① Difference between OLAP and OLTP

=> Online analytical processing (OLAP) and Online transaction processing system are data processing systems that help you store and internal systems, and analyze business data.

→ The primary purpose of online analytical is to analyze aggregated data, while the primary purpose of online transaction processing is to process database transactions

→ we use OLAP systems to generate reports, perform comple data analysis, and identify trends. In contrast, we use OLTP systems to process orders, update inventory, and manage customer accounts.

→ Other major differences include data formatting, data-architecture, performance and requirements

Differences :

i) Data formatting

OLAP systems use multidimensional data models, so con view the same data from different angles. OLAP databa store data in a cube format, where each dimension represents a different data attribute. Each cell repres a value or measure for intersection of dimensions

In constrast, OLTP Systems are uni-dimensional and focus on one data aspect. They use a relational database to organize data into tables. each row represent an entity inst

ii) Data Architecture

OLAP database architecture prioritizes data read over data write operations.

OLTP database architecture prioritizes data write operations.

iii) Performance

OLAP processing times can vary from minutes to hours depending on type and volume of data being analyzed. To updates on OLAP database, you periodically process data in large batches.

OLTP, we measure OLTP processing times in milliseconds or le OLTP databases manage database updates in real-time.

Example difference: OLAP vs OLTP

let's us consider a large retail company that operates hundreds of stores across the country. The company has a massive ~~so~~ database.

The company uses OLTP to process transactions in real time, update inventory levels and manage customer accounts.

In addition, company uses OLAP to analyze data collecte by OLTP. They perform complex queries on large volumes of historical data to identify patterns and trends.

Difference between Database & Datawarehouse

↳ A database is any collection of data organized for storage, accessibility, and retrieval.

A data warehouse is a type of database that integrates copies of transaction data from disparate source systems

Database	Datawarehouse
i) Focused on transactional processing databases are optimised for rapid and frequent data retrieval.	i) Primarily focused for analytical processing, Data warehouses handle complex queries.
ii) Emphaises real-time data access and transactional processing.	ii) Optimised for query performan and analytical processing.
iii) Structured in tables with predefined schemas.	iii) organized around specific business subjects.
iv) Stores current and transactional data.	iv) stores historical data, allow for analysing trends and chang over time.
v) It adheres to ACID properties to guarantee reliability of transactions.	v) Data-warehouses ensure dat consistency, the may not strictly adhere to ACID properties.