



Kameron Yiu, Analytics & Modeling Manager (left) and **Brian Samarasekera**, Head of Fraud Risk, Analytics and Detection, RBC.

SAS® helps Royal Bank of Canada avoid \$15 million in credit fraud losses

Royal Bank of Canada (RBC) wanted a way to detect fraudulent mortgage, loan and credit line applications before they cost the bank money. The challenge was in preventing fraud without affecting legitimate customers. RBC used SAS® to build a fraud rules application that leverages powerful analytics to target suspect applications.

Industry

Banking and Financial Services

Business Issue

Royal Bank of Canada (RBC) wanted a way to reduce losses by detecting fraudulent mortgages, loans and credit lines before they cost the bank money.

Solution

Using SAS 9.2 and SAS/STAT®, RBC built and validated a decision tree model to deliver suites of fraud rules that target fraudulent credit applications.

Benefits

Within one year RBC had avoided millions in credit fraud losses, with a low false-positive ratio indicating minimal hindrance to legitimate, valid customers.

According to a Government of Canada report,¹ the Canadian banking industry estimates that losses from mortgage fraud range into the hundreds of millions of dollars annually. Mortgages are just one product within a bank's credit portfolio, so this represents a mere fraction of the total lost to fraud each year. Royal Bank of Canada (RBC) wanted to use analytics software to predict credit fraud as a way of preventing such theft before it happens – without affecting its relationships with legitimate customers.

“The best possible antifraud scenario is to prevent it from happening in the first place, but it's a fine line between managing your customer relationships and catching fraudsters – you don't want to interfere with providing service to good customers,” said Brian Samarasekera, Head of Fraud Risk, Analytics and Detection, RBC. “Lending products like mortgages, loans and credit lines are highly competitive, so it's essential to hit the fraudsters only and not impact people who might go to another bank if they have a bad experience.”

RBC wanted to address what Samarasekera described as “a sizable” fraud loss component in its credit portfolio of mortgages, loans and credit lines. As head of the bank's Fraud Risk, Analytics and Detection team he was tasked with developing detection tools to prevent as much fraud loss as possible, without diminishing business growth or affecting RBC's standing with customers.

Credit application documents contain information provided to the bank by customers applying to borrow funds. According to Samarasekera, SAS enables RBC to develop solutions to assess the veracity of customer information at a more advanced, detailed and corroborative level, ultimately helping the bank differentiate between fraudulent and legitimate credit applications.

Previously, RBC had depended primarily on base-level fraud rules, negative file and credit bureau fraud alerts to identify and prevent credit fraud. The bank wanted a more effective method to stem its fraud losses.

“We were having difficulty bringing together disparate data – both from internal and external sources – and initially, we did not know what information was important to us in predicting cases of fraud,” Samarasekera explained. “But we knew we needed an advanced analytical tool to help us analyze all of these disparate data in order to make decisions.”

Kameron Yiu, Analytics & Modeling Manager within Samarasekera's unit, said it was clear that SAS 9.2 was the best option for building a solution given his team's familiarity with SAS and the software's reputation as a powerful analytical tool within RBC and the industry as a whole. With SAS Business Analytics, RBC is now able to bring together disparate data – including application data, bureau data, negative file data and derived-value data – to perform sophisticated data mining,

“Since we launched our SAS-supported fraud-rules engine, RBC has avoided approximately \$15 million in credit fraud losses.”

Brian Samarasekera
Head of Fraud Risk, Analytics and Detection
Royal Bank of Canada

matching and relationship analyses as a means to detect fraud.

“Data never corrupts on its own. If you have the right tools to get at the data, then all the nuggets of relevant information can be skimmed to the top,” Yiu explained. “A good data management tool is essential because you tend to find seasonal spikes, recurring patterns, demographic patterns – all kinds of information that you can carve from data by using the right tools. SAS allowed us to develop a substantially sanitized data environment which was conducive to building and validating a few decision tree models that provided us with suites of fraud rules to target suspected fraudulent credit applications.”

The fact that SAS has joined forces with enterprise data warehouse leader Teradata to optimize how their two systems work together was beneficial to RBC. With the integration of the two, RBC leverages the power of SAS using

the Teradata Customer Enterprise Data Warehouse as a single source of information rather than the multiple sources that existed before. This provides RBC with the ability to execute more quickly on the newest available customer information containing fraudulent or suspicious indicators.

Yiu’s team used SAS/STAT to develop spatial mapping to derive fraud predictive values and identify the movement of fraudsters. This enabled the team to recognize relationships between fraudsters’ behaviors and target areas where fraudsters are most likely to strike.

“The clustering functionality in SAS helps us build effective models by identifying the most significant predictive variables; we use SAS’ segmentation methodology extensively to identify and differentiate fraudulent application patterns,” Yiu said.

SAS Business Analytics also helped the team manage the false-positive ratio of

the fraud rules by containing it to acceptable levels, thereby minimizing negative impact on legitimate customers.

“Since we launched our SAS-based fraud-rules engine 12 months ago after having created a complementing robust operational/investigative environment to treat alerts, RBC has avoided approximately \$15 million in credit fraud losses – a number represented by applications flagged as potential fraud and confirmed so upon investigation, but derived net of all secured provisions,” Samarasekera said. “Coupled with the manageable false-positives, we view that as a huge success.”

¹ www.cisc.gc.ca/products_services/mortgage_fraud/mortgage_fraud_e.html - 2#2



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