

CASE STUDY



Top 10 Retail Company

Neo4j Transforms Performance of Global Retailer's Website after Cyber Monday Failings

INDUSTRY

Retail

USE CASE

Graph-Based Search and Recommendations

GOAL

Remove delays for online shoppers

CHALLENGE

Conventional database could not handle the real-time promotion calculations required at site checkout

SOLUTION

Install Neo4j-based front-end and back-end to speed up website operation

RESULTS

- Neo4j processes 90% of the retailer's 35 million-plus daily transactions in 4 milliseconds or less, comfortably above 20 millisecond target
- Q4 2016 digital sales rose 34% to a record high

When technical problems hit its online operations on Cyber Monday 2015, one retail giant turned to graph database vendor Neo4j. Now Neo4j-based systems process 90% of the company's 35 million-plus daily transactions at well above target speeds, helping it to achieve record digital sales.

The Company

The world's biggest retailers are still predominantly 'bricks-and-mortar' companies: like global leader Walmart, whose 11,000 stores [generate nearly \\$500 billion annual revenue](#). But as more shoppers go online rather than outdoors, all eyes are on Amazon.com, now the world's 8th largest retailer, whose sales are entirely online with not a single high-street store to its name. In response, all the retail giants are aggressively beefing up their digital operations. That includes one Top 10 US-based company, which turned to Neo4j after its burgeoning online operation was almost overwhelmed by the volume of customer traffic it attracted on that most critical sales day, Cyber Monday, 2015.

The Challenge

The company – which wishes to remain anonymous here, but is a Fortune Top 50 company – was running its site on the IBM WebSphere eCommerce platform, drawing data from an IBM DB2 relational database. On 30 November 2015, Cyber Monday, it offered an across-the-board 15% discount to site visitors. The result was something of a triumph: the company's executives were high-fiving each other once they saw they had pulled in more customers than any other bricks-and-mortar rival.

But the price paid was unacceptable. The site's checkout function kept working that day, but 90% of customer traffic was delayed. As one senior company executive said: "We pushed a lot of guests to the site and we were very successful in terms of volume. But the reality was we got significantly more traffic than we ever projected, and we couldn't handle it. We protected checkout so the site functioned. But we disappointed way too many guests, and that's never okay, period."

The biggest bottleneck was the crucial but complex promotions process, where a company invites shoppers to add last-minute extras to their online cart – a bit like placing tasty treats next to a supermarket checkout. But to flash up exactly the right recommendations requires software that can instantly analyse the shopper's cart contents and their buying history, and dig through 15-30 layers of data – such as promotion types, qualifying manufacturers, product names and categories – in real time.

This proved beyond a conventional relational database like DB2. So the retailer considered Neo4j, which is optimised to rapidly carry out such complex searches among masses of connected data.

The Solution

The company already knew its biggest rival, Walmart, had turned to Neo4j to provide the best web experience for its customers ([see case study here](#)). But this was no shoo-in. The importance of the decision to choose Neo4j is shown by the fact that over 50 of the company's executives were directly involved in its selection.

CASE STUDY



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– Matt Richards,
Neo4j

The retailer decided to invest close to \$700,000 on Neo4j software to revolutionise its online operations. Neo4j has reinforced key elements of the IBM e-commerce platform including the pricing engine, product promotions and recommendations, big data analytics and IT infrastructure.

As a result, in mid-2016 the company rolled out both a new Neo4j-based front-end and back-end to its website, enabling it to deal with growing consumer traffic. As its senior executive explained: “The new back-end allows us to scale to a much bigger volume level. Our business is much, much larger than it was three years ago, and we expect that growth to continue.”

Neo4j has transformed the company's real-time promotions engine and online cart promotion calculations. It also enabled the company to become one of the first retailers to provide the same promotions across both its online and traditional retail channels.

The Results

Neo4j now processes 90% of the retailer's 35 million-plus daily transactions – which involve between three and 22 hops across different layers of data – in 4 milliseconds or less, comfortably better than the 20 milliseconds target. And during Q4 2016, the vital Christmas retail period, the company's digital sales rose 34% to a record high, helped by the friction-free Neo4j solution.

Of course, as Cyber Monday 2016 approached there was concern about what might happen. But Neo4j literally saved the day. As Neo4j Account Executive Matt Richards said: “There was an enormous amount of fear around Cyber Monday, but we made sure they were successful. We really delivered on that.”

Matt added: “The biggest business pain they had was specifically around the promotions calculations of the cart, and we solved that for them. Every week there are 100s of promotions and these are now run using Neo4j. What Neo can do, that a relational database has trouble doing, is this number crunching.”

The future of retail is increasingly online, and Neo4j is helping this top 10 retailer thrive in the new era. “They've got to keep themselves relevant and Neo4j is a part of that vision to re-architect their business,” Matt said.

Neo4j is the leader in graph database technology. As the world's most widely deployed graph database, we help global brands – including [Comcast](#), [NASA](#), [UBS](#), and [Volvo Cars](#) – to reveal and predict how people, processes and systems are interrelated.

Using this relationships-first approach, applications built with Neo4j tackle connected data challenges such as [analytics and artificial intelligence](#), [fraud detection](#), [real-time recommendations](#), and [knowledge graphs](#). Find out more at [neo4j.com](#).

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