OLTP and OLAP: a practical comparison

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OLTP and OLAP: The two terms look similar but refer to different kinds of systems. Online transaction processing (OLTP) captures, stores, and processes data from transactions in real time. Online analytical processing (OLAP) uses complex queries to analyze aggregated historical data from OLTP systems.

What is OLTP?

An OLTP system captures and maintains transaction data in a database. Each transaction involves individual database records made up of multiple fields or columns. Examples include banking and credit card activity or retail checkout scanning.

In OLTP, the emphasis is on fast processing, because OLTP databases are read, written, and updated frequently. If a transaction fails, built-in system logic ensures data integrity.

What is OLAP?

OLAP applies complex queries to large amounts of historical data, aggregated from OLTP databases and other sources, for data mining, analytics, and business intelligence projects. In OLAP, the emphasis is on response time to these complex queries. Each query involves one or more columns of data aggregated from many rows. Examples include year-over-year financial performance or marketing lead generation trends. OLAP databases and data warehouses give analysts and decision-makers the ability to use custom reporting tools to turn data into information. Query failure in OLAP does not interrupt or delay transaction processing for customers, but it can delay or impact the accuracy of business intelligence insights.

ETL: the force that joins OLTP and OLAP

The data from one or more OLTP databases is ingested into OLAP systems through a process called extract, transform, load (ETL). With an ETL tool, users can collect data from several sources and send it to a destination, such as an OLAP data warehouse, where it is queried by analytics and business intelligence tools for insights.

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OLTP vs. OLAP: side-by-side comparison

OLTP is operational, while OLAP is informational. A glance at the key features of both kinds of processing illustrates their fundamental differences, and how they work together.

	OLTP	OLAP
Characteristics	Handles a large number of small transactions	Handles large volumes of data with complex queries
Query types	Simple standardized queries	Complex queries
Operations	Based on INSERT, UPDATE, DELETE commands	Based on SELECT commands to aggregate data for reporting
Response time	Milliseconds	Seconds, minutes, or hours depending on the amount of data to process
Design	Industry-specific, such as retail, manufacturing, or banking	Subject-specific, such as sales, inventory, or marketing
Source	Transactions	Aggregated data from transactions
Purpose	Control and run essential business operations in real time	Plan, solve problems, support decisions, discover hidden insights
Data updates	Short, fast updates initiated by user	Data periodically refreshed with scheduled, long-running batch jobs
Space requirements	Generally small if historical data is archived	Generally large due to aggregating large datasets
Backup and recovery	Regular backups required to ensure business continuity and meet legal and governance requirements	Lost data can be reloaded from OLTP database as needed in lieu of regular backups
Productivity	Increases productivity of end users	Increases productivity of business managers, data analysts, and executives
Data view	Lists day-to-day business transactions	Multi-dimensional view of enterprise data
User examples	Customer-facing personnel, clerks, online shoppers	Knowledge workers such as data analysts, business analysts, and executives
Database design	Normalized databases for efficiency	Denormalized databases for analysis

OLTP provides an immediate record of current business activity, while OLAP generates and validates insights from that data as it's compiled over time. That historical perspective empowers accurate forecasting, but as with all business intelligence, the insights generated with OLAP are only as good as the data pipeline from which they emanate.

Stitch optimizes the data pipeline

To get actionable intelligence from OLTP data, it must be extracted, transformed, and loaded into a data warehouse for analysis. While this can be done with in-house programming resources, data ingestion is more effectively handled with an ETL tool. ETL tools remove the need for constant code maintenance due to changing data source APIs, reporting requirements, and business needs. An ETL tool like Stitch optimizes OLTP data ingestion, freeing up time and IT staff to focus on more value-added activities.

Simplify the process of pulling OLTP source data into your warehouse for OLAP. Choose a solution that scales with your data and provides the support you need to stay ahead of changes and on track for insights.

Stitch is designed to make the process of populating your data warehouse simple and easy. Try Stitch today to close the gap between OLTP and OLAP. It's free to try and setup takes minutes.