Unit 8

Hands-on with Database Design

Discussion Forum – Alternatives to SQL

(Responses)

THREAD 1

From: Sergio Rafael Zavarce Caldera

Hi Michael,

Very interesting set of data about database technologies. In my opinion, both NoSQL and relational databases are getting a boost from cloud providers since they are implementing several database options, some open-source and even creating their own. It could be argued that many of the differences between speed and storage capacity could shrink in the next years through the elastic and scalable capabilities of cloud providers. On the other hand, software migration and contract costs associated with changing from one database provider such as Oracle might discourage big companies from using NoSQL technologies. Do you think that this scenario could change in favor of NoSQL technologies? What are your thoughts on this?

From: Michael Justus

Hi Sergio,

I really enjoyed your response regarding cloud providers providing a boost to both relational and NoSQL databases, because your statement is very much true, especially with regard to the database offerings of Azure and CosmosDB (a NoSQL database) and HBase and their ability to leverage integration APIs for Cassandra, MongoDB and Gremlin as though CosmosDB were Cassandra or MongoDB (Microsoft, 2021).

The statement "software migration and contract costs ... might discourage big companies from using NoSQL technologies" is interesting because NoSQL databases are generally open-source (Leavitt, 2010), which implies zero cost to

organisations. Though, clients may end up paying for support calls, that involve using outsourced entities or contractors. The cost then of NoSQL databases lie not in the licensing of the products, but more in the skills, hardware and support required to run such NoSQL databases.

To answer your question, NoSQL databases meet a particular need and data structures. I do not think they will replace relational databases any time soon since relational is a mature, stable technology, with well-supported tools and reliability. In contrast, NoSQL databases do not natively support ACID transactions, have limited customer support tools and there is a general unfamiliarity with NoSQL (Leavitt, 2010).

References

Leavitt, N. (2010) Will NoSQL databases live up to their promise?. *Computer*, *43*(2):12-14. DOI: **10.1109/MC.2010.58**

Microsoft, (2021) Types of databases on Azure. Available from https://azure.microsoft.com/en-us/product-categories/databases/ [Accessed on 1 Jul. 2021]

Microsoft, (2021) Welcome to Azure Cosmos DB. Available from https://docs.microsoft.com/en-us/azure/cosmos-db/introduction [Accessed on 1 Jul. 2021]

From: Sergio Rafael Zavarce Caldera

Before researching this topic I used to believe the same. Why would anyone keep paying high fees for Oracle´s services when there are so many options out there? And that is correct for start-ups or small companies with low database impact. But for those who have been using Oracle for a long time, the story is different.

Many companies are trapped in Oracle's net because of the contractual lock-in strategies, which can cost a fortune to get rid of. Moreover, for those companies is not only about the Databases. They usually have CRM, ERP, HR amongst other solutions that would need migration. On top of that, there is always the cost associated with software migration or database development to implement the new database system (Guarente, 2020).

References:
Guarente, C. (November 30, 2020). Is Oracle Still
Relevant?. *Palisade.* https://palisadecompliance.com/is-oracle-still-relevant/
[Accessed 10 July 2021]

From: Kieron Holmes

Hi Sergio,

I completely agree with your point regarding contractual lock-ins and legacy/other systems that would require migration, as this is something I'm constantly aware of in my day-to-day role.

I work for a small Local Authority, which, over the years, have purchased specialised software packages which are reliant on proprietary closed-source database systems such as Oracle and Actian Ingres. Unfortunately, in cases like this, it's far cheaper to work with the system in its current state (Using those technologies) than requesting a rewrite, which would likely total in the hundreds of thousands for some packages, although everyone in the development team would be keen for this to happen!

THREAD TWO

From: Kieron Holmes

Hi Michael,

I find your post very interesting, particularly the comparisons across NoSQL technologies. I have picked up on one quote regarding the lack of standardisation across different NoSQL variants.

"Moreover, there exists no single query language for NoSQL databases."

I find it quite interesting that there is little standardisation across the various NoSQL technologies, requiring an individual to specialise in a general product instead of the easily transferrable knowledge with standard SQL databases. A 2019 article produced by ScaleGrid shows that traditional SQL accounted for 60.48% of database usage, whilst NoSQL accounted for 39.52%.

The lack of language standardisation could lead to a skills shortage for particular NoSQL technologies. Do you believe that this is impacting the overall take-up of NoSQL within businesses? If standardisation was achieved, could you see NoSQL becoming the go-to database technology?

References:

Scalegrid. (2019) 2019 Database Trends – SQL vs. NoSQL, Top Databases, Single vs. Multiple Database Use. Available From: https://scalegrid.io/blog/2019-database-trends-sql-vs-nosql-top-databases-single-vs-multiple-database-use/ [Accessed 7th July 2021].

THREAD THREE

From: Beran Necat

Hi all,

A very interesting postings - in which you all consider various aspects of both SQL and NoSQL.

Just to add to the interesting discusion SQL databases,based on the relational data model, do not scale easily to handle lage growing quantities of both structured and unstructured data. There is, therefore, a need for alternative storage models for data.

The big data concept has always been with us in terms of volume,variety and value or combination of any of these.For the data to be of use it must be analysed for a whole new range of techniques including machine learning, natural language processing, predictive modelling etc..Think about 'SQL'. What would our data models be like if this was the case ?