# Day -1 Summary of Data Warehouse Concepts

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❖ **Data Warehouse (DW)** - a database used for data reporting and analysis. *Subject oriented, integrated, time variant, non-volatile* collection of data. Supports management decisions

❖ **Features** - *Subject oriented, integrated, time variant, non-volatile.*

❖ **Need for Decision Support System(DSS)** – for quick decision making.
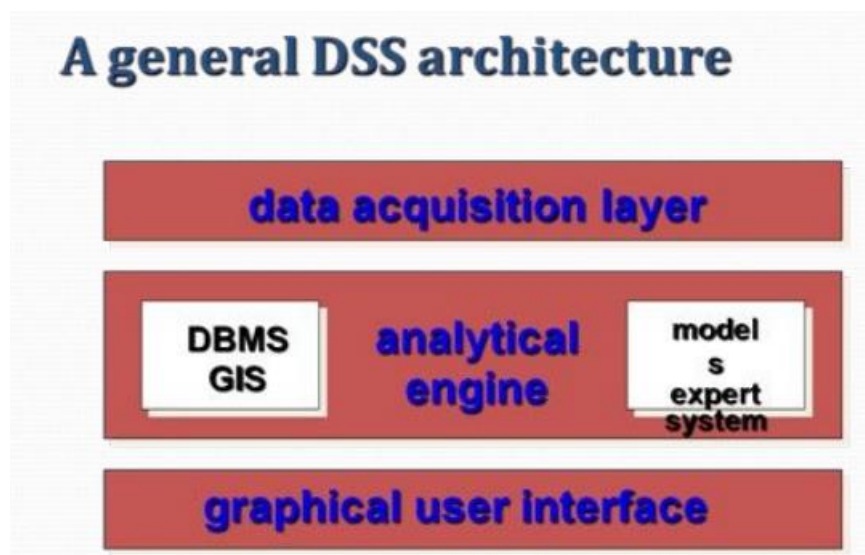
❖ **Structured and Unstructured components of DSS:**
1. A Structured component - helps us to proceed towards decision.
2. An Unstructured component – still to be processed and requires human interaction with the DSS.

❖ **DSS architectural styles**

➢ OLTP (Online Transaction Processing) -used by traditional operational systems (RDBMS).

➢ OLAP (Online Analytical Processing) -used by Data Warehouse

- ❖ **OLTP** - a methodology to provide end users with access to large amounts of data. Works in an intuitive and rapid manner
- ❖ **Benefits –** simple and efficient, maintains data integrity. **Disadvantages** - requires instant update, not suitable for data analysis, we need to query multiple tables by using joins.
- ❖ **Data store** contains two main types of data. Business Data ,Business Data Model.
- ❖ **ETL (Extract Transform Load)** -based data warehouse uses a) staging, b) integration and c) access layers.
- ❖ The data that arrived at data warehouse are first passed to *Operational Data Store (ODS).*
- ❖ **DSS components** -Data store component, Data extraction component, Data filtering component, End user query tool ,End user presentation tool.
- ❖ The data in the data warehouse is stored in the form of **Data marts.**
- ❖ **Data mart** - a subset of the data warehouse that is usually oriented to a specific business line or team.
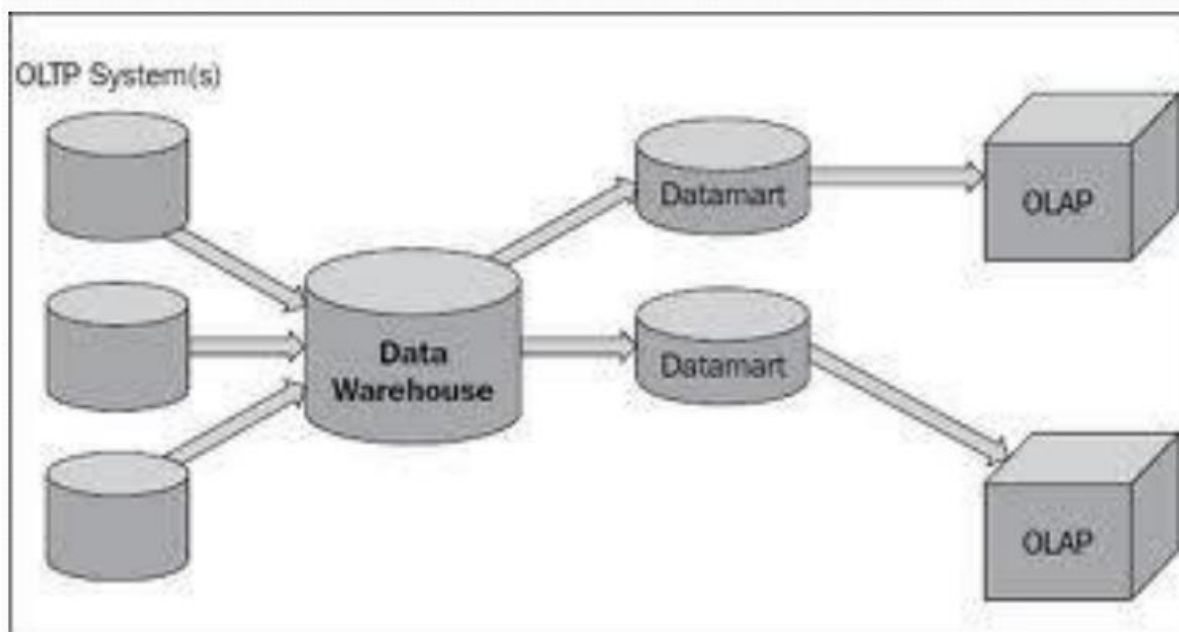
- ❖ **OLAP(Online Analytical Processing) -** an approach to answer multi-dimensional analytical queries which also encompasses relational reporting and data mining.
- ❖ **OLAP cube** - an array of data that is understood in terms of its 0 or more dimensions which enables the users to gain insight into their data in a fast, interactive, easy-to-use manner.

OLAP Architecture
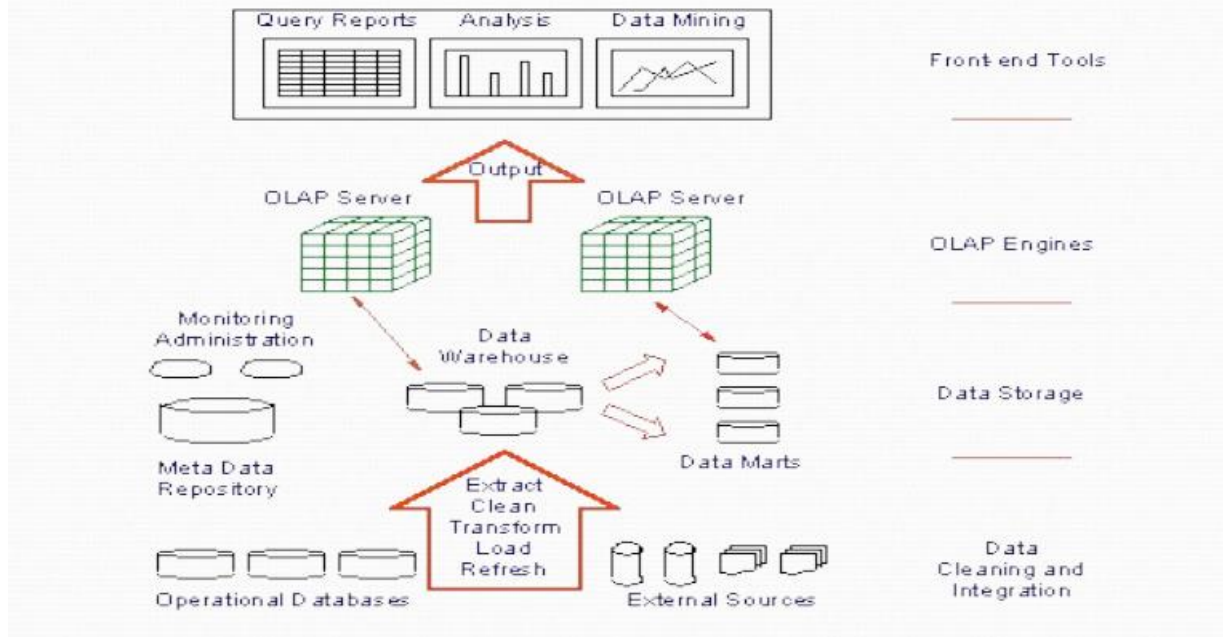
- ❖ **OLAP Server** - receives the data from data warehouse by which it represents the data in a user understandable format. Performs data analysis in two forms. ROLAP(Relational OLAP) , MOLAP(Multi-dimensional OLAP).
- ❖ **ROLAP** - analysis of data stored in a relational database
- ❖ **MOLAP**- provides multi-dimensional analysis of data by putting data in a cube structure.
- ❖ **DWH Applications**- Information processing, Analytical Processing, Data Mining