# Postgre SQL vs. MongoDB

In software development there are two different ways to store data in a database. You can choose to go the traditional route with a relational database system or you can go the more modern route with a NoSQL database. In this paper, I will be outlining the advantages and disadvantages of using a relationship database system with Postgre SQL versus a NoSQL database with MongoDB.

The first major difference of the two is the structure in the databases. Postgre SQL is a relational database and therefore is more structured. With a relational database your data is built with predefined schemas. This can be restrictive because your data structures must be predefined before you start your database. These databases can support complex data but it can be really challenging to restructure your data in a relational database.

With MongoDB, a NoSQL database, the data is has dynamic schemas for unstructured data. This makes these types of databases extremely flexible since you don’t have to define your schemas up front. It also allows each document to have its own structure. You can also add fields as you go which is another reason why it is very flexible.

The second big difference in NoSQL versus Postgre SQL is the scalability of the database. There are 2 ways to scale a database, horizontally and vertically. With horizontal scaling, you can add more fields and add to the datasets. With vertical scaling you can add more rows of data. With a SQL database, like Postgre SQL you can scale faster vertically because the schemas provides structure and ease of scaling with the data. With NoSQL, like MongoDB, you can scale horizontally. This means you can add to your data sets because there are no set schemas and there is more flexibility overall.

The other difference between the two types of databases is the query speed for the database types. The query speed of the databases is going to depend on the type of query you are running. If you are running a large query, a SQL database like Postgre SQL will be faster and more efficient. If you’re running a simple query, NoSQL with MongoDB will be a much faster query.

Another difference between the two types of databases is that with NoSQL and with MongoDB, specifically is that with MongoDB data goes in the same way it comes out, there is symmetry in the data. Even without a schema there is symmetry in the way the data comes out of a system.

MongoDB also exploits features of contemporary languages unlike SQL databases. It makes it easier to use with newer and more modern implementations and allows you to use unstructured data such as documents, images and webpages.

With data in a relational database management system, the data is stored in a rectangle while in a NoSQL database such as MongoDB, you are looking at data created in maps and lists. With a map and list structure there is no compile time dependency. You also don’t have to worry about constantly recording and deploying your data.

With MongoDB there are also 2 ways to store data. You can store it in a nested property through joins, which would be for a hierarchical structure for your data. You can also store it in reference documents which is where you really gain the benefits of the flexibility with MongoDB.

When you’re looking at writing a database, it might appear that a NoSQL is more advantageous than using a relational database system. While this is going to be true some of the time, there are times where you would want to use Postgre SQL.

Consider a search engine. A search engine needs to process mass amounts of data across millions of pages and documents. When you think about the speed needed for a search engine, a relational database management system might seem like it has the biggest advantage. You would want to consider the fact that there will be millions of documents and unstructured data. You will also want to consider that as pages and documents are written you would want flexibility in the database. For these reasons, a NoSQL database is going to be advantageous.

One example of where you might use a relational management database would be in a library. You know the elements of a book that you would want to index and they aren’t going to change. Using Postgre SQL, you could have a very fast and efficient database. It would also be very straightforward which is what you want out of a library database.

In conclusion, both Postgre SQL and MongoDB have their advantages and disadvantages when considering them for use in building your database. You’ll want to carefully consider your needs with scalability, speed and flexibility when you choose the right database for your project.