**17/07/2025 - ASSIGNMENT**

**1. An Introduction to Data Warehousing**

Think of a data warehouse as a huge digital library where a company stores all its important data sales, customer info, transactions, and more from different departments. But unlike normal storage, this library is arranged in a way that makes it super easy to find patterns, ask big questions, and get useful answers. It’s mainly used by business analysts and decision-makers, not for daily operations but for understanding the bigger picture.

**2. Purpose of Data Warehouse**

Why do we need it? Simple: businesses generate tons of data every day, and it's all scattered across different systems. A data warehouse brings everything together in one clean, consistent place. This helps leaders make better decisions, spot trends, and solve problems faster. It’s like having a bird’s-eye view of the entire business instead of looking at it through a small window.

**3. Data Warehouse Architecture**

You can imagine the architecture like building a house with three floors:

* On the ground floor, you collect the raw materials (data from different sources).
* On the middle floor, you clean and organize them (this is where ETL happens—Extract, Transform, Load).
* Finally, on the top floor, you set everything up neatly so people can walk in and use it easily (this is where analysts and managers use dashboards and reports).

Each part has a role: collecting, cleaning, and presenting data.

**4. Operational Data Store (ODS)**

An ODS is like a mini version of a data warehouse, but faster and more immediate. If the warehouse is a full report card, the ODS is like your current attendance sheet. It’s updated constantly and is used for day-to-day decisions, like tracking today's inventory or sales. But it doesn’t store years of history like a warehouse does.

**5. OLTP vs Warehouse Applications**

OLTP systems are used for daily tasks like when you swipe your card, place an order, or book a ticket. These systems are fast and deal with live transactions.

But a data warehouse is for deep thinking. It's used to answer big questions like: “What were our best-selling products last year?” or “Why are profits going down in one region?” You don’t use it to make a sale you use it to analyze sales.

**6. Data Marts**

Imagine your college library has different rooms—one for engineering books, one for arts, one for science. A data mart is like one of those rooms. It’s a smaller, focused version of a data warehouse created for one specific department—say, just for finance or marketing. It helps them work faster without searching through the entire library.

**7. Data Marts vs Data Warehouse**

To keep it simple: a data mart is like a personal desk for a department, while a data warehouse is the whole building. The warehouse holds everything. A data mart is smaller, quicker to build, and serves a specific purpose but both are about storing and analyzing data smartly.

**8. Data Warehouse Life Cycle**

Building a data warehouse is like starting a big project or even building a house:

1. First, you understand what the users need (like choosing the house design).
2. Then, you design the structure how to store and connect data.
3. Next, you build the pipelines to collect and clean data.
4. Then, you set it up for users to access.
5. After that, you test it carefully to make sure it’s working right.
6. Finally, you keep it running smoothly and improve it over time as the business grows.