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| **OLTP (Operational Data)** | **OLAP (Analytical Data)** |
| Designed for Transactions purpose (Business Purpose) | Designed for Analysis & Reporting Purpose |
| Data Modifications are frequent | Data Modifications are NOT frequent |
| Has Normalized Tables | Has De-Normalized Tables |
| Indexes NOT recommended | Indexes are recommended |
| Maintains Small Data | Maintains Large Data |
| More Users | Less Users (CEO ) |
| Read/Write Data | Read Only Data |
| Fresh Data | Historical Data |

**OLTP Vs OLAP**

Normalization is the technique of dividing the data into multiple tables to reduce data redundancy and inconsistency and to achieve data integrity.

Denormalization is the technique of combining data into a single table to make data retrieval faster.

Index is used to speed up the searching of the data in the database, Index requires its own space in the hard disk.

The drawback of the index is slow down execution time of UPDATE and INSERT statements.

They speed up the execution time of SELECT and WHERE statements.

**Data Warehouse means.**

* **It is a centralized large database.**
* **It stores integrated, summarized, and historical data for analysis and decision-making purposes.**

**Data Warehouse is a**

* **Subjected Oriented (Loans, Mutual Funds etc.)**
* **Integrated (Get data from various sources)**
* **Non-Volatile (Read only data)**
* **Time Variant (Different time period data)**

**ODS VS DWH**

**Data Mart**

* Data Mart is Subject Oriented
* DWH is collection of Data Marts
* DWH is super set of Data Marts
* Data Mart is also another database.

Type 0 (Overwrite):

* Functionality: Overwrites the existing record with the new data, making historical data inaccessible.

Type 1 (Row Versioning):

* Functionality: Creates a new record for each change, preserving historical data but leading to data bloat over time.

Type 2 (Attribute History):

* Functionality: Adds new columns to the existing record for each change, creating a history within the same row.

Type 6 (Hybrid):

* Functionality: Combines aspects of Type 1 and Type 2, creating new records for significant changes and adding new columns for minor changes.

Type 7 (Current Record Flag):

* Functionality: Utilizes a flag to indicate the current record, keeping only the current data and using historical tables for archived records.

1. **Type 0 SCD** – The Fixed Method
2. **Type 1 SCD** – Overwriting the old value by new values
3. **Type 2 SCD** – Creating a new additional record by row versioning
4. **Type 3 SCD** – Adding a new column to show the previous value
5. **Type 4 SCD** – Using historical table
6. **Type 6 SCD** – Combine approaches of types 1,2,3 (1+2+3=6) or Hybrid SCD