# DATA WAREHOUSE

## Introduction:

A data warehouse is a single location that houses combined information from several different sources. Supporting business intelligence (BI) tasks, specifically analytics, reporting, and data mining, is its main goal. Data warehouses are focused on querying and analysis, as opposed to transactional processes, which are the focus of operational databases.


## Important Characteristics:

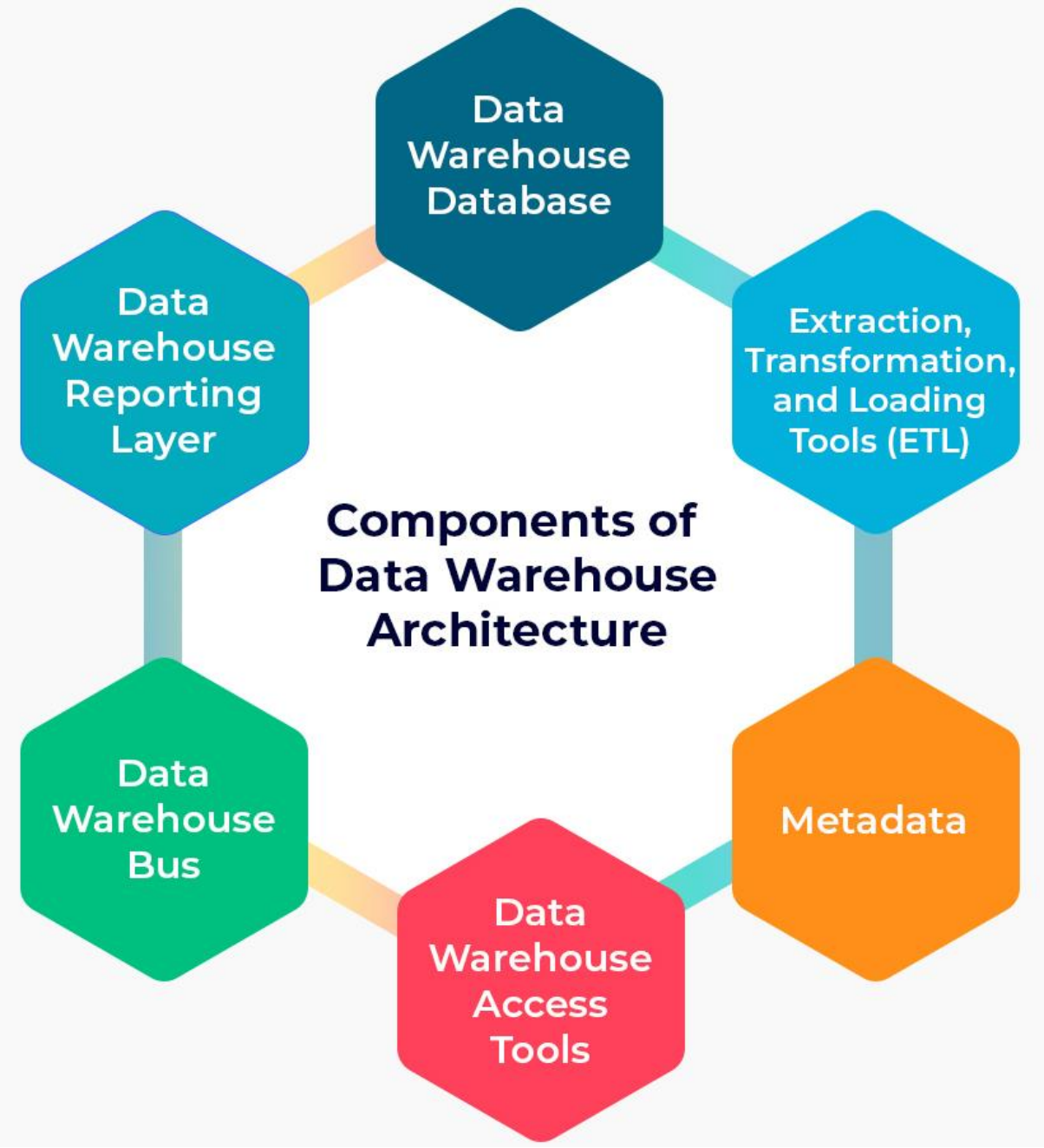
**Subject-Oriented:** Structured according to important business topics, such as inventories, sales, or clients.

**Integrated:** Merges information from several sources, guaranteeing uniformity in encoding, formats, and names.

**Non-Volatile:** Data is read-only for analytical purposes and is stable once entered.

**Time-Variant:** Provides historical information to back up time-based trends and analysis.

## Components of a Data Warehouse:




### Data Warehouse Database:

The Data Warehouse Database is the central storage system that houses all integrated, historical, and analytical data

### ETL Process:

**Extract**: Retrieve data from source systems.

**Transform**: Cleanse and convert data into a suitable format.

**Load**: Store transformed data into the warehouse.

**Metadata:**

Information that describes other data, offering insights into data origin, structure, and usage, making it easier for users to interpret and utilize the data effectively.

**Access Tools:**

Business Intelligence (BI) applications, dashboards, and querying tools that allow users to interact with the data warehouse, generate reports, and perform in-depth analysis.

**Data Warehouse Bus:**

The Data Warehouse Bus is a design approach that ensures consistency and integration across different data marts within a data warehouse. It acts as a common framework or backbone by defining conformed dimensions and standardized facts that can be shared across various business areas.

**Reporting Layer:**

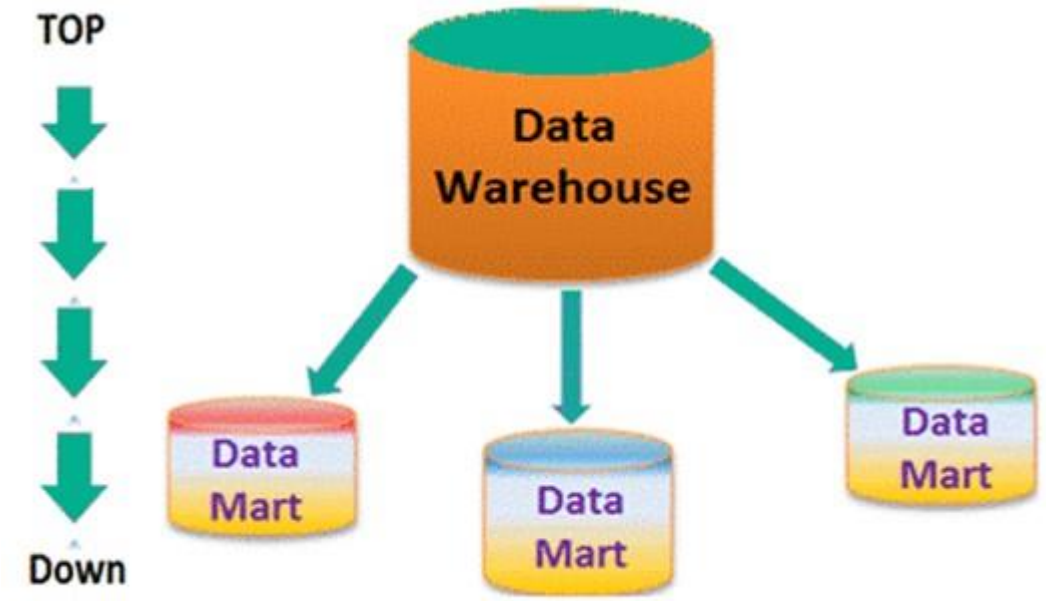
The Reporting Layer is the top layer of a data warehouse architecture that provides access to processed and structured data for end-users. This is where business users, analysts, and decision-makers interact with the data.

## Benefits:

- Supports **decision-making** with accurate, consolidated data.
- Enhances **reporting performance** compared to transactional databases.
- Allows **historical analysis** and trend discovery.
- Facilitates **data governance** and compliance.

## Data Mart:

A data mart is a subset of a data warehouse that is devoted to a particular department or business line, like marketing, finance, sales, or human resources. It includes a more condensed, topic-focused set of data that caters to the requirements of a certain user group inside an organization.

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## Essential Elements of a Data Mart:

**Focused on the subject**: Customized for a particular business domain (e.g., "Finance Data Mart" or "Sales Data Mart").

**Focused Scope**: Only includes information pertinent to the designated department or function.

**Faster Access**: Reports and queries can be produced faster than in a comprehensive data warehouse because of its constrained size.

**User-friendly**: Simpler for business users to comprehend and apply while making decisions.