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**ASSESSMENT- 2**

**RDBMS:**

RDBMS stands for Relational Database Management Systems. It is basically a program that allows us to create, delete, and update a relational database. A Relational Database is a database system that stores and retrieves data in a tabular format organized in the form of rows and columns. It is a smaller subset of DBMS which was designed by E.F Codd in the 1970s. The major DBMSs like SQL, My-SQL, and ORACLE are all based on the principles of relational DBMS.

Relational Database Management Systems maintains data integrity by simulating the following features:

* Entity Integrity: No two records of the database table can be completely duplicate.
* Referential Integrity: Only the rows of those tables can be deleted which are not used by other tables. Otherwise, it may lead to data inconsistency.
* User-defined Integrity: Rules defined by the users based on confidentiality and access.
* Domain integrity: The columns of the database tables are enclosed within some structured limits, based on default values, type of data or ranges.

**Characteristics of RDBMS**

1. Data must be stored in tabular form in DB file, that is, it should be organized in the form of rows and columns.
2. Each row of table is called record/tuple . Collection of such records is known as the cardinality of the table
3. Each column of the table is called an attribute/field. Collection of such columns is called the arity of the table.
4. No two records of the DB table can be same. Data duplicity is therefore avoided by using a candidate key. Candidate Key is a minimum set of attributes required to identify each record uniquely.
5. Tables are related to each other with the help for foreign keys.
6. Database tables also allow NULL values, that is if the values of any of the element of the table are not filled or are missing, it becomes a NULL value, which is not equivalent to zero.

**Online Analytical Processing (OLAP):**

OLAP stands for Online Analytical Processing. OLAP systems have the capability to analyze database information of multiple systems at the current time. The primary goal of OLAP Service is data analysis and not data processing.

Online Analytical Processing (OLAP) consists of a type of software tool that is used for data analysis for business decisions. OLAP provides an environment to get insights from the database retrieved from multiple database systems at one time.

Any type of Data Warehouse System is an OLAP system. The uses of the OLAP System are described below.

* Spotify analyzed songs by users to come up with a personalized homepage of their songs and playlist.
* Netflix movie recommendation system.

**Benefits of OLAP Services**

1. OLAP services help in keeping consistency and calculation.
2. We can store planning, analysis, and budgeting for business analytics within one platform.
3. OLAP services help in handling large volumes of data, which helps in enterprise-level business applications.
4. OLAP services help in applying security restrictions for data protection.
5. OLAP services provide a multidimensional view of data, which helps in applying operations on data in various ways.

**Drawbacks of OLAP Services**

1. OLAP Services requires professionals to handle the data because of its complex modeling procedure.
2. OLAP services are expensive to implement and maintain in cases when datasets are large.
3. We can perform an analysis of data only after extraction and transformation of data in the case of OLAP which delays the system.
4. OLAP services are not efficient for decision-making, as it is updated on a periodic basis.

**Online Transaction Processing (OLTP):**

OLTP stands for Online Transaction Processing. OLTP has the work to administer day-to-day transactions in any organization. The main goal of OLTP is data processing not data analysis. Online transaction processing provides transaction-oriented applications in a 3-tier architecture. OLTP administers the day-to-day transactions of an organization.

An example considered for OLTP System is ATM Center a person who authenticates first will receive the amount first and the condition is that the amount to be withdrawn must be present in the ATM. The uses of the OLTP System are described below.

* ATM center is an OLTP application.
* OLTP handles the ACID properties during data transactions via the application.
* It’s also used for Online banking, Online airline ticket booking, sending a text message, add a book to the shopping cart.

**Benefits of OLTP Services**

1. OLTP services allow users to read, write and delete data operations quickly.
2. OLTP services help in increasing users and transactions which helps in real-time access to data.
3. OLTP services help to provide better security by applying multiple security features.
4. OLTP services help in making better decision making by providing accurate data or current data.
5. OLTP Services provide Data Integrity, Consistency, and High Availability to the data.

**Drawbacks of OLTP Services**

1. OLTP has limited analysis capability as they are not capable of intending complex analysis or reporting.
2. OLTP has high maintenance costs because of frequent maintenance, backups, and recovery.
3. OLTP Services get hampered in the case whenever there is a hardware failure which leads to the failure of online transactions.
4. OLTP Services many times experience issues such as duplicate or inconsistent data.

**SQL:**

SQL stands for Structured Query Language and is a computer language that we use to interact with a relational database.

SQL is a tool for organizing, managing, and retrieving archived data from a computer database. The original name was given by IBM as Structured English Query Language, abbreviated by the acronym SEQUEL. When data needs to be retrieved from a database, SQL is used to make the request. The DBMS processes the SQL query retrieves the requested data and returns it to us. Rather, SQL statements describe how a collection of data should be organized or what data should be extracted or added to the database.

In common usage, SQL encompasses DDL and DML commands for CREATE, UPDATE, modified, or other operations on database structure.

**Uses of SQL**

Data definition: It is used to define the structure and organization of the stored data and the relationships among the stored data items.

Data retrieval: SQL can also be used for data retrieval.

Data manipulation: If the user wants to add new data, remove data, or modifying in existing data then SQL provides this facility also.

Access control: SQL can be used to restrict a user’s ability to retrieve, add, and modify data, protecting stored data against unauthorized access.

Data sharing: SQL is used to coordinate data sharing by concurrent users, ensuring that changes made by one user do not inadvertently wipe out changes made at nearly the same time by another user.

**MYSQL:**

MySQL is the most widely adopted opensource relational database and serves as the primary relational data store for many popular websites, applications, and commercial products.

**Features of MySQL:**

1. MySQL is written in C and C++ and its SQL parser is written in yacc(Yet Another Compiler Compiler).
2. MySQL uses only just under 1 MB of RAM on your laptop while Oracle 9i installation uses 128 MB
3. MySQL is great for database enabled websites while Oracle is made for enterprises.
4. MySQL is portable.
5. MySQL default port number is 3306.