Name: Keziah Christine M. Caga-anan

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Activity

**Types of Database**

**Relational**[**Database**](https://searchdatamanagement.techtarget.com/definition/database)

A relational database is a type of database that stores and provides access to data points that are related to one another. Relational [databases](https://www.oracle.com/database/what-is-database/) are based on the relational model, an intuitive, straightforward way of representing data in tables. In a relational database, each row in the table is a record with a unique ID called the key. The columns of the table hold attributes of the data, and each record usually has a value for each attribute, making it easy to establish the relationships among data points.

**Analytical (OLAP) Online Analytical Processing**

Online analytical processing (OLAP) is a technology that organizes large business databases and supports complex analysis. It can be used to perform complex analytical queries without negatively affecting transactional systems. The databases that a business uses to store all its transactions and records are called [online transaction processing (OLTP)](https://docs.microsoft.com/en-us/azure/architecture/data-guide/relational-data/online-transaction-processing) databases. These databases usually have records that are entered one at a time. Often, they contain a great deal of information that is valuable to the organization. The databases that are used for OLTP, however, were not designed for analysis. Therefore, retrieving answers from these databases is costly in terms of time and effort. OLAP systems were designed to help extract this business intelligence information from the data in a highly performant way. This is because OLAP databases are optimized for heavy read, low write workloads.

**The key-value database**

A key-value database is a type of nonrelational database that uses a simple key-value method to store data. A key-value database stores data as a collection of key-value pairs in which a key serve as a unique identifier. Both keys and values can be anything, ranging from simple objects to complex compound objects. Key-value databases are highly partitionable and allow horizontal scaling at scales that other types of databases cannot achieve. For example, [Amazon DynamoDB](https://aws.amazon.com/dynamodb/) allocates additional partitions to a table if an existing partition fills to capacity and more storage space is required.

**Column Family**

A column family is a database object that contains columns of related data. It is a [tuple](https://en.wikipedia.org/wiki/Tuple) or pair that consists of a [key–value pair](https://en.wikipedia.org/wiki/Attribute%E2%80%93value_pair), where the key is mapped to a value that is a set of columns. In analogy with relational databases, a column family is as a "table", each key-value pair being a "row". Each column is a [tuple](https://en.wikipedia.org/wiki/Tuple) ([triplet](https://en.wikipedia.org/wiki/Triplet_(disambiguation))) consisting of a column name, a value, and a [timestamp](https://en.wikipedia.org/wiki/Timestamp). In a [relational](https://en.wikipedia.org/wiki/Relational_database) [database table](https://en.wikipedia.org/wiki/Database_table), this data would be grouped together within a table with other non-related data. There are two types of column families exist, [Standard column family](https://en.wikipedia.org/wiki/Standard_column_family): contains only columns, [Super column family](https://en.wikipedia.org/wiki/Super_column_family): contains a map of [super columns](https://en.wikipedia.org/wiki/Super_column).

**Graph database**

A graph database (GDB) is a database that uses graph structures for semantic queries with nodes, edges, and properties to represent and store data. A key concept of the system is the graph (or edge or relationship). The graph relates the data items in the store to a collection of nodes and edges, the edges representing the relationships between the nodes. The relationships allow data in the store to be linked together directly and, in many cases, retrieved with one operation. Graph databases hold the relationships between data as a priority. Querying relationships is fast because they are perpetually stored in the database. Relationships can be intuitively visualized using graph databases, making them useful for heavily inter-connected data.

**Document database**

A document database is a type of nonrelational database that is designed to store and query data as JSON-like documents. Document databases make it easier for developers to store and query data in a database by using the same document-model format they use in their application code. The flexible, semi structured, and hierarchical nature of documents and document databases allows them to evolve with applications’ needs. The document model works well with use cases such as catalogs, user profiles, and content management systems where each document is unique and evolves over time. Document databases enable flexible indexing, powerful ad hoc queries, and analytics over collections of documents.