

GenAI-Powered Fraud Intelligence Reducing Fraud Losses by 32%

Testimonial

“KPI Partners helped us move from reactive fraud detection to proactive fraud intelligence. By combining real-time AI scoring with behavioural GenAI insights, we significantly reduced fraud exposure while improving customer trust and compliance transparency.”

— Chief Risk Officer
Leading Regional Commercial Bank

Client

A mid-sized commercial and retail bank operating across North America, managing over \$45B in assets and processing millions of digital transactions monthly. With increasing digital adoption, fraud risk had escalated across payments, account openings, and card transactions.

Overview

As digital banking volumes surged, fraud detection systems struggled to keep pace with increasingly sophisticated attack patterns. Rule-based systems generated high false positives, impacting customer experience and increasing operational review costs.

The bank needed a scalable AI-driven fraud intelligence system that could detect emerging fraud patterns in real time while minimizing friction for legitimate customers.

KPI Partners was engaged to modernize fraud detection using Enterprise AI.

Challenges

- 18M+ transactions monitored daily
- High false positive rate (22%), impacting customer experience
- Rule-based fraud logic slow to adapt to new attack patterns
- Manual case reviews causing investigation backlogs
- Limited cross-channel fraud visibility (cards, ACH, digital onboarding)

Fraud losses were rising year-over-year, while compliance scrutiny was intensifying.

Our Approach

KPI Partners implemented an AI-driven fraud intelligence framework:

- Real-time ML-based fraud scoring
- Behavioural profiling using GenAI anomaly detection
- Cross-channel fraud signal aggregation
- Automated case prioritization workflows
- Explainable AI layer for regulatory transparency

Solution Overview

The solution unified structured transaction data and unstructured behavioural signals into a centralized fraud intelligence engine.

- Streaming ingestion of real-time transaction data
- AI models trained on historical fraud patterns
- GenAI-based behavioural deviation detection
- Automated alert prioritization and routing
- Executive fraud dashboards with real-time KPIs

How Enterprise AI Lab Approach Was Applied

1. AI Strategy Alignment

Defined fraud loss reduction, false-positive optimization, and regulatory transparency as measurable AI objectives.

2. Unified Data Foundation

Integrated 18M+ daily transactions across cards, ACH, digital onboarding, and customer behaviour into a governed cloud data platform.

3. Predictive + GenAI Intelligence

- ML models for real-time fraud scoring
- GenAI anomaly detection for behavioural drift
- Cross-channel signal correlation

4. Responsible & Explainable AI

- Model explainability layer for audit and compliance
- Transparent decision scoring for regulators

5. AI Industrialization

- Streaming architecture for millisecond scoring
- Automated case routing and investigation prioritization

Key Technologies

- Enterprise Fraud AI Engine
- GenAI Behavioral Intelligence Layer
- Real-Time Data Streaming Architecture
- Cloud Data Platform
- Power BI Executive Dashboards

Business Impact

32% Reduction in Fraud Losses

Significant decrease in confirmed fraud cases within 9 months.

41% Reduction in False Positives

Improved customer experience and reduced unnecessary transaction declines.

55% Faster Case Resolution

AI-prioritized investigations reduced backlog dramatically.

\$18M Annualized Fraud Savings

Direct financial impact from loss prevention.

Real-Time Risk Visibility

Executive leadership gained live fraud risk exposure dashboards.

Why This Worked

Risk-first architecture

Built to reduce financial exposure, not just flag transactions.

Adaptive AI

Models continuously learned from new fraud patterns.

Customer-centric design

Minimized friction while strengthening security.

About KPI Partners

KPI Partners is a global analytics and digital transformation firm delivering solutions across Data Science, GenAI, AI/ML, Data Engineering, Analytics & Visualization, Cloud Data Platforms, and DevOps/DevSecOps/MLOps. Founded in 2006 and headquartered in Newark, California, KPI Partners has delivered over 1,000 engagements for 300+ clients across multiple industries.

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