NoSQL

NoSQL databases are database that store data in forms other than relational tables.

Why the need for NoSql databases?

With the rise of the internet, the demand for data storage grew exponentially. Relational database techniques struggled to cope with the increased volume of data that needed to be stored. A well-designed relational database will feature many normalized tables. When querying the database many joins are required to extract meaning from the normalized tables. Each join requires a new 'index look up' and this makes querying relational databases with large sets and many joins time-consuming. NoSQL databases are often better suited at handling larger scales of data.

So far there are 4 main types of NoSQL databases

Key-value pairs

Column orientated databases

Document databases

Graph databases

Key-Value pair databases closely resemble hash maps, with each value having a unique key.

Key-value databases offer fast performance but lack the ability to query based on value contents.

Document databases store entire documents as a single value of a key-value pair.

While in a relational database data for a specific entity would be spread across records in multiple tables, in a document database all information is stored together as a 'document'(Bigdataanalyticsnews,2014). Document databases allow users to query based on the content of a document. Document databases however have poor performance for querying based on relationships between documents.

Graph databases

Graph focus on the relationships between entities in a database.

Graph databases store data in a node graph while relational databases store data in tables and 'joins'.

In graph databases, the relationships between entities are first-class citizens and can be stored. In a relational database, the relation is only described in the query themselves (Ontotext,2020).

Relational databases require a schema to have been created before data can be inserted.

With a graph database, it is easy to insert new types of data into a database without requiring any schema updates.

Neo4j

Neo4j is one of the world's leading graph databases. Neo4j has been adopted by banks, governments and businesses. eBay found that the adoption of Neo4J's graph databases allowed for query performance increases of a thousand-time multiplier (Neo4j, 2016).

Neo4j and other graph databases make it easier to extract data about the relations of entities. Neo4j provides its own language for queries that is similar SQL but tailored for graph databases. Graph databases can be more intuitive understand and can more closely resemble business design documentation.

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Ontotext. (2020) What is a NoSQL Graph Database?. Available from:https://www.ontotext.com/knowledgehub/fundamentals/nosql-graph-database/

Neo4j. (March, 2016) Intro to Graph Databases Episode #1 - Evolution of DBs?. Available from: https://www.youtube.com/watch?v=5Tl8WcaqZoc