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M9A1 – Neo4J and Cypher

There are many kinds of database management systems and each one is created for different purposes. While the most popular of database management systems are usually relational databases, which store data in tables, there are many different types. This report will be focused on the Neo4J database management system, as well as its query language, Cypher. Neo4J takes a different approach on managing data, but there is a reason it has become so popular for managing complex data.

The first thing to learn about is how Neo4J stores its data. Since Neo4J is a graph database, how it stores data is straightforward: in graphs. There are two elements to a graph database: nodes, also known as vertices, and relationships, also known as edges. In these graphs, the nodes depict entities, while the relationships depict the association of the nodes. Together, they form a graph that allows users to depict the data in forms of many different graphs, such as a bar graph.

When it comes to the reasoning behind using a graph database, the answer is quite simple. When it comes to the ever-popular relational database, highly structured data is stored alongside several records, but the relationships between the data are not stored. Given that the relationships between different data points are usually more valuable than the data itself, graph databases store relationships and connections as first-class entities. This can result in a less complex, easier to understand and read model.

As for Neo4J’s role in managing graph databases, there are many advantages it provides over other management systems. Neo4J does not require any complex joins in order to retrieve data. This makes it both easier and faster to retrieve data when using Neo4J over other systems. The data model provides by the database is also very handy: it is simple, yet flexible and powerful. Users can change the model depending on their application or industry. Neo4J also provides a built-in web application that allows users to create and query their graph data. Neo4J is also ACID compliant, has reliable scalability, supports indexing, and works with many different languages. Neo4J also uses Cypher as its querying language, which is a simple yet powerful language for querying graph databases.

Cypher Query Language is, essentially, SQL for graphs. Cypher was directly inspired by SQL and aims to let the user focus on the data they want out of the graph and spend less time trying to obtain it. Due to how similar it is to other languages; it is one of the easiest graph languages to learn. Cypher’s syntax is English like, as well as making use of ASCII-pseudo art, making it very easy to read. Like other querying languages, Cypher allows users to perform CRUD operations on databases, enabling them to maintain their database as needed. With how Cypher’s syntax works, even very complex queries can be concise and intuitively written; a query that may require an SQL user to write multiple JOIN statements and subqueries might only require a simple pseudo-English sentence query in Cypher. This not only makes learning the querying language easier, it also allows experienced users to spend less time writing queries and more time analyzing data.

Overall, Neo4J is one of the leading graph database management systems, and for good reason. On top of providing many useful things that other DBMSs do, Neo4J takes things a step further and gives users new tools that make data management even easier, all while being open source. Whether it be its impressive scalability, its handy data model, or its powerful querying language, Cypher, there are many reasons those looking for a graph database management system would choose Neo4J.

Works Cited

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