An Overview of Database Management Systems and their Applications Along with the Queries for Processing the System

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Abstract

A database management system is a collection of inter-related raw data, which contains set of programs or instructions to access those data. The huge collection of data usually known as Database, which contain information that is relevant to access the data. The goal of this management system is to provide a way to store and retrieve information that is stored in the database. The information that are stored in the database are more convenient and efficient. This paper discusses on the application used in database management system and how the data in the application are related by describing the background of DBMS.

Keywords

Queries, Database, Application, Schema, abstraction, Relationship model.

I. INTRODUCTION

Database management system is responsible for accessing data, inserting, updating and deleting the data stored in the database[1]. It supports the user interface packages by maximizing the availability of a user. The database management system is categorized into three types they are: Hierarchical, Relational and Network. The database management system is a set of rules or procedures which are used to create, organize and manipulate the data. They handles the data in different levels of an abstraction which are named as Data Abstraction. The Data Abstraction is process of hiding the unwanted information and reveal the data required to the user. The three levels of abstraction are: External schema, Conceptual schema and internal schema. The term schema means arranging the data stored in the database.

The internal schema is a lowest level of abstraction, they describe how the raw fact or data items are stored in the physical storage such as hard disk, tape drive, etc. and also they define the data type, size and the location of their stored in the physical device. This type of storage system is useful for data administrator and database application developer. Whereas, the conceptual schema is a middle level, they describe the structure of an entire database by using the common attribute to the different tables, which helps to combine or relate different tables.

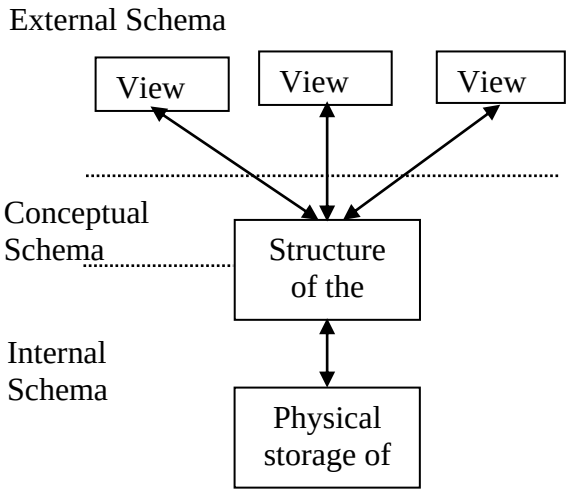

Figure 1: Level of Abstraction in Data base management system

This schema is useful for the database administrator where they have the responsibility of maintaining or controlling the entire databases. The highest level of abstraction is external schema, it supports for an end user who does not need to know the entire structure of database. Their task is to manage the amount of data by user retrieval and hides the information from unauthenticated users.

II. OVERVIEW OF DATA MODEL

A data model represents the nature of data, rules governing the data and how we organize in the database. The data models contains key database objects such as tables, columns, relationships and constraints. The database management system provides data independence, concurrency control, provides utility services and recovery services.

A. Entity-Relationship model

E-R model is based on the perception of a real world, which consist of collection of basic objects

called as entities and relationship among those objects. Entities in the database are described by set of attributes. Relationship is an association several entities. E-R model consist of several components like rectangle, ellipse, diamonds and line.

B. Relational model

Relational database is based upon relational model such as collection of tables to represent the data and to represent the relationship among those data. Relational database include DML, DDL and DCL.

C. Object based data model

Object oriented data model is based upon the object oriented programming concepts. Inheritance, encapsulation, object-identity provides key concept of object oriented programming language. Object relational data model extend the traditional relational model.

D. Semi-structured data model

In this model, same type of data items have different set of attributes. XML language was designed for adding up a markup information to text document.

III. TYPES OF RELATIONAL DATA MODEL

A. Data Definition Language(DDL)

The DDL is special language which uses special type of statements called as data storage and definition language. The DDL is used to create database name and tables by defining the data type of an attribute. In DDL we use constraints of an attribute by declaring the primary and foreign key which creates a unique identity of a data and it does not contain null values. The database management system mainly concentrates on the integrity constraints of an attribute such as domain constraints, authorization, referential integrity and assertions.

B. Data Manipulation Language(DML)

Data manipulation language is a process of accomplishing a task in a database of the entities. The task involved in DML are insertion, deletion, select and update. DML allows the user to interact with a massive amount of data. This language is categorized into two different types: Procedural programming and Declarative programming. The procedural programming language is based upon the concept of a procedural call and the term procedure means functions. Declarative language is programming model which describes the process of expressing a logical computation without the control flow.

C. Data Control Language(DCL)

DCL is used to control the access of the user for authorization. It includes commands GRANT and REVOKE command. This concept involves admin and child user, the admin user provides privileges to the child user to access their data by providing the grant command. The same admin withdraws the privileges assigned to the child user by using the revoke command.

IV. QUERY

Query is a process of requesting information from a database. There are three general method used for processing a query

- Choosing a parameter from a menu
- Query by Example
- Query Languages [9]

Among these three method query languages are commonly used for processing the data in the database.

V. QUERIES USING LANGUAGES

Based upon three languages such as

- Data Definition Language (DDL)
- Data Manipulation Language (DML)
- Data Control Language (DCL)

The queries for the database management system can be created which can be very useful for the implementation of database management system in various fields.

I) Queries for the data base Operation

A. *To create new Database*[4]

```
CREATE DATABASE DatabaseName;
```

B. *To Show all existing Database*[4]

```
SHOW DATABASES;
```

C. *To Drop Database*[4]

```
DROP DATABASE Database Name;
```

II) Queries for Table Operation

A. *To create Table*[4]

```
CREATE TABLE tablename(

Column1 datatype,

Column2 datatype,

……

columnN datatype,

PRIMARY KEY(one or more columns)
```

```
);
```

B. ***To Insert data in table***[4]

```
INSERT INTO TABLENAME(column1,

column2……column)VALUES

(value1,value2……valueN);
```

C. ***To Display data in table***[4]

```
SELECT * FROM tablename;
```

D. ***Update table***[4]

```
UPDATE tablename SET column1 = value1,

column2 = value2……..,

columnN = valueN where[condition];
```

E. ***To drop table***[4]

```
DROP TABLE tablename;
```

F. ***To delete table***[4]

```
DELETE FROM tablename WHERE (condition);
```

III) Condition clause

A. ***WHERE CLAUSE***[4]

```
SELECT column1

column2……column FROM tablename WHERE [condition];
```

B. ***AND CLAUSE***[4]

```
SELECT column1,column2……column FROM tablename WHERE [condition1] AND [condition2]

…..AND[conditionN];
```

C. **OR CLAUSE**[4]

```
SELECT column1,column2……column FROM tablename WHERE [condition1] OR [condition2]

…..OR[conditionN];
```

So using these queries the database management system can be applied for the various application. Some of the application to which the data base management system are applied are discussed below.

VI. APPLICATION OF DBMS[3]

DBMS is application software that enables user interaction and allows other applications to capture and analyze data. Databases allows online transaction in websites between suppliers and users and also employed in internal data processing within organizations. Certain applications include library management, flight reservation system, banking, inventory management, etc. These applications are discussed one by one briefly.

A. Banking system

Database management system is used for maintaining client information, generating statements, tracking day-to-day credit and debit transaction details

B. Education system

It helps to maintain interconnection records to effectively store, maintain and access information. The interrelated records can be effectively accessed with ease. It stores data related to students, exams, scores, attendance, fees, course, staff, payroll, etc.

C. Industry

DBMS is used in various sites of the industry like distribution centre, warehouse, and manufacturing unit. The distribution centre maintains information about the products supplied and delivered.

D. Military

In military to keep a record of millions of files and record of million soldier's safe and secure the Dbms plays a major role. It provides a big security to keep safe of military soldiers.

E. Online shopping

Today the online shopping becomes more popular in the world. During online shopping the details of purchase information, payment details are stored using dbms. Each and every detail are stored in the database for the easy and quick retrieval of information in the future.

F. Airline Reservation system

The details of air flight departure, Arrival of flights and delay of flights are stored in dbms. These make the passenger more comfortable to travel.

G. Railway Reservation system

In the Railway reservation system the dbms plays a vital role. The each and every details of the train is stored using dbms. The details of train such as train name, train PNR status, train arrival, train departure are stored and retrieved easily using the data base.

H. Credit card transactions

The credit card transactions during the purchase of the items and online transaction using credit card are stored using the dbms. Each and every time after using credit card the details are updated in the database.

I. Social Media

Today more number of peoples is using social media. All information about the user, views of the users are stored in the dbms. This information storage helps the social media operator to check the information relevant to number of users accessing the social media daily; Location of the users and the details of the users can be accessed and viewed easily through this data base management system.

VII. CONCLUSION

There are large and enormous development in the data base management system butthis paper provide an overview of Database management system concepts, application, Queries for processing the database system. Database development processes involve the information gathering, computation, searching of information. The database expresses a concept that have evolved and changed gradually. The implementation of this concepts of data base management system causes the improvement over the hardware and software technology .This development over the information technology provide a work of the human beings more easier and simpler and it take less time to process the system also. By this there is rapid increase and development over the information technology all over the world in the upcoming years also.

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