CASE STUDY

Innovator Cobrain finds the clothes you crave with Neo4j

cobrain

INDUSTRY
e-Commerce

CHALLENGE
– Offer buyers real-time, highly personalized product recommendations
– Launch the first cross-merchant and cross-product recommendation engine

SOLUTION
– Neo4j graph database, replacing previous graph database

RESULT
– Scale-up to support millions of consumers
– Massive performance gains, from seconds to milliseconds

There are over 40,000 sweaters sold online, so how do you find the exact one you want? The answer is: Cobrain, a new website, iOS and Android app, driven by graph database technology that can act as an online 'personal shopper' for millions of consumers.

Cobrain is the brainchild of serial entrepreneur Rob McGovern, who founded the company after selling his previous online job board venture CareerBuilder.com for $450 million.

The site, which is free for both buyers and merchants, works by storing all the clothing items sold by over 300 of the world's largest and best boutique merchants – everyone from Macy's to ModCloth. Then when a buyer comes to the site, Cobrain can instantly offer them the five items they'll love the most, in whatever category they want.

How does it do this? On their first visit, Cobrain briefly asks each person what they like (to train their 'Cobrain'). Then when they shop, Cobrain combines their preferences with the products loved by the other people most like them, to serve up its top-five recommendations or 'Craves'.
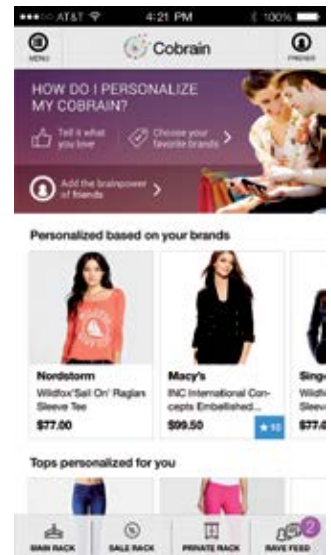
This ability to provide the best suggestions from among millions of products is based on understanding all the other consumers who are most like that particular shopper, and so unearthing the clothing that exactly matches their tastes. That requires technology that can make billions of calculations in milliseconds. That technology is the Neo4j graph database.

CHALLENGE
Cobrain started up in December 2013 in Bethesda, Maryland, and is the first company to take product recommendations to a new level – highly personalized offers, drawn from merchants right across an industry rather than just one retailer, delivered dynamically in real time.

"With Neo4j we saw a massive performance gain, we saw query times decrease by seconds in some cases."
– Andy Rosenbaum, Cobrain

This simple-sounding target was a major challenge, explained Cobrain's vice president of engineering and technology, Andy Rosenbaum: "The recommendation space is very challenging. It's very hard to come up with a really good personalized recommendation for somebody, just because information is so private – big retailers don't want to share it with each other, and individuals don't want to share it.

"So we saw a great opportunity to empower users. If we can create better recommendations, then it's a win for everybody. It's a win for the merchants because they get better products in front of the users which means they're more likely to buy; and it's a win for the consumer because they're not feeling like they're getting stuff thrown in front of them that they're not interested in."

Importantly, Cobrain only makes money when it make a successful recommendation, taking a small percentage of the ensuing purchase. As Andy says: "No merchant can pay to influence our product Craves, and the user doesn't have to pay us to get them. We make it very clear to our users that we don't make money unless we give you correct recommendations."

Andy explains: "One of the frustrating things people have with recommendations is every time they go in, they see the same thing. But in areas like apparel, fashions change, prices change. Macy's is famous for their prices changing every other day. For us, being able to take in that data and have that applied in real-time is actually very important. It's more than just providing real-time recommendations, it's providing real-time updates."

WHY NEO4J

To solve the technical challenge of delivering this, Cobrain – with its data science knowledge – recognized it needed a graph database engine to make the sometimes billions of rapid computations required. Graph databases are a relatively new technology, but market leader Neo4j is the most established and commercially proven product in this area.

Initially, Cobrain picked a different graph database – one that looked right on paper, but was "still in its building phase," Andy said. But when it came to scaling it up commercially, Cobrain realized the rival product wasn't going to cut it, and turned to Neo4j.

Andy explained: "When it comes to show time, you need backing from the people that are really experts to give you the support you need, especially in the start-up, especially when you are trying to move fast. We decided we really needed Neo4j's enterprise scale and their robust enterprise support structure."

Neo4j has been through the wringer, it supports a very large number of transactions, and there are consumers out there using it. That allows us to sleep.

"We've built an enterprise business out of Neo4j and there's no monetary value I can put to that, it's almost invaluable. As a start-up company we have limited resources, and knowing that there's people out there that will help us is just super important."

Cobrain was also staggered at how quickly and easily it was able to switch to Neo4j and the performance increase it produced – even over another graph database.

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Andy said: "We migrated everything in three weeks. That is huge, we thought this was going to be a multi-month process but it was very fast, a very, very easy smooth process. We also saw a massive performance gain, we saw query times decrease by seconds in some cases. Where things were taking five seconds before, it would drop down to 800 milliseconds."

FUTURE

Cobrain is confident Neo4j can support its scale-up to supporting millions of consumers, and its future plans beyond that. After apparel – the most challenging industry it could find to start in – Cobrain plans to offer real-time personalized recommendations in other retail areas.

Andy said: This was the place we could have the biggest impact and it's also the biggest challenge. If we can do it here we can do it anywhere."

Cobrain is available on the web at **https://cobrain.com**, as well as in the Apple App Store and Google Play Store.

ABOUT NEO TECHNOLOGY

Graphs are everywhere. Neo Technology has been instrumental in bringing the power of graphs to numerous organizations, including a rapidly-growing number of Global 2000 customers, such as Cisco, HP, Accenture, Deutsche Telekom, and Telenor. Serving customers in production for over a decade, Neo4j is the world's leading graph database with the largest ecosystem of partners and tens of thousands of successful deployments.