

CASE STUDY



Fortune 500 Financial Services Company

Real-time Graph Analysis of Financial Data Creates Potential for Millions in Fraud Detection Savings

INDUSTRY

Financial Services

USE CASE

Fraud Detection

GOAL

Decrease amount of time needed to analyze possibly fraudulent financial data through more effective data visualizations

CHALLENGE

Microsoft SQL Server database required huge amounts of JOINS, crippling query efficiency

SOLUTION

Used Neo4j to create simplified data visualizations and perform more efficient queries for faster financial approvals and fraud detection capabilities

RESULTS

- Cut amount of time for manual data analysis significantly, allowing for a large increase in the number of viewed transactions
- Efficient, in-depth, more accurate fraud analysis that saves the company millions of dollars per year

Analysts at this Fortune 500 financial services company rely on large amounts of data to make fast, accurate decisions regarding fraudulent activity in financial transactions. With the real-time data analysis and visualization provided by Neo4j, fraud patterns are identified more accurately and this manual review time is cut significantly, allowing for an increase in the number of reviewed transactions – and stopping millions worth of fraudulent transactions per year.

The Organisation

This Fortune 500 financial services company has customers around the world. Their online services are available in over 30 countries, and include \$2.2 million in financial transactions per month. Over the next five years, the company is planning to expand their online presence to over 200 countries.

The Challenge

The financial services company collects a huge amount of data provided by its customers, as well as enriched data from outside vendors that needs to be analyzed in real time before a transaction can be approved. While the majority of these requests are approved or denied instantly through an automated fraud detection system, potentially fraudulent requests are submitted to an analyst for manual review.

The analyst has a dedicated transaction review tool encompassing all relevant third-party data. However, the analyst had to query a Microsoft SQL Server database to review customer history for an association with fraud rings. These queries can require four or more levels of JOINS, impacting the SLA for reviewing the transaction within the manual review queue.

"It was taking five minutes or more to run a query," said a product manager for fraud detection solutions at the company. "And since our analysts were having to review 10,000 daily transactions, this wasn't sustainable. Also, a relational database wasn't the right solution to perform link analysis queries so it placed a huge burden on our database."

Not only that, but the queries would return complicated data that the analyst had to review in a matter of minutes.

The company needed to find a more efficient way to analyze the data to save time for both their waiting customers and analysts. They explored a number of data package solutions and other data visualization tools, but "the performance wasn't high enough, wasn't available in real-time, and wasn't scalable," said the product manager.

The Strategy

Live data streamed via Splunk from their SQL-based reporting database wasn't available for hours, but fraudsters were completing their work in mere minutes.

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“No one knew a word about graph technology, but Neo4j was very supportive. They gave us the software to play with while the discussions were going on, and provided our teams with in-depth training on its fraud detection capabilities.”

– *Fraud Detection Product Manager,
Fortune 500 Financial Services
Company*

The company needed to tackle two challenges: decrease the amount of time it took to process fraud-detection queries, and provide analysts with simple data visualizations. They also needed a technology that was infinitely scalable.

While there were a number of available graph visualization tools, they were limited in scale and performance by the underlying data store. To achieve the real-time results they needed, the team would need a database optimized for storing and traversing several levels of relationships.

That's when they found Neo4j. A few phone calls later, they began working with the Neo4j team and set up training sessions for their product, engineering and decision science teams both domestically and abroad.

The Solution

While the company had initially sought a turn-key solution to avoid a drawn-out development process, the actual development time with Neo4j wasn't too complex or time-consuming with a pilot project being easily completed during spare time.

Neo4j provided both real-time results with connected data and data visualization that allowed analysts to make faster, more accurate decisions. This opened the door for newer, more extensive searches, which the company hopes to expand from four to 10 degrees of separation.

Company analysts also began noticing clusters and relationships between their data which uncovered new, previously unnoticed potential fraud connections. Each customer can be represented by up to 30 nodes, each with up to 60 properties, totaling over 216 million nodes and 680 million relationships and 20% annual growth in database size.

The Solution

With the data visualizations made possible by Neo4j, manual analyst review time was cut in half. This allows them to review nearly twice the number of transactions daily – stopping fraudulent transactions sooner and reducing wait times for non-fraudulent customers.

Reviewing the data in Neo4j also uncovered new suspicious activity. The emerging clusters and relationships that had previously gone unnoticed introduced the possibility of more accurate, real-time fraud ring detection.

In addition, they began to see the possibilities far beyond their original data visualization use case. The company is integrating Neo4j with their real-time decision platform to instantly stop fraudulent transactions and save the company thousands of dollars per day.

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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