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|  | OLTP | OLAP |
|  | Focuses on real-time execution of large numbers of transactions | * Focuses on analyzing historical data trends and extracting insights. |
| Recourses used | * Databases: Often relational databases (RDBMS) optimized for transactional workloads. * Hardware: Server infrastructure with high-performance processors, storage, and network connectivity. * Software: Application servers, database management systems (DBMS), and transaction processing monitors (TPM) | * Data sources: Typically aggregate historical data from OLTP systems, data warehouses, or other data repositories. * Databases: Multidimensional databases (MDDBs) or specialized OLAP cubes for efficient multidimensional analysis. * Software: OLAP tools for building and managing OLAP cubes, visualizing data, and conducting analysis. |
| Purpose | * To process and manage real-time transactions in a high-throughput, efficient manner. * To ensure data integrity, consistency, and reliability for operational systems. | * To facilitate complex data analysis, uncover insights, and support decision-making. * To enable multidimensional analysis, drilling down, rolling up, slicing, and dicing data for comprehensive exploration. |
| usage | * Online banking systems: Processing transactions like deposits, withdrawals, transfers, and bill payments. * E-commerce platforms: Handling product searches, shopping cart management, order processing, payment processing, and inventory updates. * Airlines reservation systems: Booking flights, managing passenger information, checking seat availability, and issuing tickets. * Retail point-of-sale (POS) systems: Processing customer purchases, inventory updates, payment transactions, and loyalty program management. * Financial trading systems: Handling stock trades, order executions, market data updates, and account management. | * Business intelligence (BI) applications: Sales analysis, customer behavior trends, financial forecasting, inventory optimization, marketing campaign effectiveness, and more. * Data mining and predictive analytics: Identifying patterns, trends, and anomalies to make predictions and inform decisions. * Research and exploration: Uncovering insights from large datasets for various research and exploratory purposes. |

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|  | **Slicing** | **Dicing** |
| **Definition** | Cutting a data cube along one dimension to view a specific subset of data. It's like filtering the data based on a single criterion. | Cutting a data cube along multiple dimensions to isolate a smaller, more granular subset of data. It's like applying multiple filters simultaneously. |
| **Example** | Filtering by product category | Filtering by product category and region |
| **Number of dimensions used** | One | Multiple |
| **Resulting data granularity** | Less granular, broader view | More granular, focused view |

**Data Mart:**

A data mart is a subset of the data warehouse. It specially designed for a particular line of business, such as sales, finance, sales or finance. In an independent data mart, data can collect directly from sources.

هي sub set from dwh علشان افتح ليميت لكل بوزيشن حسب الريكويرمنت بتاعته مثلا مش اي حد يشوف الرواتب

بيكون عندي ال summery باخده من dwh زي مثلا ارباح بالنسبة لليوم كله مش كل دقيقة ف اليوم

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|  | Star scheme | Snowflake scheme |
| characteristic | -simple -join one level “query effective” -disadvantage (redundant), large table size because of de normalization  -every dimension represented by one table  -because less joins there exist problem in integration when table updated may not reflected to other | -extension to star scheme  -every dimension expanded in new table –no redundant  -desk space optimization  -many joins effect on performance |
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