

Data Warehouse vs. Data Lake

Feature	Data Warehouse	Data Lake
Definition	A centralized repository for structured, processed data optimized for analytics	A storage system that holds raw, structured, semi-structured, and unstructured data
Data Type	Structured and processed	Raw, structured, semi-structured, and unstructured
Storage Cost	Higher due to structured nature	Lower because it stores raw data
Processing	Schema-on-write (data is structured before storage)	Schema-on-read (data is structured when needed)
Performance	Optimized for fast analytical queries	Slower queries due to raw data processing
Use Case	Business intelligence (BI), reporting, dashboards	Big data, machine learning, real-time analytics
Technology Examples	Amazon Redshift, Snowflake, Google BigQuery	Amazon S3, Azure Data Lake, Hadoop

Recommendation for SME Client

- If the SME focuses on **reporting, BI, and structured analytics**, a **Data Warehouse** is a better choice due to its optimized performance.
- If the SME works with **large-scale unstructured data, machine learning, or requires flexibility**, a **Data Lake** is a better choice.
- For a balanced approach, they can use a **hybrid model** (e.g., a data lake for raw storage and a warehouse for processed data).

OLAP vs. OLTP

Feature	OLAP (Online Analytical Processing)	OLTP (Online Transaction Processing)
Purpose	Data analysis and business intelligence	Transactional operations (e.g., CRUD - Create, Read, Update, Delete)
Data Type	Historical, aggregated data	Real-time, operational data
Performance	Optimized for complex queries	Optimized for fast transactions
Storage	Stores large datasets	Stores current operational data
Use Case	Reporting, dashboards, trends analysis	Order processing, customer transactions, banking
Technology Examples	Microsoft Analysis Services, Amazon Redshift, Google BigQuery	MySQL, PostgreSQL, Microsoft SQL Server

Recommendation for SME Client

- If the SME needs to **analyze business trends, generate reports, and make strategic decisions**, **OLAP** is recommended.
- If the SME operates with **day-to-day transactions (e.g., sales, inventory management, customer orders)**, **OLTP** is required.
- A combination of both is often necessary: OLTP for operational transactions and OLAP for analytics based on OLTP data.