VERAFIN

Fighting Financial Crime together.



Model Risk Management Framework



Board of Governors of the Federal Reserve System
Office of the Comptroller of the Currency

April 4, 2011

SUPERVISORY GUIDANCE ON MODEL RISK MANAGEMENT

SR 11-7 *www.federalreserve.gov*

Model validation is a critical function within your risk management group,

and Verafin has a role to play as a provider of models.

A dedicated team at Verafin

to improve the process and optimize the system *through the lens of model validation*.



This is about
more than
compliance.



Empowering your program
for efficient and effective
crime fighting.



Key elements of Model Risk Management:

- ✓ Robust model development, implementation, and use
- ✓ Sound model validation
- ✓ Governance, policies, and controls

https://www.federalreserve.gov/boarddocs/srletters/2011/sr1107a1.pdf



Model Development Process

Customer-Driven Development

Learn. Build. Measure.





Bank provides:

- Expertise in banking
- Deep understanding of their institution's unique needs, procedures and risk profiles
- Review of alerts
- Data for testing

VERAFIN

Verafin provides:

- Expertise in artificial intelligence (AI)
- Innovative technology that supports process
- Proven lean process to ensure exceptional, fast and iterative solutions

Deloitte.

We have partnered with Deloitte to provide a report on the internal control activities we have in place surrounding our *model development process*.

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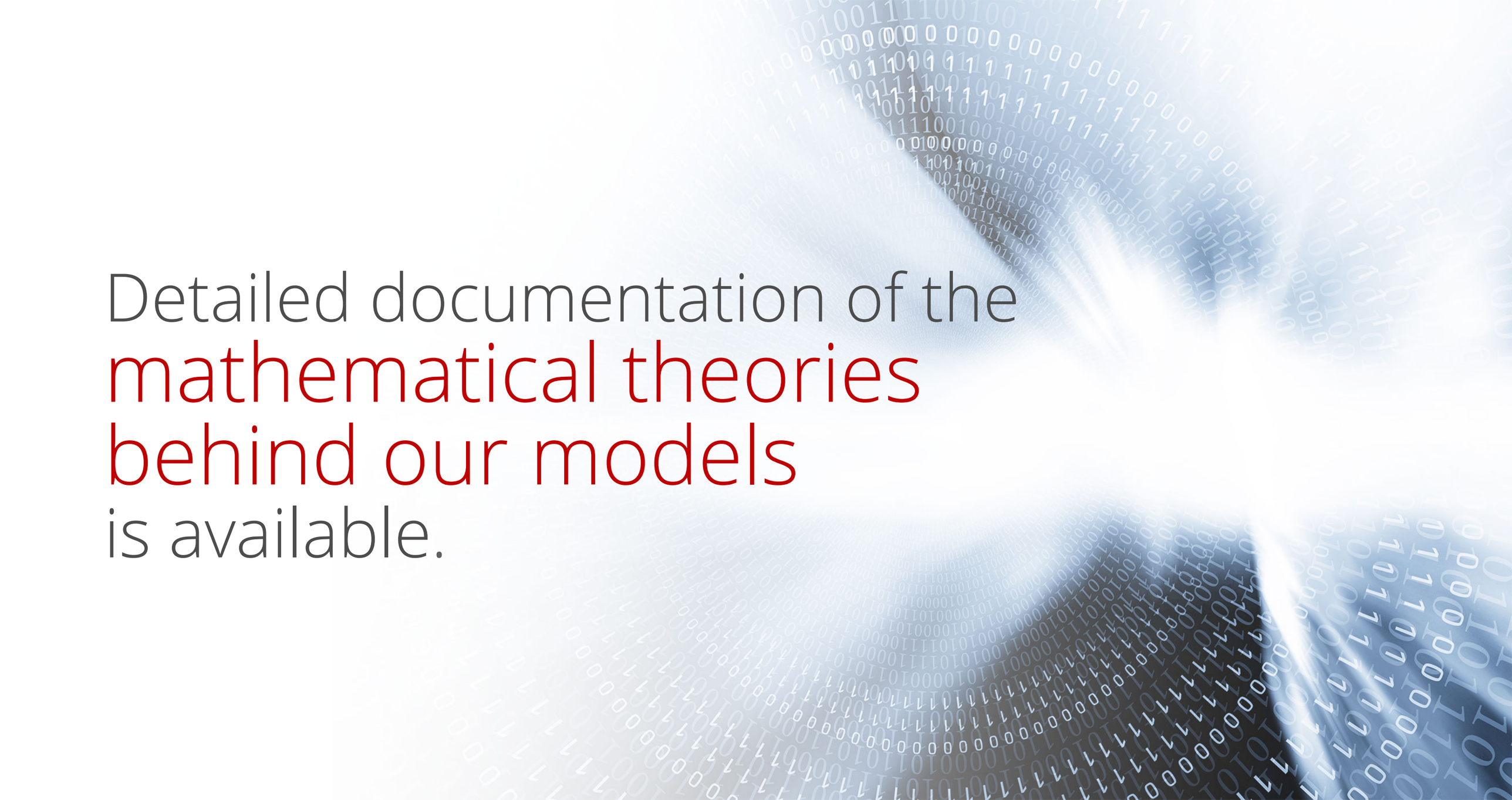
The examination focused on *how Verafin helps* financial institutions demonstrate alignment to the Supervisory Guidance on Model Risk Management.

Model Validation Documentation




Detailed documentation of the
mathematical theories
behind our models
is available.

Agent Card: Account Fraud v1.0
Check Fraud – Check Number Jump

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1.866.781.8433 | info@verafin.com | www.verafin.com

The Check Fraud – Check Number Jump agent analyzes checks for gaps or jumps between check numbers.

Check fraud (or in-clearing check fraud) occurs when someone uses a stolen blank check or produces a counterfeit check. Checks may be obtained from mail boxes, homes, businesses, and even banks.

In a typical **Check Number Jump** scenario, a fraudster will create a check from a new or stolen checkbook and guess at the number to use on the check. For example, they may create a fake check with the number 401, unaware that it is very different than the current sequence of checks in the 100s being used by the account holder. This agent analyzes check data received by Verafin from financial institutions to find instances of this type of fraudulent behavior.

Alert Generation

The Check Fraud – Check Number Jump agent considers 6 pieces of evidence:

- **Check Amount**
- **Check Number Jump**
- **Encoding Errors**
- **Recurring Withdrawal**
- **Unusual Amount**
- **Unusual Institution**
- **Positive Pay Account**

Verafin analyzes three years of check history data to find checkbooks to which the the suspect check may belong. The risk score assigned to the evidence increases as the gap between check sequence numbers increases.

To eliminate unnecessary alerts, Verafin analyzes check sequence numbers and dates in order to "cluster" checks into checkbooks to determine if there is a sequence jump that is out of pattern. If clusters are found, the analysis proceeds. If no clusters are found, the check is not analyzed because there is no point of reference to determine if there is a jump.

Example

A husband and wife share a checkbook and they post-date their checks to pay their rent for the year (checks # 1-12). They continue to use checks to pay their bills during the year. In July, the couple is currently on check # 32, and check # 7 clears for July's rent. Verafin looks at the check to determine whether the check is out of sequence; however, Verafin will attempt to "cluster" the rent checks based on transactional history (check sequence number and dates) to eliminate an alert from generating when the check is, in fact, legitimate and in sequence with the earlier post-dated rent checks.

Assumptions

- Any check in an exempt sequence range is ignored by the check analysis. This includes real checks, e-checks, and cashier's checks.
- Entities and accounts that have been added to the analysis exemption list (from the *Exemption* page) are ignored.
- Checks with a check sequence number that matches the account number or institution routing number are excluded.
- General Ledger (GL) accounts are excluded from check fraud analysis.

Limitations

- At least six historical checks are required on the account to analyze a check.

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Agent Card: Account Fraud
Check Fraud – Check Number Jump

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Validation

To ensure accurate validation, Verafin obtains data from your banking system and then analyzes the transactions and information received. If Verafin detects a suspicious transaction, evidence of fraud, or a possible watch list match, then an alert is generated to notify you that the transaction or evidence must be investigated. The generated alert provides evidence and detailed information describing why the alert was generated and information to help you determine if a case should be created for further investigation.

Validation is against check return data across the cloud (or for a financial institution, where available). This validation is dependent on the return data having correct and consistent return codes.

Configuration and Defaults

You can configure the following parameters for this agent:

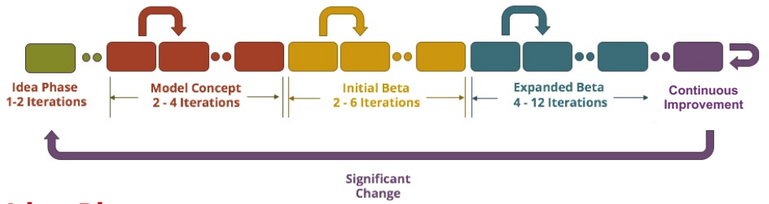
- Ignore Checks Below: Checks below the value threshold are ignored during the analysis.
- Exempt Sequence Ranges: Exempts a check sequence range from analysis. Check sequence ranges can encompass multiple checks or a single check. This includes real checks, eChecks, and cashier's checks.
- Exempt Positive Pay Accounts: When set to "Yes", Positive Pay accounts are exempt from analysis and will not generate Check Number Jump alerts on checks written from these accounts.

Governance and Controls

The integrity of the underlying model for this agent is governed by the following controls:

- Customer Support and Relationship Management processes identify problems/opportunities for improvement to the model.
- Monitoring and Customer Support inputs are taken as inputs by the Product Management Team during monthly planning cycles to set priorities.
- Closely followed Lean Loop Process to continually validate that we are effectively solving a worthwhile problem through continuous feedback from customers and/or from Verafin's internal measurements.

Lean Loop Process



Idea Phase
November 2017
- Decision to write an agent to catch this check fraud scenario

Model Concept
December 2017
- Story deck created to explain assumptions of agent
- Customer interviews to review development alerts generated on non-production environments

Initial Beta
January 2018
- Increased accuracy of the agent by having a customer use the solution in a production environment

Expanded Beta
March 2018
- Agent accuracy and performance continued to increase
- Analytics were fine-tuned
- More customers began using it in production

Continuous Improvement
October 2018 to now
- The agent released to Verafin's customer base in a product update
- Feedback used to for continuous improvement of performance

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Agent Card: Account Fraud
Check Fraud – Check Number Jump

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Significant Agent Inputs: Agent Inputs and Fields

Evidence	Description	Verafin Objects (Used as input)	Field Name (from object)
Check Amount	Generates a risk score based on the dollar amount of the check. The risk starts at 0 for $500 checks and increases to 100 for checks valued at $5000 or more. The **Check Amount** is included in the alert information card.	Transaction	transactionDate
			chequeSequenceNumber
			product
			transactionmessage
			totalvalue

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Agent Card: BSA/AML
Check Fraud – Check Number Jump

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Source Field Mapping: Transaction

Verafin Object	Verafin Field	Data Coverage	Data Source	Data Field
Transaction	transactionDate	100%	Transaction Extract	Run Date
			Check21	Bundle Business Date
			BSA Teller Extract	TransactionBusinessDate
			NACHA	Batch Header/Effective Entry date
			Check21	BofdBusinessDate
			wireXchange	TransferDate

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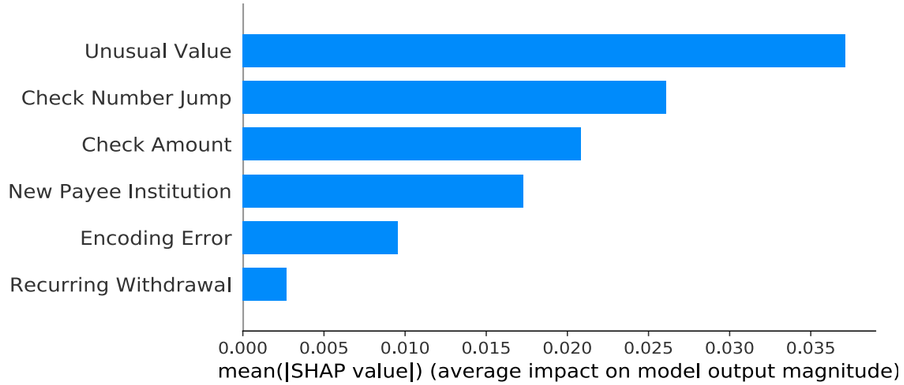
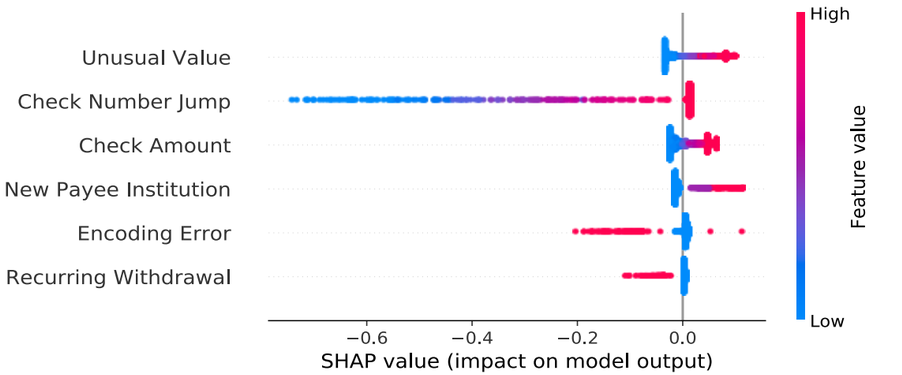
Sensitivity Analysis

Verafin Cloud Data





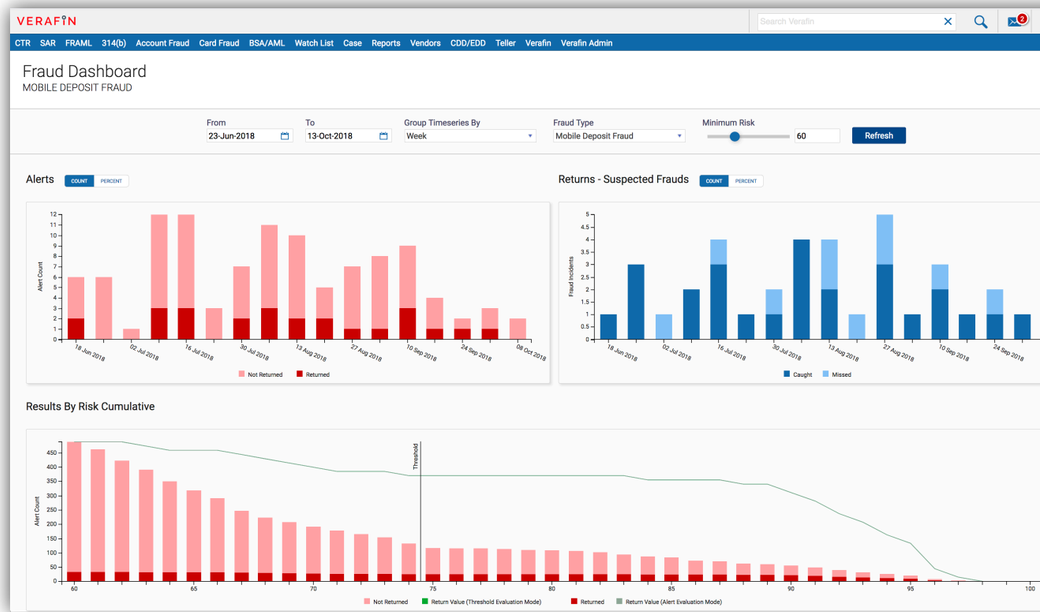
Model Use

Performance Dashboards



Easily monitor and gauge performance of models with visual dashboards.





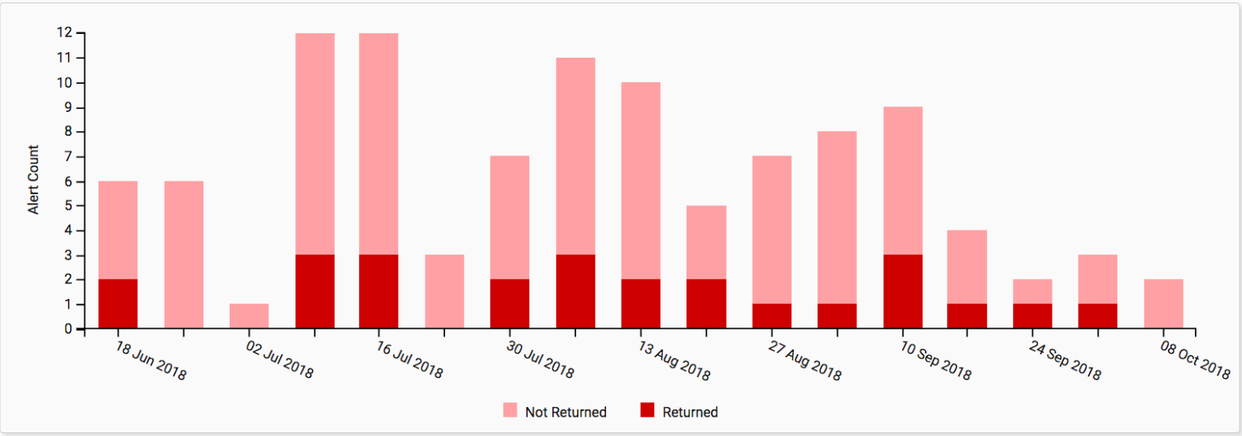
Fraud Dashboard

MOBILE DEPOSIT FRAUD

From 23-Jun-2018 To 13-Oct-2018 Group Timeseries By Week Fraud Type Mobile Deposit Fraud Minimum Risk 60 Refresh

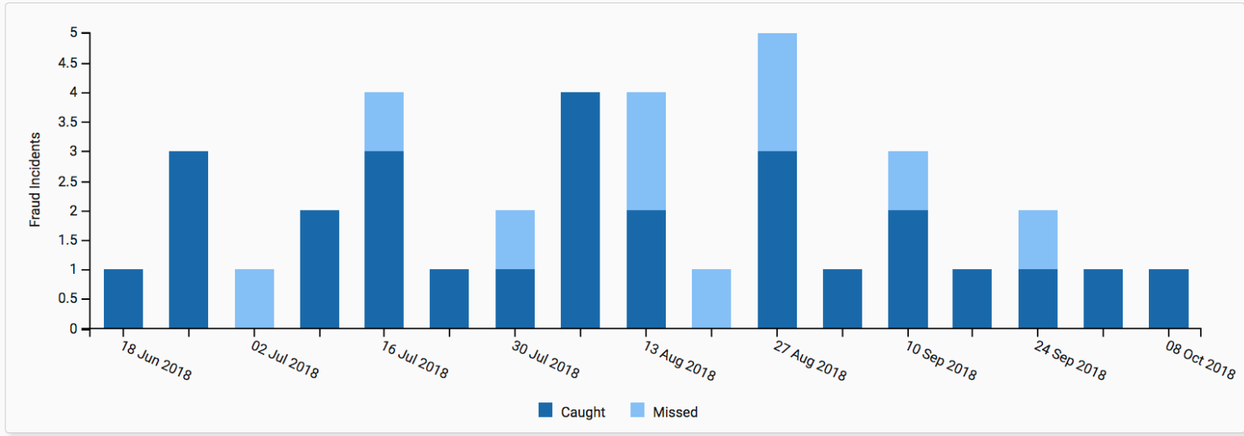
Alerts

COUNT PERCENT



Returns - Suspected Frauds

COUNT PERCENT



Results By Risk Cumulative

