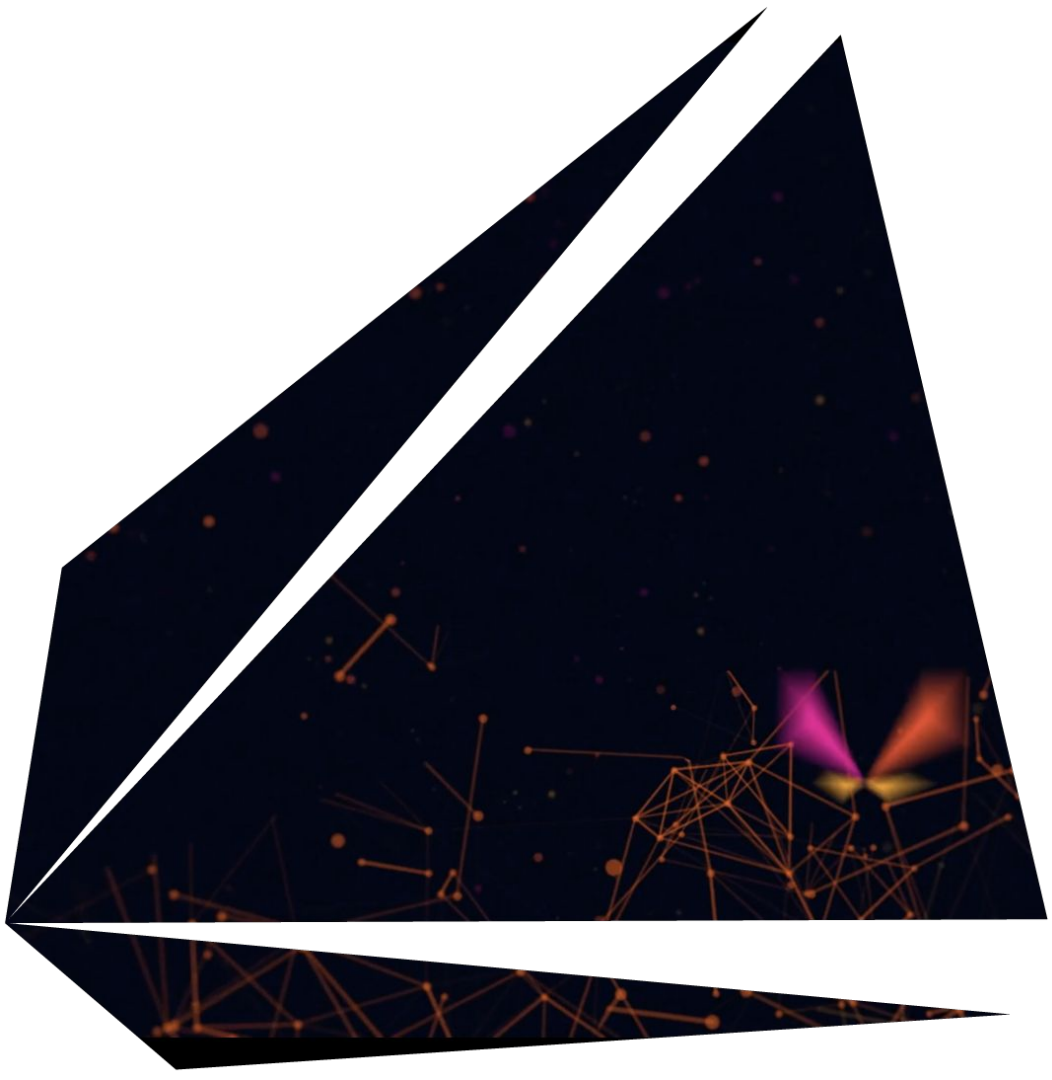

Countering Consumer Fraud and Scams with National Fraud Portals

FNA

About FNA

FNA is a leader in advanced network analytics and simulation.

FNA's software is used to uncover hidden connections and anomalies in large, complex datasets; to predict the impact of stress events; and to optimally configure financial systems and infrastructures.

FNA is trusted by the world's largest central banks, government authorities, commercial banks and financial infrastructures.

- Bank of England
- Monetary Authority of Singapore
- Hong Kong Monetary Authority
- Saudi Central Bank
- Bank for International Settlements
- Banco de la República-Colombia
- US Department of the Treasury
- US Department of Defense
- The World Bank
- ICE Clear Credit
- Giesecke+ Devrient
- Fnality
- CME Group
- Payments Canada
- CLS Group
- The Clearing House
- UK Finance
- PayNet PAYMENTS NETWORK MALAYSIA

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1 Background & National Fraud Portal

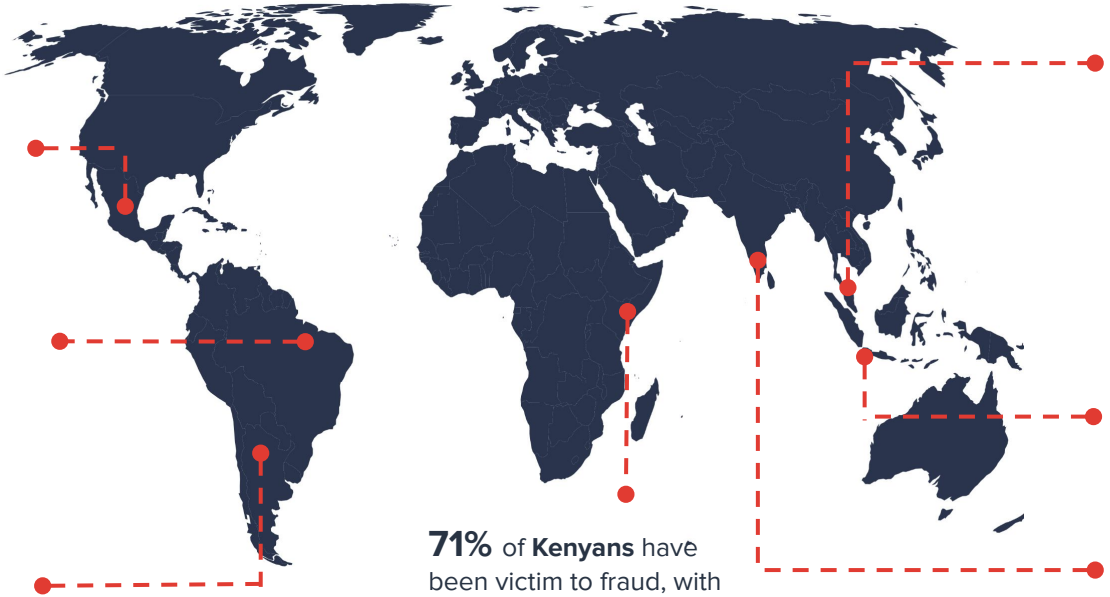
Society's most vulnerable are facing a scam & fraud epidemic

In Mexico, 27% of Mexicans fall victim to scammers as annual losses reach **US$17 billion (1% of GDP)**

In Brazil, 70% of scams originate in PIX

Reported losses to scams were **close to US$ 247 million.**

In Latam, reported **mule accounts have increased 100%.**



Malaysians lost **$567M** fraudsters across 35,916 cases in '23

22.2% of **Indonesians** victim of fraud in past 4 yrs

45% of **India's** population was victim to fraud over the past four years

71% of **Kenyans** have been victim to fraud, with **no reimbursement for 64%**

Over $1 Trillion was lost to fraudsters globally in 2023

Why now and what next?

- **The introduction of instant payment systems** have allowed criminals to acquire funds faster and an obscure the source of funds moving money intraday through sophisticated money mule networks across banks and payment schemes

- **Financial inclusion** has created a large, less financially literate population open to falling victim to fraud and scams.

- **Artificial Intelligence (AI) and Large Language Models (LLMs)** specifically developed for illicit use cases, such as FraudGPT, allow criminals to scale up scams and reach consumers in a wider range of languages and geographies.

High and growing fraud rates can lead to the erosion of confidence in digital payments, with damaging consequences for national economic and financial development objectives.

The Problem with Current Approaches

- **Banks** who are traditionally responsible for fraud operate in silos allowing criminals to evade detection and prosecution by moving fraudulent funds across FIs, payment schemes, and even national borders.
- **Cross bank systems to track funds** are slow or non-existent, meaning massive amounts of ill-gotten funds exit the banking system. Cross scheme tracking does not exist.
- **Liability** for scams (APP fraud losses) often rests with the consumers.
- **Peoples'** expectations differ wildly from the reality.

Political and societal pressures to reduce consumer losses are driving political leadership, central banks, and consumer protection authorities to look for solutions

National Fraud Portal Benefits

Consumers

- Recover stolen funds
- Protection from scam/fraud
- Maintain confidence in payments & digital commerce

Financial Institutions

- Better customer service
- Increased efficiency
- Lifts up smaller FIs that have less resources
- Avoid more heavy regulatory approaches

Law enforcement / FIU

- Identify new schemes faster
- Access better data for preparing cases
- Uncover wider criminal schemes, identify ‘big fish’ individuals, trend analysis

Central Banks & Supervisors

- Safer payment systems
- Better data for AML supervision
- Protect investments in financial inclusion

FMIs

- Protect investment in instant payments
- New value added service

National Fraud Portal Components

Pre-settlement

- GraphAI based Transaction scoring
- GraphAI based Account scoring

Post-settlement

- Fraud & Scam Reporting
- Case Management
  - Validation
  - Prioritization
  - Workflow
- Tracing & Tracking of Funds

Criminal Investigation

- Related-parties analysis
- Case aggregation and assignment

Data Management

- NFP Data Hub
- Shared mule database

NFP as a Service

The NFP as a Service is a fully functional and vertically integrated national fraud portal running on scalable cloud infrastructure and employing data driven efficiencies in every step of the process.

A Turn-key Solution

- A standard configuration of the NFP (for User Acceptance Testing and Site Integration) can be set up in days - accelerating testing and adoption

Standardized connectivity

- Standard data integrations exist and ready to be leveraged
- Stakeholders access NFP and stream in/out data with secure connections

Scalable Cloud Infrastructure

- The NFP runs on private and public cloud infrastructure
- High performance for very large payment volumes and ability to deploy latest AI models

Enterprise-grade

- Enterprise-grade security and availability features, including high availability including the option of hot failover, robust response time SLAs, encryption at rest and in transit.
- Supports Privacy-Enhancing Technologies, granular access controls across participants, and multi-site deployments.

2 Post-settlement Components

Post-settlement Solutions

Post-settlement solutions refer to workflows that happen after a fraudulent transaction has settled and enters the money laundering and cash-out process.

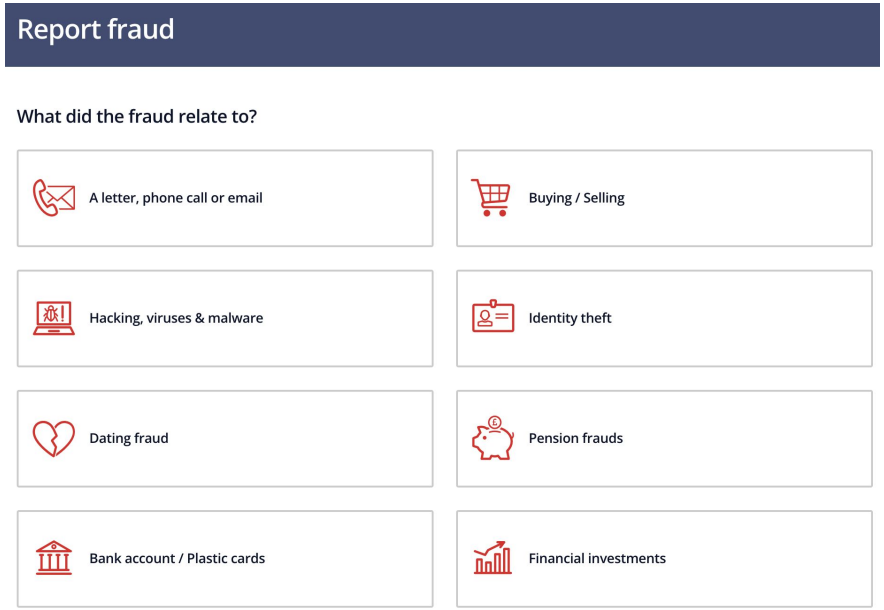
The National Fraud Portal offers post-settlement components for:

3. Improving the capture of initial fraud reports (by banks, police, or other stakeholders)
2. Data driven automated case validation and prioritization
3. Assigning connected cases to same officers & tools to make investigations faster

1. Fraud Incident Reporting

Online reporting

- Victims can report incidents online
- Reports can be used by both law enforcement (to go after criminals) and banks (to start money recovery)
- Localization

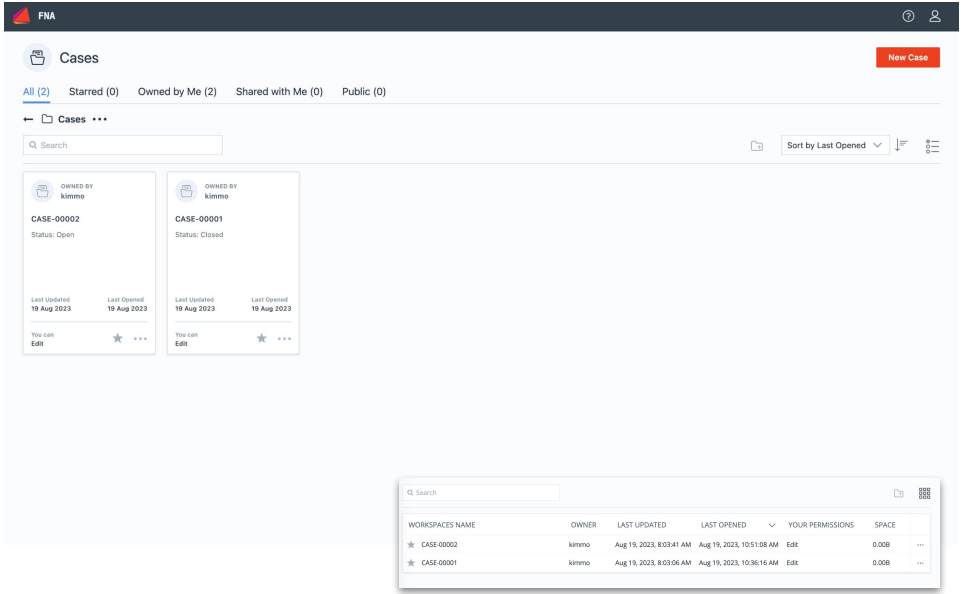


Capture more fraud cases with better contextual data for validation, prioritization and investigation

2. Case Validation & Prioritization

Case Validation

- Fraud reports may be related to disputes or be themselves fraudulent or duplicates
- Quick validation of cases is essential for quickly
- The NFP offers a data-driven method to validate cases eg. many mule accounts on money trail



Case Prioritization

- The NFP calculates for each case an estimate of funds recovered based on past performance and predictive modeling.
- This allows case supervisors to maximize chances of recovery

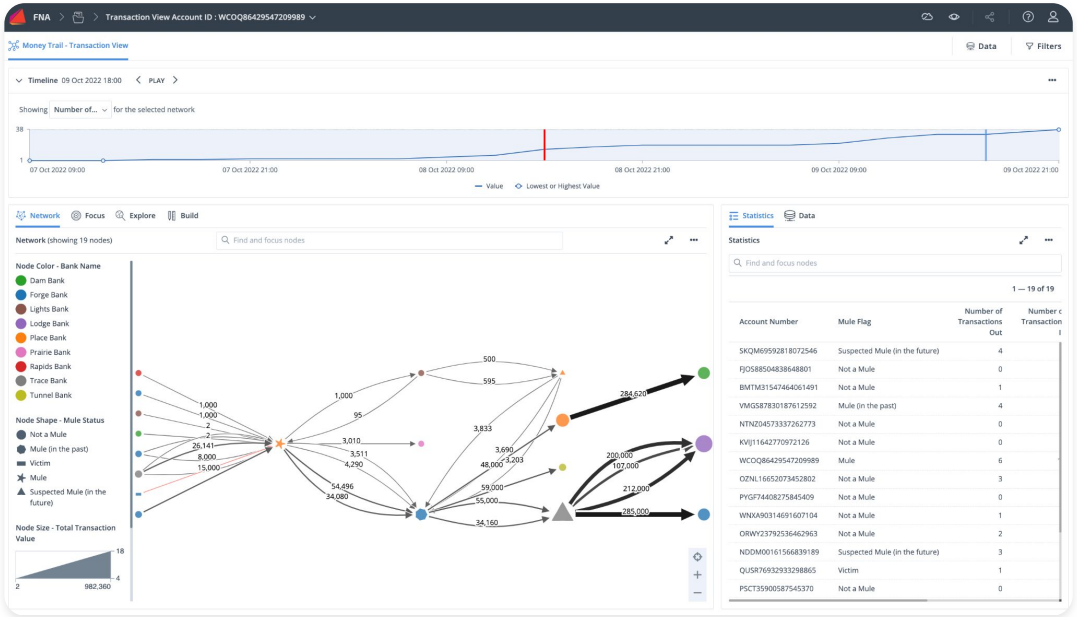
Prioritise cases to investigate, improving efficiency, response time and higher funds recovery

3. Funds Recovery

1. Money trail is automatically generated for each case based on real-time data

2. Case officers from different banks collaboratively use money trails, add missing payments data and earmark funds as per agreed rules

3. Once case is closed the funds recovery process begins



Reduce investigations from weeks to minutes, enabling higher recovery rates

4. Mule & Criminal Investigations

Mule Scoring

- Graph AI based model to identity undetected mules before they are part of a fraudulent transaction.

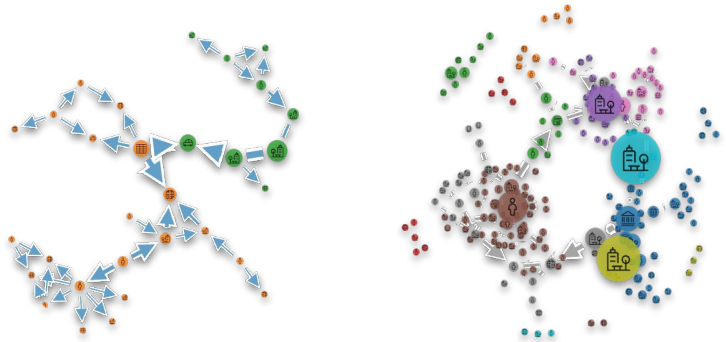
Case Assignment

- Assignment of connected mule investigation cases to same officer for increased efficiencies.
- Connections can be based on Money Trails or related party analysis.

Investigation Support

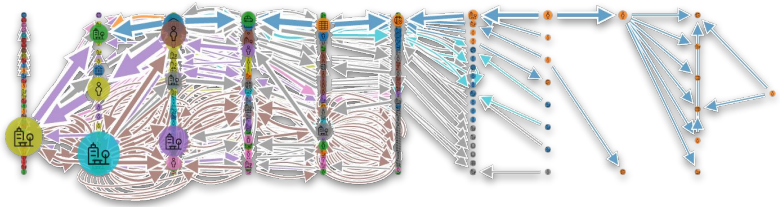
- Related party analytics to support mule account investigations
- Eg. tieing in other datasets like corporate records, beneficial owner data, crypto transactions, etc

Improve mule databases for fraud prevention models and support existing investigations



Above: 2 of 23 separate AML, SAR, and US Homeland Security Investigation Networks

Below: 23 of 23 separate investigations combined with applied analytics delivered to US DHS and returned in part to impacted financial institutions



3 Pre-settlement Components

Pre-settlement Solutions

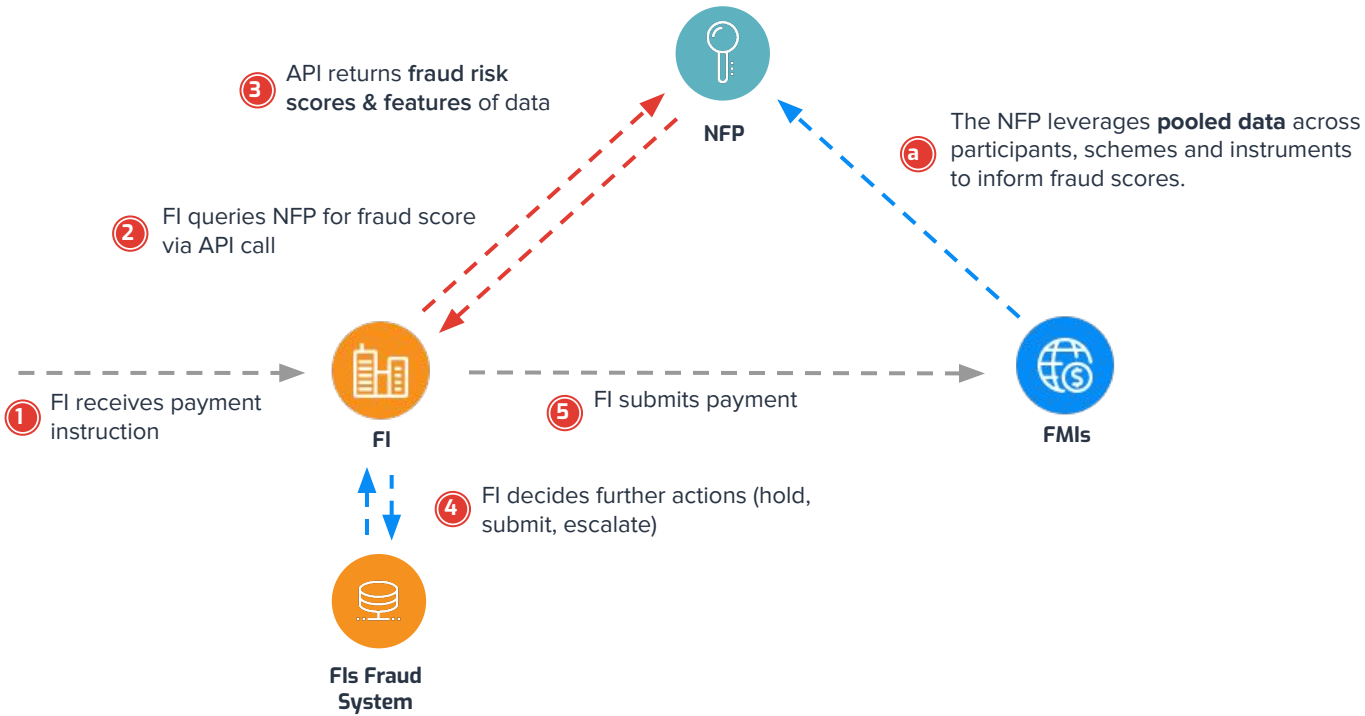
Real-time Transaction Scores

- Scores are calculated using purpose-built Machine Learning models based on Graph Neural Networks
- Significantly enhancing what models deployed at the FI-level are able to achieve.

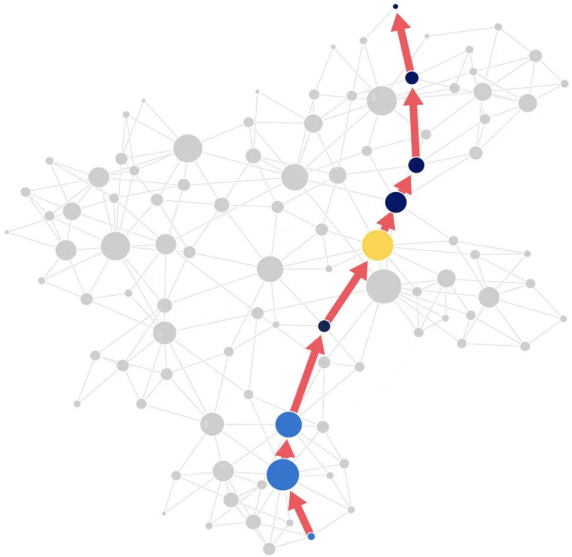
Fraud Score API

- Provides FIs with the ability to access transaction and account scores and other data in real-time
- FIs decide at their discretion how they use the data (eg to stop payment or ask consumer more details)
- Potentially accessed at the same time as Payee Verification

Pre-settlement Fraud Scoring Functional architecture



Graph Neural Networks



Example: a long graph distance (here 8 links) between Sender and Receiver may indicate an anomalous payment. The graph is constructed from all payments that have taken place in the network before the payment being evaluated.

Features are inputs to the Machine Learning model and characterize accounts

- **Traditional (non-graph) models** which depend on the behaviour of a given account, e.g. number of days active, number/value of payments sent
- **Graph Neural Networks (GNNs)** which depend on the behaviour of all accounts, and in particular the behavior of "neighbouring" accounts (i.e. accounts which have a transaction history with a given account). GNNs also rely on less data fields and do not need Personally Identifiable Information to work.

Adding GNNs based on pooled data can double model performance over using traditional models only.

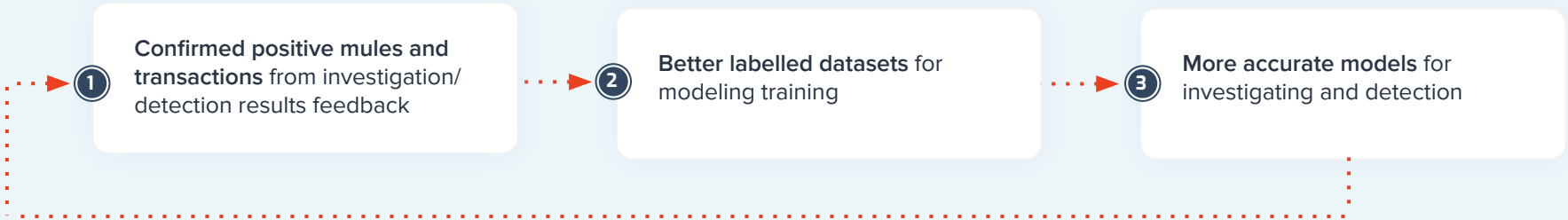
FNA provides 100+ ready-made features which can be mixed and matched to produce a final fraud risk score

Integrated with post-settlement components for maximal effectiveness

With API connectivity between stakeholders, confirmed case data collected from post-settlement systems supports a virtuous cycle of improved model accuracy over time.

Benefits

- More efficient investigation with improved prioritization and validation of investigation workflows
- Higher fund recovery rates with more accurate detection
- Automation of data sharing among stakeholders improves whole ecosystem's fraud detection capabilities



GraphAI Solutions Overview

	Solution	Required Input	Output	Objective
1	**Case Validation** Post Settlement	Incident id, Transaction data. For training: mule labels, additional labels/metrics on money trails (optional)	Case Validity Score	Validate if a reported fraud is fraud and not a dispute, misreported fraud, ...
2	**Case Prioritization** Post Settlement	Incident id, Transaction data. For training: mule labels, KPIs	Case Priority Score	Rank Cases according to KPIs so that right cases are worked on first.
3	**Case Allocation** Post Settlement	Incident id, Mule Account Score	Case officer ID	Cases are allocated to officers that have worked on related cases to increase efficiency
4	**Account Filtering** Post Settlement	Incident id, Transaction data. For training: mule labels	Mule Account Score	Prioritize mule investigation on a case. Filter accounts in large cases.
5	**Incident, Mule and Victim Detection** Post Settlement	Incident id, Transaction data. For training: mule (5.1, 5.2) and victim labels (5.3)	5.1 Transaction Fraud Score 5.2 Mule Account Score 5.3 Victim Account Score	Populate and update/maintain a mule database, discover possible unreported victims
6	**Fraud Detection** Pre Settlement	Transaction data. For training: mule labels	6.1 Transaction Risk Score 6.2 Account Risk Score 6.3 Behavioral features 6.4 Graph features	Provide participants scores and features from industry level data to embed in their own models and decision making

4 Data Management Components

National Fraud Portal Data Hub

The NFP Data Hub is comprised of:

1. a database for storing transactions
2. a database for registering known or suspected mules (and associated mule scores)
3. an incident database, storing e.g., data related to information available in money trails and case management.

The NFP Data Hub covers both:

- pre-settlement (payment orders), and/or
- post-settlement (settled payments) data

Capabilities

- ingest and process data (in particular, transactions) in real-time and at high volumes (up to thousands per second, equivalent to tens of millions per day)
- interface with standard APIs, including HTTP REST, Apache Kafka or JDBC. These APIs are shared between all relevant stakeholders.
- be set up as a centralized or peer-to-peer system between FIs

NFP Minimal Data Requirements

Money Trails

Payments Data

Payments records covering both 'on-us' and 'off-us' transactions and include:

- Hash of sender/receiver account ID (no customer aggregation needed)
- Payment amount, time & date
- Transaction ID

Fraud Reports

The swift and efficient submission of fraud reports is critical for an effective fraud investigation & detection system

Graph AI Fraud Detection

Payments Data

+

Fraud Activity Labels

Transactions must be tagged with labels indicating whether they are associated with fraudulent activity.

PII Data Not Required

FNA's solution does not require any personally identifiable information (PII) or precise demographic data related to account holders.

Additional Data

Supplementary fields may include:

- Transactional context (location, device used, ...)
- Security flags or alerts raised during the transaction process
- Cash withdrawal, e-commerce transactions, bitcoin transactions
- Telecommunication data

Thank You

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