

ARTICLE TOPIC:

“Relational .vs. NoSQL Databases”

Abstract:

NoSQL Database has become a well-known database as the web 3.0 has arrived. It facilitates and deals with large amount of data providing quick access time, high scalability and availability to the distributed systems. It has also overcome many challenges like Security issues, etc. The concepts, types and security issues are summarized briefly in this particular content.

Introduction:

As the Relational Database (RDB) is facing a lot more challenges and it has become difficult for it to overcome the circumstances which had occurred soon after the popularity of web 2.0 and now web 3.0. So the companies have taken a look at the next-step Database system i.e. NoSQL Database, which is more sufficient and reliable when dealing with a large amount of data, thus, reducing the chance of vulnerabilities within the database management paradigm. The term NoSQL was introduced by Carlo Strozzi in the year 1998 releasing more than 150 products till date.

NoSQL Database is categorized in two flavors i.e. ACID and BASE. ACID refers to “Atomicity, Consistency, Isolation, Durability”, whereas BASE refers to “Basically Available, Soft state, Eventual consistency”. ACID and BASE are contrary to one another as ACID puts light on the

properties of NoSQL Database, and BASE mainly focuses on its permanent availability.

Relational .vs. NoSQL Databases:

- **Transaction Reliability:**

As the Relational Databases support ACID, they are more reliable in transaction as compared to NoSQL Databases.

- **Data Model:**

Relational Databases are described as “n-ary” mathematical relations whereas NoSQL Database carries techniques i.e. graph, document data, etc. They can also deal with unstructured data.

- **Scalability:**

Relational Databases support vertical scalability and on the other end NoSQL holds up horizontal scalability.

- **Cloud:**

Relational Databases do not assist perfect content data search and are not much reliable for cloud based environment. The NoSQL Databases are perfect and best for cloud platform.

- **Big Data Handling:**

The Relational Databases cannot handle the big data efficiently but the NoSQL Databases can do so, as they are developed to manipulate big data.

- **Data Warehouse:**

Data warehousing tends to increase the amount of data, and as the data increases, it is difficult for Relational Databases to handle them properly as compared to NoSQL Databases that have a motive to handle the big data.

- **Complexity:**

NoSQL Databases are reliable in this case because they can store and retrieve all kinds of data whether structured, unstructured or semi-structured, on the other hand, Data complexity is a problematic circumstance for Relational Databases.

- **Crash Recovery:**

Relational Databases carry out crash recovery through recovery manager (ARIES algorithm and log files) whereas NoSQL Databases do this by replicating backups.

- **Security:**

Having a good security mechanism however, the Relational Databases experience threads such as, Cross Site Scripting, Weak communication protocols, etc. and as the NoSQL Databases support big data, its security is effected. These issues are being resolved as the new NoSQL products are releasing.

Conclusion:

NoSQL Databases are unlike to the Relational Databases in many aspects. The main issue that NoSQL Databases face is the security issue as they center on the big data manipulation and storage. It's a hope that the NoSQL Databases will soon get rid of these security vulnerabilities as they will grow and improve as time goes on.