How Fraud Detection Model Enhancement Enabled a Leading Credit Card Issuer to Cut Losses by $5M

INDUSTRY

Banking and
Financial Services

CAPABILITY

Fraud Detection
Model Modernization

FUNCTION

Risk & Compliance

TECH STACK

/ AWS
/ Snowflake
/ H2O.ai

Client Overview

Our client is a US-based financial services giant and one of the largest credit card issuers in the country. In addition to credit cards, they offer a range of consumer-facing deposit products such as CDs, MM accounts, IRAs, savings, and checking accounts. Known for their scale and compliance-first approach, they operate in a high-risk, regulated environment.

The Ask

The client needed a new, high-performing fraud detection model to replace their in-house model, compromised due to recent infrastructure modernization. They sought to reduce fraud-related losses during deposit application approvals while also enabling the secure rollout of new checking products.

Challenges

Limited training data due to recent data modernization and evolving fraud attack patterns

Tight timeline for model development to minimize fraud exposure during product rollout

Model Risk Management (MRM) restrictions that limited the use of newer ML techniques or external data sources

Distribution shift in input data resulting in significant performance degradation of the legacy model

Our Solution: Enhanced Fraud Detection for Deposit Acquisitions

Integrated Multi-Source Data for Model Training:
Consolidated internal and external data sources, including candidate attributes, historical fraud tagging, and third-party signals from LexisNexis, ThreatMetrix, and EmailAge, to build a robust master dataset within Snowflake.

Established Pre-processing and Fraud Definition Framework:
Defined eligible application types and created a 90-day fraud prediction window to focus on actionable fraud while filtering out minor or outdated patterns.

Refined and Rebuilt the Model Using MRM-Compliant Techniques:
Selected stable features (CSI < 20%) and built the model using Gradient Boosting Machine (GBM) for its interpretability and speed. Ensured full alignment with MRM by creating and getting approvals for all required documentation.

Accelerated and Validation:
Enabled offline validation and model monitoring setup pre-production. Created automated dashboards and reports to track metrics like KS, AUC, Top% Fraud Capture Rate, and score stability.

Embedded Model Monitoring Framework Post Go-Live:
Deployed a dual-layer performance monitoring system—front-end (score PSI, key feature CSI) and back-end (fraud capture metrics)-to ensure long-term robustness and compliance.

Impact Delivered

$5M reduction in annual fraud losses by replacing the outdated model with a high-performance alternative

30% model performance lift compared to the in-house and vendor models previously in use

Faster go-to-market with a new deposit checking product, enabled by timely deployment of the new fraud detection model

Full compliance with MRM requirements, ensuring model sustainability in a regulated financial environment.

Robust monitoring infrastructure, enabling proactive fraud detection and model health checks with minimal manual oversight

Build fraud decisioning models that evolve with your infrastructure

START CONVERSATION