

# Database comparison checklist

In this lesson, you have been learning about the different aspects of databases and how they influence the way a business intelligence system functions. The database framework—including how platforms are organized and how data is stored and processed—affects how data is used. Therefore, understanding different technologies helps you make more informed decisions about the BI tools and processes you create. This reading provides a breakdown of databases including OLAP, OLTP, row-based, columnar, distributed, single-homed, separated storage and compute, and combined.

## OLAP versus OLTP

Database technology	Description	Use
OLAP	Online Analytical Processing (OLAP) systems are databases that have been primarily optimized for analysis.	<ul style="list-style-type: none"><li>• Provide user access to data from a variety of source systems</li><li>• Used by BI and other data professionals to support decision-making processes</li><li>• Analyze data from multiple databases</li><li>• Draw actionable insights from data delivered to reporting tables</li></ul>
OLTP	Online Transaction Processing (OLTP) systems are databases that have been optimized for data processing instead of analysis.	<ul style="list-style-type: none"><li>• Store transaction data</li><li>• Used by customer-facing employees or customer self-service applications</li><li>• Read, write, and update single rows of data</li><li>• Act as source systems that data pipelines can be pulled from for analysis</li></ul>

## Row-based versus columnar

Database technology	Description	Use
Row-based	Row-based databases are organized by rows.	<ul style="list-style-type: none"><li>• Traditional, easy to write database organization typically used in OLTP systems</li><li>• Writes data very quickly</li><li>• Stores all of a row's values together</li><li>• Easily optimized with indexing</li></ul>
Columnar	Columnar databases are organized by columns instead of rows.	<ul style="list-style-type: none"><li>• Newer form of database organization, typically used to support OLAP systems</li><li>• Read data more quickly and only pull the necessary data for analysis</li><li>• Stores multiple row's columns together</li></ul>

## Distributed versus single-homed

Database technology	Description	Use
Distributed	Distributed databases are collections of data systems distributed across multiple physical locations.	<ul style="list-style-type: none"><li>• Easily expanded to address increasing or larger scale business needs</li><li>• Accessed from different networks</li><li>• Easier to secure than a single-homed database system</li></ul>
Single-homed	Single-homed databases are databases where all of the data is stored in the same physical location.	<ul style="list-style-type: none"><li>• Data stored in a single location is easier to access and coordinate cross-team</li><li>• Cuts down on data redundancy</li><li>• Cheaper to maintain than larger, more complex systems</li></ul>

## Separated storage and compute versus combined

Database technology	Description	Use
Separated storage and compute	Separated storage and computing systems are databases where less relevant data is stored remotely, and relevant data is stored locally for analysis.	<ul style="list-style-type: none"><li>• Run analytical queries more efficiently because the system only needs to process the most relevant data</li><li>• Scale computation resources and storage systems separately based on your organization's custom needs</li></ul>
Combined storage and compute	Combined systems are database systems that store and analyze data in the same place.	<ul style="list-style-type: none"><li>• Traditional setup that allows users to access all possible data at once</li><li>• Storage and computation resources are linked, so resource management is straightforward</li></ul>