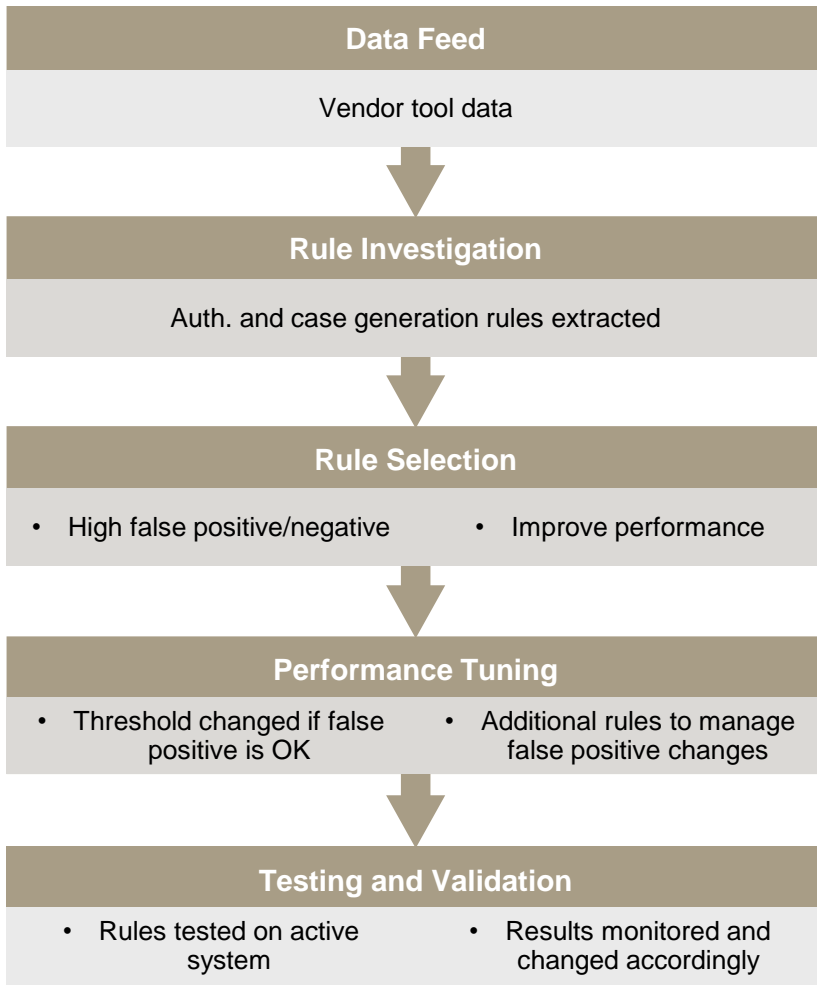


Case Study – Fraud Analytics

Case Study: Transaction Rules Management for Payments Fraud (1/2)

CRISIL Approach



Background

- One of the leading NA banks evaluated a payments fraud framework
- The bank used a third-party decision tool to process/stop payments
- It used customized rules in addition to the decision score
- Customers complained due to high false positive rates

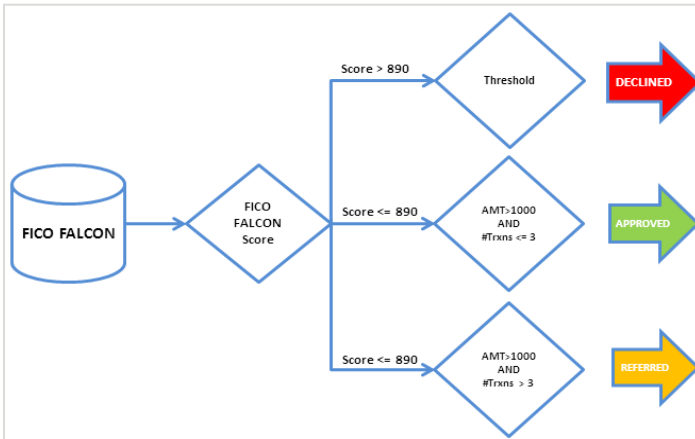
Business Objective

- Develop new transaction rules for authorization and case management
- Follow segmentation approach for customization of rules
- Reduce customer complaints and improve account fraud capture rates
- Monitor rules to modify parameters proactively

Case Study: Transaction Rules Management for Payments Fraud (2/2)

Implementation

- Sample rule after analyzing scores and transactional characteristics



- Rules tested on regular transactions
- Rules moved into authorization or case management

Client Impact

- False positive rates for certain rules reduced by 30–50%
- Changes in account fraud rate were minimal
- Case management operations were reduced
- Monitoring helped uncover new modus operandi quickly

Key Insights

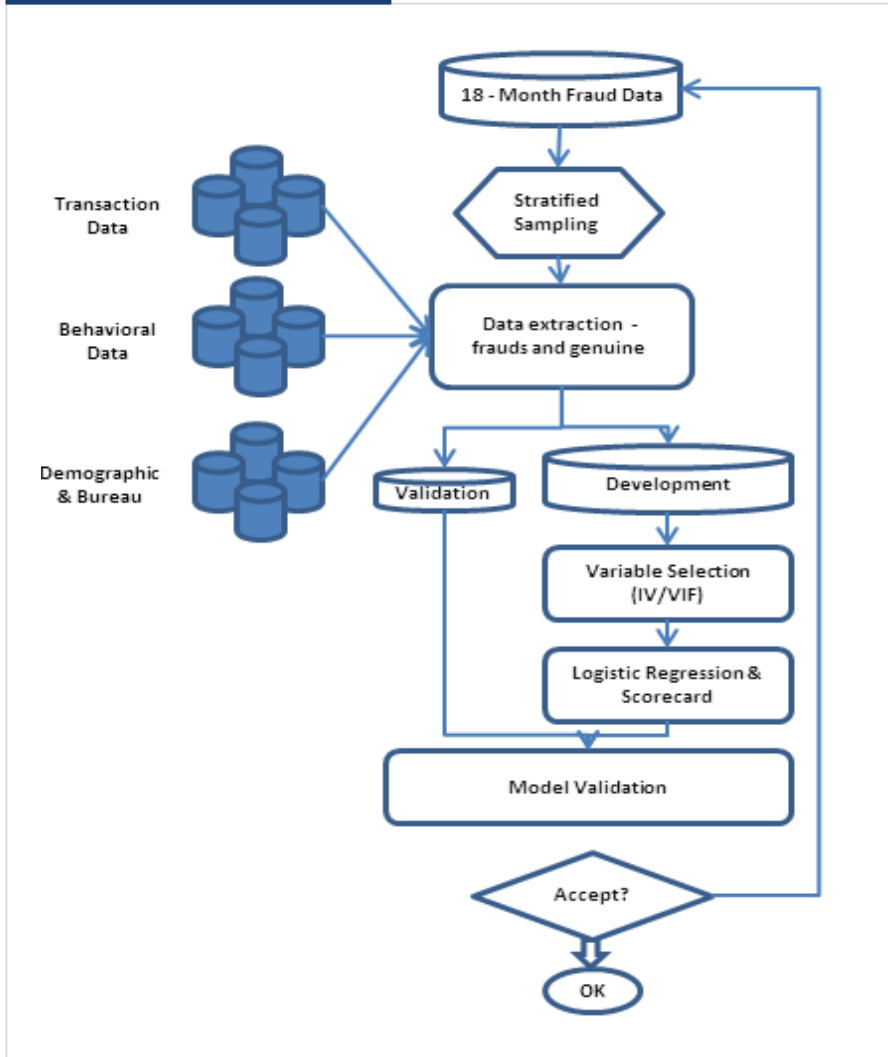
- Decision scores were based on past transactions
- Sudden changes in characteristics were not captured
- Genuine transactions were tagged as fraudulent
- Good profiles were built through seemingly genuine transactions

Key Variables in Rules Optimization

- Type of transaction
- Merchant type or description
- Time of transaction
- Amount of transaction
- Previous instances of fraud
- User-defined variables reflecting observed trends
- Variables across segments may vary accordingly

Case Study: Reducing False Positives in Transactional Fraud – Check Credit (1/2)

CRISIL Approach



Background

- CRISIL was approached by a large EU-based BHC to reduce check credit losses
- Fraudsters were using fictitious checks and withdrawing funds
- Blocking of funds to control withdrawals impacted genuine customers
- High volumes made manual operations infeasible

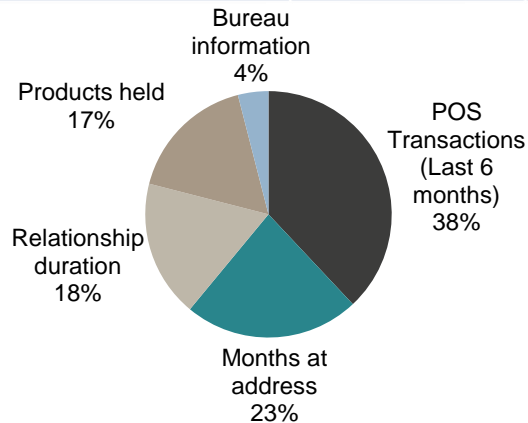
Business Objective

- Devise a methodology that ranks credit entries based on
 - Transactional
 - Behavioral
 - Demographical parameters
- Differentiate high-risk entries from low-risk ones

Case Study: Reducing False Positives in Transactional Fraud – Check Credit (2/2)

Key Predictor Variables

Factors	Relationship with Target Variable	%Contribution
POS Transactions in last 6 months	Negative	38%
Months residing at current address	Negative	23%
Relationship duration with the bank	Negative	18%
Products held	Negative	17%
Bureau information of worst status	Positive	4%



Model Implementation

- Predictors were taken from pool of transaction, demographic and behavioral variables
- Predictors were selected based on Information Value (IV) and Variance Inflation Factor (VIF)
- Predictors having low IV or displaying multicollinearity were removed
- Weight of evidence and stepwise logistic regression were used to build the model
- Scores were assigned based on the estimates from the regression model

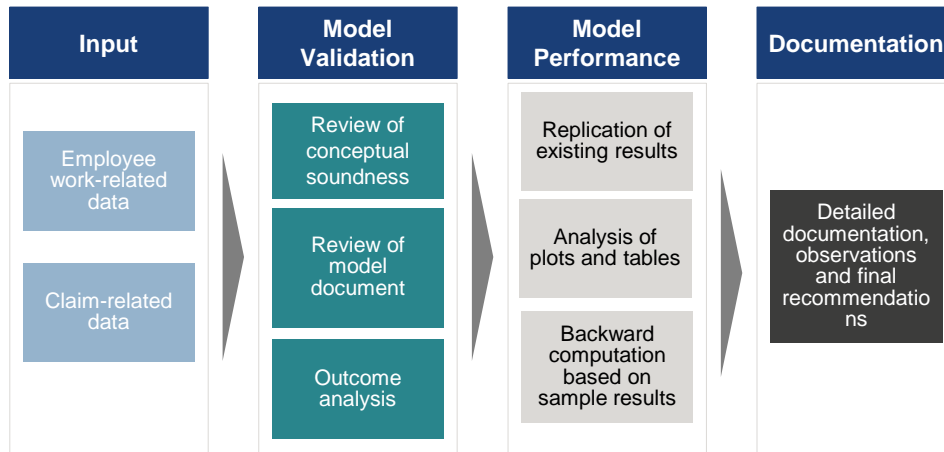
Model Performance

- Area under the curve (ROC) was 92 percent, thus indicating good predictive power
- GINI coefficient was 84% as compared to 70% in the previous model
- Stability of the new model was not affected as shown in the PSI (.02) and CSI

Client Impact

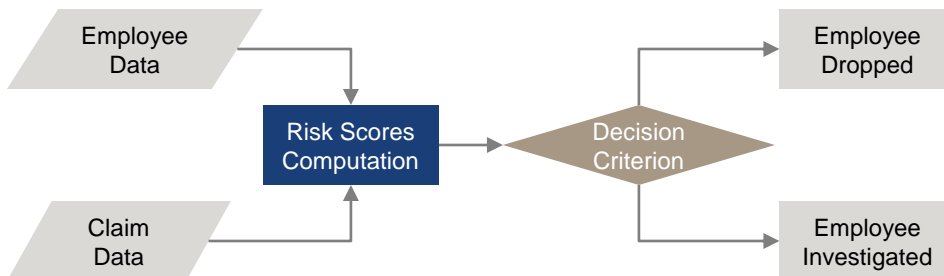
- False positive rates improved from 1 in 16 frauds to 1 in 9 frauds
- Unpaid capture rates increased by 50%, after the discovery of the additional segment
- Operational overheads were reduced

Case Study: Internal Fraud Model Validation



Sample Results

	V1	V2	V3	V3	V4	Mean	SD	Decision Criterion	Decision
A1	11	0.557	0.595	0.391	0.579	0.530	0.094	0.265	Output
A2	6	0.667	0.694	0.313	0.417	0.523	0.188	0.261	Output
A3	6	0.833	0.667	0.313	0.278	0.523	0.272	0.261	Dropped
A4	10	0.630	0.560	0.420	0.480	0.523	0.092	0.261	Output
A5	6	0.833	0.556	0.208	0.417	0.503	0.262	0.252	Dropped



Description

- Validated a model for detecting employees committing consumer-account and credit-card frauds
- The model was awarded a patent by the US Patents and Trademark Office
- The model was a simple formula-based scoring model to identify anomalies based on data grouping using expert judgment

Execution Highlights

- Data Validation:** Validated data sources for their relevance and timeliness, and assessed the quality checks made by the developer
- Conceptual Soundness Check:** The model development team was queried on various tested methodologies and assumptions, and assessed the responses qualitatively.
- Analysis of Tables and Results:** The CRISIL team validated the tables and results provided in the model development document and performed backward computation to check the model's conceptual soundness assessment

Client Impact

- Validated the model and prepared the Internal Fraud Validation Document within the stringent deadline for CCAR submission

Case Study: Wire Payment Fraud Detection Model Validation (1/2)

Client

- A large US-based financial institution

Objective and Scope of the Project

- A US-based financial institution had to validate its wire payment fraud detection model for strategy purposes and CCAR submission
- The scope was to validate the bank's model for two large US portfolios and provide a decision on the model's use by the bank

Description of the Project

- CRISIL GR&A performed validation of the wire payment fraud detection model. This involved:
 - Reviewing all the documents submitted for validation and assessing whether more information was required from stakeholders of the model to complete the thorough validation process
 - Holding regular discussions with stakeholders of the model to ensure that all ambiguities in their reports were removed and additional tests were conducted (suggested by Crisil) to evaluate the model's performance

Validation Methodology

- Thorough study of the model white paper and other documents and research articles relevant to the understanding of the model
- Review all the tests done by the developers for evaluating the model's performance
- Prescribe performance tests other than those done by the model developer and review the results of these tests as well

Validation Highlights

- The model was found to be not performing well
- Suggested new performance metrics to evaluate the model
- Gave a variety of suggestions to enhance the quality of the model documentation

Client Impact

- The model was validated in a very short time
- CRISIL GR&A provided insights for future model use
- Created a thorough validation document to be used by the client for CCAR submission
- Overall, client was very happy with the validation work