

ASSIGNMENT NO: 2

Name: Pratik Wani

Problem Statement: Explain the concepts RDBMS, Data Warehousing, OLTP vs OLAP,

Solution:

➤ RDBMS:-

- Relational Database Management System (RDBMS) is a type of database management system that organizes data into tables, which consist of rows and columns.
- It is a program that maintains the relational databases
- RDBMS provides a platform where we can run different SQL queries to perform CRUD operation on relational databases
- The examples of RDBMS are MySQL, Microsoft SQL Server and Oracle.

➤ Data Warehouse:-

- Data Warehouse is a huge amount of data storage which collects the data from multiple heterogeneous sources like Flat files, RDBMS, etc.
- Data Warehouse is different from normal databases, Ordinary databases can only perform Transactional operations but we can't use them for analytical purpose that is why organization need a data warehouse which can keep there historical data for making strategic decisions and analyzing different business trends.
- Data Warehouse is Subject Oriented, Integrated, Time variant and Non Volatile collection of data

➤ Features of Data Warehouse:-

- Subject oriented:
 - Data is stored on the basis of subjects and the main focus is on modeling and analysis of data for decision making
- Integrated:
 - Data is collected from various heterogeneous sources like Binary files, RDBMS and flat files.
 - It maintains the Consistency in data.
- Time-variant:
 - Data Warehouse stores historical data of the organization hence its time horizon is usually large. Ex. Placement ratio of college over last 10 years
- Non-volatile:
 - Once the data entered into the data warehouse, we can't remove that data
 - We can't update the data

➤ MySQL:-

- MySQL is an open-source relational database management system (RDBMS).
- over 100 million copies of its software downloaded and it shares almost 65% of total market shares
- MySQL provides a platform where we can run SQL to query the database

➤ Features of MySQL:

- Open Source:
 - MySQL is freely available for use, modification, and distribution.
- Ease of Management:-
 - It is an easy to use and simple database system.
 - It's Installation is easy and it just takes 1MB of ram which shows that it is memory efficient as well
- High Performance:-
 - MySQL is faster, robust, and cheaper.
 - MySQL has features such as Stored procedures and Triggers that allow the users to give higher performance
- Cross-Platform Support:-
 - MySQL is compatible with various operating systems, including Windows, Linux, macOS.
- Scalability:
 - MySQL can handle large amounts of data and it is scalable according to need. It supports both vertical and horizontal scaling.

➤ OLTP vs OLAP:-

- OLTP:

- The main goal of OLTP architecture is data processing not data analysis
- OLTP is use by the Relational Databases
- It provides provide end users with access to large amounts of data
- OLTP performs the day to day transactions in the organizations
- Example of OLTP is ATM machine which performs hundreds of money transaction on daily basis

- OLTP Basic Architectural flow:

Raw Data/Audit Tables → Data Warehouse → Analysis, Data Mining

- Benefits of OLTP:

- Simple: Simple to handle the queries
- Less paper work
- Faster and Accurate results
- It has different constraints to main the consistency and integrity in database

- Drawbacks of OLTP:

- Need to update it frequently
- We can't use these table format data for analytical purpose
- To get some simple data we need to use subquery and joins
- Because of these reasons we need some central data house which keeps the huge historical data and can be used for analytical projects that's reason *Data warehouses* comes in picture

- OLAP:
 - The main goal of OLAP architecture is data analysis not data processing
 - OLAP is use by the data warehouses
 - It is use to answer to answer multi-dimensional analytical queries which also adds the functionalities of data mining.

- OLAP Architectural flow:

ETL Process → Data Warehouse → OLAP server → Query Output shown to user using frontend tools

- OLAP Servers:
 - *ROLAP (Relational OLAP)*: It performs dynamic multi-dimensional analysis of data which is stored in a relational databases.

 - *MOLAP (Multi-dimensional OLAP)*: It provides multi-dimensional analysis of data with the help of cube structure. It enables user to access the information by slicing and dicing

