

Real-Time Recommendation Engines for a Connected World – Data Sheet

WHO NEEDS RECOMMENDATION ENGINES?

- Consumer web companies, the majority of whose revenue comes from their online channels
- Companies that are investing heavily in their online channels to compete with consumer web companies (including those in retail, financial services, media and broadcasting and logistics)

Recommendation and Personalization Engines at the Core of Digital Transformation

Recommendation engines have played a huge part in transforming the consumer web – social recommendations (“People you may know”), product recommendations (“Other people bought”) and content personalization (“You may also like”) – have shaped the way we find friends, choose what products to buy or find new music, movies and other content.

Today, recommendation engines are at the core of digitization across industries. Companies like **eBay** rely on Neo4j for routing recommendations; **Walmart** is just one example of top retailers that use Neo4j for real-time product recommendations and promotions; **Fortune 100** financial institutions have also built recommendations engines to improve efficiency and modernize asset management on the trading floor; and major international hotel chains have built advanced, automated and real-time dynamic pricing engines on top of Neo4j.

Graph Databases as the Go-To Technology for Recommendations

Creating relevant and accurate recommendations is a non-trivial task, and it requires the ability to incorporate and connect data from many different sources (e.g., product, customer, inventory, supplier, logistics and social sentiment data). Neo4j is specifically designed to store and process such data relationships.

Furthermore, this data must be processed both by tracking historical patterns as well as monitoring a user’s current visit or session, something that cannot be achieved with batch processing. Because of its native graph storage, Neo4j thrives in querying such complexity at scale, easily outperforming relational (RDBMS) and other NoSQL data stores.

Key Value Gains when Switching to Graph-Based Recommendations



Value Propositions

- **Increase Revenue**
Recommendations done right have direct impact on revenues.
- **Create Higher Engagement**
Improved personalization and content recommendations lead to higher engagement.
- **Mitigate Risk**
Recommendation-based tools are foundational in modern fraud detection and asset management.



Benefits With Graphs

- **Real-Time Capabilities**
No database technology handles complex queries as efficiently and as fast as a native graph database.
- **Use Most Recent Transaction Data**
Neo4j doesn’t have to resort to batch processing when querying real-time transaction data.
- **Flexibility**
Neo4j easily ingests and processes connections from multiple data sources, solving problems with data stored in disparate silos.

Real-Time Recommendation Engines for a Connected World – Data Sheet

KEY NEO4J FEATURES

KEY BENEFITS

Minutes-to-milliseconds performance, data integrity, flexibility of model, developer productivity and hardware efficiency.

KEY FEATURES

Native graph storage and query processing, ACID compliance, causal consistency, enterprise-grade security, clustering and drivers for popular languages and platforms.

DEPLOYMENT FEATURES

On-premise, cloud and containers.

Did you know?
4 of the top 10 retailers worldwide use Neo4j

Penalties When Building Recommendation Engines Without a Graph Database

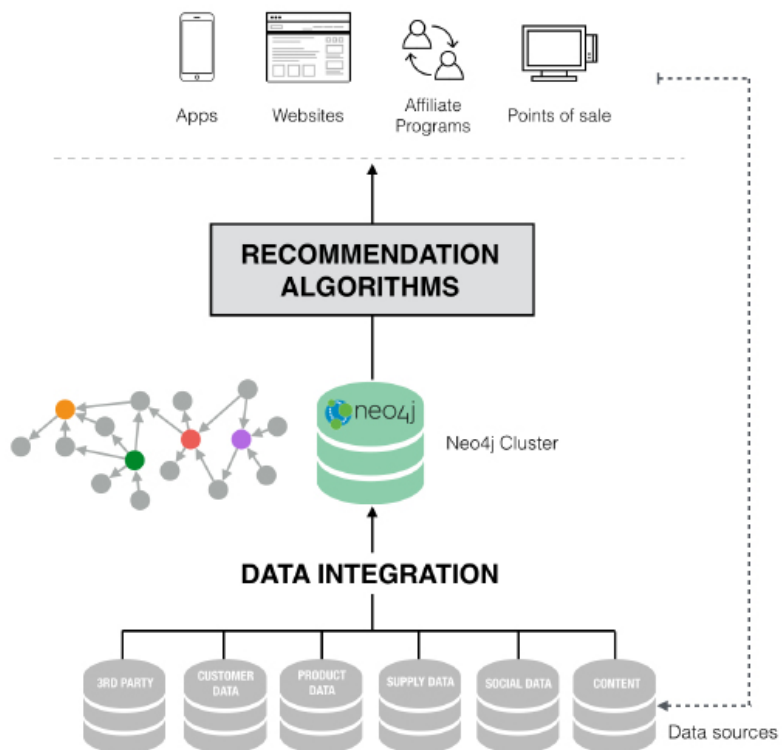
Without a graph database, recommendation engines have one or more of these problems:

- They resort to batch processing to pre-compute recommendations to make them available in real-time
- They traverse no more than three levels of depth to deliver real-time performance
- They can't flexibly accommodate new data sources

Building Recommendation Engines with Neo4j

Neo4j is a highly scalable, native graph database that delivers real-time insights into data relationships. Neo4j naturally stores, manages, and analyzes data within the context of connections. With Neo4j, you can continually improve recommendations of all types by accommodating new data sources and types — without a rewrite of your data model.

Built-in high availability features ensure user data is always available to your mission-critical recommendation engine. Data is integrated into a Neo4j cluster, and then modeled and queried based on its connections, laying the foundation for crafting advanced recommendation algorithms that power the next generation of application and services.



Example of how a graph database could be incorporated into an existing architecture, integrating data from several different sources.

Real-Time Recommendation Engines for a Connected World – Data Sheet

WHY NEO4J?

NATIVE GRAPH STORE

Unlike other database technologies, Neo4j is designed from the ground up to store and retrieve data and its connections. Relationships are first-class entities in a native graph database – making them easier to query and analyze.

FLEXIBLE SCHEMA

Neo4j's versatile property graph model makes it easier for organizations to evolve real-time recommendation engines as data types and sources change.

PERFORMANCE AND SCALABILITY

Neo4j's native graph processing engine supports high-performance graph queries on large user datasets to enable real-time decision making.

HIGH AVAILABILITY

The built-in, high-availability features of Neo4j ensure your user data is always available to your mission-critical recommendation engine.

What Companies Are Doing with Neo4j



"As the current market leader in graph databases, and with enterprise features for scalability and availability, Neo4j is the right choice to meet our demands."

— Marco Vada, Walmart

[Walmart](#) uses Neo4j to power real-time product recommendations. Walmart recognized the challenge it faced in delivering recommendations with traditional relational database technology and switched to Neo4j to enable the quick querying of customers' past purchases, as well as instantly capture any new interests shown in the customers' current online visit – essential for making real-time recommendations.

adidas

"We have many different silos, many different data domains, and in order to make sense out of our data, we needed to bring those together and make them useful for us."

— Sokratis Kartelias, adidas

[adidas](#), a global leader in the sporting goods industry, uses Neo4j to create a highly personalized experience that connects numerous internal data sources with information about user interests, local languages, regional sporting news and market-specific product offerings. With a vast global audience, the adidas Group significantly improved their ability to provide a more personalized experience to its online shoppers.



"Our Neo4j solution is literally thousands of times faster than the prior MySQL solution, with queries that require 10-100 times less code."

— Volker Pacher, eBay

With Neo4j, [eBay](#) managed to eliminate the biggest roadblock between retailers and online shoppers: the option to have your item delivered the same day. eBay chose Neo4j because of the schema-flexible nature of the database that allowed easy extensibility, speeding up development.



"On average, Neo4j processes over 90% of over 35 million daily transactions, each between three and 22 hops, in four milliseconds or less."

— Top Tier US Retailer

Neo4j is used to revolutionize and reinvent this top US retailer's real-time promotions engine. The company had suffered significant revenue loss due to legacy infrastructure, especially during peak transaction volume shopping dates like Thanksgiving and Cyber Monday. Thanks to the newly implemented Neo4j-based solution, they reached an all-time high in online revenues in 2016, and Neo4j also enabled this retailer to become one of the first in the US to provide the same promotions across both online and traditional retail channels.

Neo Technology is the creator of Neo4j, world's leading graph database. Neo4j is a highly scalable native graph database that leverages data relationships as first-class entities to help companies build intelligent applications that meet today's evolving connected data challenges including fraud detection, real-time recommendations, master data management, network security and IT operations.

Enterprises like Walmart, UBS, Cisco, HP, adidas and Lufthansa and hot startups like Medium, Musimap and Glowbl rely on Neo4j to harness the connections in their data.

Questions about Neo4j?

Contact us:

1-855-636-4532

info@neotechnology.com