows:

- 1) Bank
- 2) University
- 3) Manufacturing and selling

Uses of DBMS: Data that well organized and integrated very useful in decision making. Thus, we can deduct some of the following uses of DBMS:

- 1) Effective and efficient management of data
- 2) Query processing and management
- 3) Easy to understand and user friendly
- 4) Security and integrity of data
- 5) Better Decision making

### IV. CONCLUSION

Thus from our research we have reviewed an interesting observation noting that the database research community has doubled in size. But at the same time there was perception that the quality of review has been decreasing over time. Recent rise of the NoSQL movement whose proponents regard the existing relational DBMSs as inefficient, complex and expensive, and favor open source non-relational solutions, demonstrates this point. A key to understanding present and future database developments is firm view of what constitutes the database paradigm, i.e. defining the scope of database research problems.

### REFERENCES

- [1] <http://www.cpaireland.ie/docs/default-source/Students/F2-Info-Systems/database-resources-nbsp-.pdf?sfvrsn=0>
- [2] <http://ceur-ws.org/Vol-567/invited1.pdf>
- [3] <https://mhaadi.wordpress.com/2010/10/18/the-evolution-of-database/>
- [4] <http://www.analyticsvidhya.com/blog/2014/11/types-databases-evolution/>
- [5] <http://www.yourarticlelibrary.com/accounting/computer-ized-accounting/database-management-system-dbms-applications-uses-and-other-details/63278/>
- [6] <http://www.myreadingroom.co.in/notes-and-studymaterial/65-dbms/462-advantages-and-disadvantages-of-dbms.html?hitcount=0>