

CASE STUDY

**Royal Bank of Scotland (RBS)**

UK Banking Leader RBS Turns To Neo4j to Boost Developer Productivity

INDUSTRY

Finance

USE CASE

Application Development Change Management / IT Operations

GOAL

Major UK bank RBS needed a better way to manage the development of a core trading platform, Agile Markets

CHALLENGE

A huge internal community of developers were facing complexity and inefficiency through a lack of visibility into the effect of proposed changes to a core application

SOLUTION

Deciding that RDBMS could not offer the level of sophistication of data handling needed, RBS selected Neo4j as the basis for 'Dart' – a bespoke change management tool built to help its developers safely map any change effects on a key trading system's modules

RESULTS

- Granular-level visibility into the effect of any planned system extensions – avoiding 'butterfly effect' ripples of unwanted changes through the system by one programmer's change
- System also supports customer's strong compliance and audit trail requirements, promoting better record keeping and system documentation

Safely and efficiently implementing system changes in a complex IT development environment must always be done correctly. One of the world's leading banks, Royal Bank of Scotland (RBS), has worked with Neo Technology to build its own world-class dependency management system to do just that.

The Company

RBS Group is a Tier One global banking and insurance holding giant, headquartered in Edinburgh, Scotland. The group offers a complete range of retail and business banking services as well as private banking, insurance and corporate finance. Its operating brands include The Royal Bank of Scotland, NatWest, Ulster Bank and Coutts. The Group is one of the largest listed stocks on the London Stock Exchange at north of £20bn (\$30bn) market capitalisation.

The Challenge

RBS has an established reputation in the marketplace as a secure and reliable partner for all of its customers. To make that reputation even stronger, the firm has a stated mission of always striving to build a "stronger, simpler" business – an aim in which the best use of leading-edge technology is key.

Tasked with leading that charge is its City of London-based IT resource. Technology looked after by this core team includes Agile Markets, the firm's investment bank trading platform, set up to support traders in currencies, FX and a wide range of other financial instruments.

Hundreds of RBS developers help to support and extend this mission-critical trading platform. To make their lives easier, RBS IT leadership has been increasingly conscious of the problem of application change management, especially the issue of the ripple effect of a small change that can impact many other programmers' work.

This was a historic challenge exacerbated by internal RBS processes around compliance and on-going use of legacy and even manual processes, says its Senior Software Engineer at Digital & Engineering Services, Stelios Gerogiannakis.

"As we are a bank, we have a regulatory requirement to know what is deployed where, by whom and when; everything has to be vetted and everything has to be checked," he confirms. "And when there's a code change, you can see a 'butterfly effect' sometimes, where a seemingly innocent change in Development or QA or even Production can break in places you have never even thought of."

To better manage change management, meet his compliance objectives and reduce the problems of that 'butterfly effect,' Gerogiannakis has been leading a special project to build a technology solution to aid the team.

The Strategy

The answer Gerogiannakis has come up with is a bespoke internal RBS dependency management tool – Dart. Dart helps by allowing developers to bundle any code change and relevant modules into a safe place, so if they are changing a system, or proposing any kind of a major upgrade to the system and they don't want to start writing individual instructions for each element, a special release of the system can be generated for testing.

CASE STUDY



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“Neo4j was selected because it is built ground-up as graph, so is a true native structure, self-contained and with no external dependencies”

– Stelios Gerogiannakis,
Senior Software Engineer at RBS

If this special release does not pass RBS' stringent testing and quality assurance procedures, Dart tells the programmer to revise their code – a process that repeats until a release with the change is generated that passes all tests, guaranteeing there are no hidden surprises.

This radically simplifies the whole change management process while significantly contributing to overall programming quality, says Gerogiannakis.

“Dart not just automates things for you, it also records all the information you need – when the release was built, which environments, which version, and so on, so you don't need to search right and left,” he says. “The information is there, which really saves time and limits any chance of error.”

The Solution

How was such a system architected? According to Gerogiannakis, right from the outset, the only convincing data framework that could manage the level of complexity RBS' environment demanded was a graph database.

“We knew we needed to store a lot of information. By no means at Big Data levels, but in terms of underlying, inherent complexity, we needed a database management system that could cope properly with that.”

Plainly, such requirements ruled out traditional relational databases, as their rigid definitional requirements and fixed schema would be too restrictive. The other attraction of using a graph solution was the availability of the increasingly-popular query language, Cypher.

And as graphs come in to their own when it comes to storing and expressing data relationships, avoiding the SQL strain suffered by relational databases from JOINS between tables to cater for data connectedness, graphs clearly were the best way forward. But which graph technology?

The answer's simple – Neo Technology's market-leading Neo4j. “Neo4j was selected because it is built ground-up as graph, so is a true native structure, self-contained and with no external dependencies,” says Gerogiannakis.

The Results

According to Gerogiannakis, that decision means RBS now has a 'single source of truth' Neo4j-based platform for its important Agile Markets change management processes. Dart is, in fact, proving so beneficial the plan is to roll it out beyond Agile Markets to the entire RBS Group.

“People are really keen to get Dart here and start automating deployment,” says Gerogiannakis, “because it is just a night and day difference with its help compared to their existing situation.”

So how does Gerogiannakis sum up his journey into graph databases and Neo4j? “Our task was to create a way to allow us to have a more stable environment plus meet our banking and customer needs,” he says. “Neo4j has helped us do just that.”

In fact, it seems Gerogiannakis is still not over his shock of delight about the power of graph databases. “Neo4j is a true knowledge-creation tool,” he enthuses. “It opens so many possibilities and allows you to easily create systems not possible before, or that would be very hard to create.

“Having the experience of developing Dart and working on Dart, it is now hard for me to imagine how such a tool could be implemented without a graph database!”

About Neo4j

Neo4j is an internet-scale, native graph database that leverages connected data to help companies build intelligent applications that meet today's evolving challenges including machine learning and artificial intelligence, fraud detection, real-time recommendations and master data. As the #1 platform for connected data, Neo4j has over three million downloads, the world's largest graph developer community, and over thousands of graph-powered applications in production.

The world's most sophisticated organizations worldwide, from enterprises like Walmart, eBay, UBS, Cisco, HP, adidas and Lufthansa to hot startups like Medium, Musimap and Glowbl, use Neo4j to harness the connections in their data.

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