Vinoothna Bavireddy

OLTP Vs OLAP

IT Systems are divided into two : OLTP (On-line Transaction Processing) and OLAP (On-line Analytical Processing).

What is OLTP?
Online transaction processing (OLTP) captures, stores, and processes data from transactions in real time. The data in an OLTP database is often modified using Insert, update or delete functions. The main emphasis for OLTP systems is the speed of query processing ability whilst maintaining data integrity in multi-access environments and is measured in terms of number of transactions per second. In OLTP database the data is real time data stored in the form of Third normal form (3NF) entity model.
Example: database of a hospital where patient data is updated with new information.

What is OLAP?
Online analytical processing (OLAP) uses complex queries involving aggregations to analyze retrospective data that is retrieved from OLTP systems.Unlike OLTP systems OLAP is measured in terms of response time rather than number of transactions per second. Data Mining techniques frequently use OLAP systems to derive meaningful insights from data that is captured by the OLTP system. In the OLAP database the data is stored in the form of multi-dimensional schemas known as star schema.
Example: Analyzing market trends to identify potential changes to the market and to stay ahead of their competitors.

	OLTP	OLAP
Characteristics	Capable of handling large number of transactions	Not measured in terms of number of transactions as the number of transactions are less but it is capable of handling large volumes of data.
Query types	Simple standard queries	Complex queries
Operations	Commands include UPDATE, INSERT, DELETE.	SELECT statements and aggregate functions
Response time	Milliseconds	Time depends on amount of data- could take seconds, minutes or hours depending on the size.

Vinoothna Bavireddy

Design	Specific to the industry that is healthcare, banking, automobile	Specific to the subject that is sales, inventory, marketing
Source	Real Time transactions	Aggregating data from OLTP Databases
Purpose	To control and run day to day business operations	To make informed decisions from the data captured through OLTP.
Data Updates	Continuously changing so short and fast updates	Updates are periodical based on requirement.
Space Requirements	Small if historical data is archived	Large, since data is aggregated.
Backup and recovery	Require regular backup to prevent loss	Data can be recovered from OLTP if required.
Productivity	Increases productivity of end users	Increases productivity of data analysts and executives
Data View	Day to day business	Multi-dimensional view of the business
User example	Customer facing	Knowledge workers such as data analysts, business analysts and executives.
Database Design	Normalized databases for efficiency	Denormalized for analysis

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