

## Case Study

Global 50  
Bank

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How Graph Technology & AI Helped a  
Global 50 Bank Lend in Latin America**INDUSTRY**

Financial Services

**USE CASE**Master Data Management /  
Machine Learning**GOAL**Minimize and mitigate  
borrower default risk**CHALLENGE**A relational database couldn't  
handle the bank's massive,  
diverse data**SOLUTION**Implemented Neo4j with  
partner Marionete to create a  
360 view of the bank's master  
data**RESULTS**

- The bank now manages  
around **1 trillion  
relationships** to mitigate  
default risks
- Graph technology laid the  
foundation for future AI  
applications

*One of Latin America's largest corporate and investment banks saw the volume and complexity of their data spiral out of control. Facing regional factors that demanded creditors address exposure to default risk and execute protective strategies, they used Neo4j to implement a solution.*

**The Company**

As part of one of the world's largest financial conglomerates, this leading LatAm Global 50 bank offers a wide range of products and services, such as local- and foreign-currency loans, cash management services, agribusiness funding, real estate credit, project financing and more – all at local, regional and global levels. The bank also offers market insights and strategies into business opportunities, investments, IPOs and other capital market products.

**Our Partner**

[Marionete](#) provides advisory and technical consultancy to deliver commercially focused data science and big data projects. Marionete offers solutions and technical resources to help clients deliver data monetisation, insights and predictive analytics.

**The Challenge**

A two-year stint of negative growth in the LatAm region happened due to a number of factors: changes in Chinese economic activity, a strong U.S. dollar and a sharp decline in commodity prices. These were compounded with domestic political instability, macroeconomic fragilities and corruption scandals.

On top of negative growth, the private sector was experiencing lower credit provisions. Factors included differences in GDP per capita, weaker legal rules to enforce creditor rights and high information asymmetry due to inadequate debtor data.

Marionete was already working with the Global 50 LatAm bank to help minimize exposure to credit risk. However, the towering quantity and expanding diversity of data spanning the bank's siloed databases presented an extreme challenge.

"Beyond effectively managing the data," said Ricardo Miranda, Big Data Engineer at Marionete, "we couldn't generate the real-time insights necessary to quickly identify and respond to threats of credit risk from borrowers."

"If a bank is unable to interpret data quickly to discover the relationship between customer credit risk, as well as if debt interest is paid on time (if at all), you're incapable of evaluating and understanding the exposure level of each and every one of its borrowers," he added.

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– Ricardo Miranda,  
Big Data Engineer, Marionete

The bank’s legacy technology simply couldn’t manage such sweeping amounts of data.

“With various data sources in use, many based on traditional relational database technology (RDBMS), the volume and diversity of data the bank generated couldn’t be harnessed to render real-time analytics and recommendations,” Miranda said.

### The Solution

Marionete addressed the bank’s data challenge by integrating its various databases, including RDBMS, using the [Neo4j](#) graph database. With this level of insight, the bank was equipped to mitigate credit risk and influence bank charges and interest rates.

“With Neo4j [graph technology](#),” said Miranda, “we were able to gain a deeper understanding of the bank’s borrowers, such as their relationships with other economic agents like suppliers, financial intermediaries and customers.”

The digital transformation project was twofold. Marionete created the master data “blueprint” that integrated all of the bank’s disparate data. Marionete also implemented an extensive in-house training program across several of the bank’s divisions.

“With Neo4j installed, we were able to create a data model that relays borrower’s credit scores,” said Miranda. “At the same time, the graph database solution provided the bank with a [complete view of master data](#), all made available in real time.”

Now, Neo4j has become the cornerstone of powerful insight into the bank’s data, helping to reduce credit risk, empower decision making and identify new business opportunities.

### The Results

“The bank now answers more database queries about customers, using the same data, than ever before,” Miranda said. “Neo4j manages around **1 trillion data relationships**.”

Neo4j and its [Cypher](#) query language not only reflect known data relationships but also provide for data relationships that are *yet to be determined*.

The bank has greatly improved its understanding of the relationships between every credit risk variable – both internal and external. And, these data queries are done far more quickly, generating real-time, deep insights into all factual and potential credit risks.

The bank is also planning to enhance this project even further by adding a [machine learning layer](#) over the graph database, as a way to gather immediate information from external and internal sources. AI will also be used to facilitate a sensitivity analysis across the value chain – modifying a range of variables to see how results might change.

“In the past, legacy DBMSs obfuscated credit risk,” Miranda said. “However, graph technology now reveals data relationships that provide fresh insight into the real risks the bank faces.”

Neo4j is the leading graph database platform that drives innovation and competitive advantage at Airbus, Comcast, eBay, NASA, UBS, Walmart and more.

Thousands of community deployments and more than 300 customers harness connected data with Neo4j to reveal how people, processes, locations and systems are interrelated. Using this relationships-first approach, applications built using Neo4j tackle connected data challenges including artificial intelligence, fraud detection, real-time recommendations and master data. Find out more at [Neo4j.com](#).

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