FRMS UPDATE

“Actio”: Open-Source Transaction Monitoring System

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A REMINDER OF WHY WE BUILT THE FRAUD RISK MANAGEMENT SOLUTION

ACTIO – TRANSACTION MONITORING SYSTEM

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WHY?

Need and purpose.

Because Mojaloop needed anti-fraud, AML, CTF products that work with it?

Well, that's true. But there are other reasons.
(This works with more than Mojaloop)

WHY AN OPEN-SOURCE FRAUD RISK MANAGEMENT SYSTEM?

Fraud is a major issue—and it's getting worse

"With more than 4.5 billion people online, more than half of humanity is at risk of falling victim to cybercrime at any time, requiring a unified and strong response."

Jürgen Stock,
INTERPOL Secretary General

Fraud is expensive for:

- Those who are defrauded
- The system – defending against fraud costs tremendous amount to each player in the ecosystem
- Government, both dealing with their own fraud, and helping others to defend against it.

Impacts of Fraud

- **Human**
- **Government Outcomes**
- **Reputational**
- **Government Systems**
- **Industry**
- **Environmental**
- **Security**
- **Financial**
- **Business**

Based on international estimates, public bodies generally lose between 0.5% and 5% of their spending to fraud and related loss.

The private sector fears reputational impact and does not generally disclose, but according to Merchant Savvy, global losses of payment fraud have tripled to $32.39 billion in 2020 and are expected to continue to cost $40.62 billion in 2027 which is 25% higher than in 2020.

Therefore, the increase in fraud cases restrains the growth of the payments markets and financial inclusion, and this largely ignores informal markets.

Dramatic Cost Savings

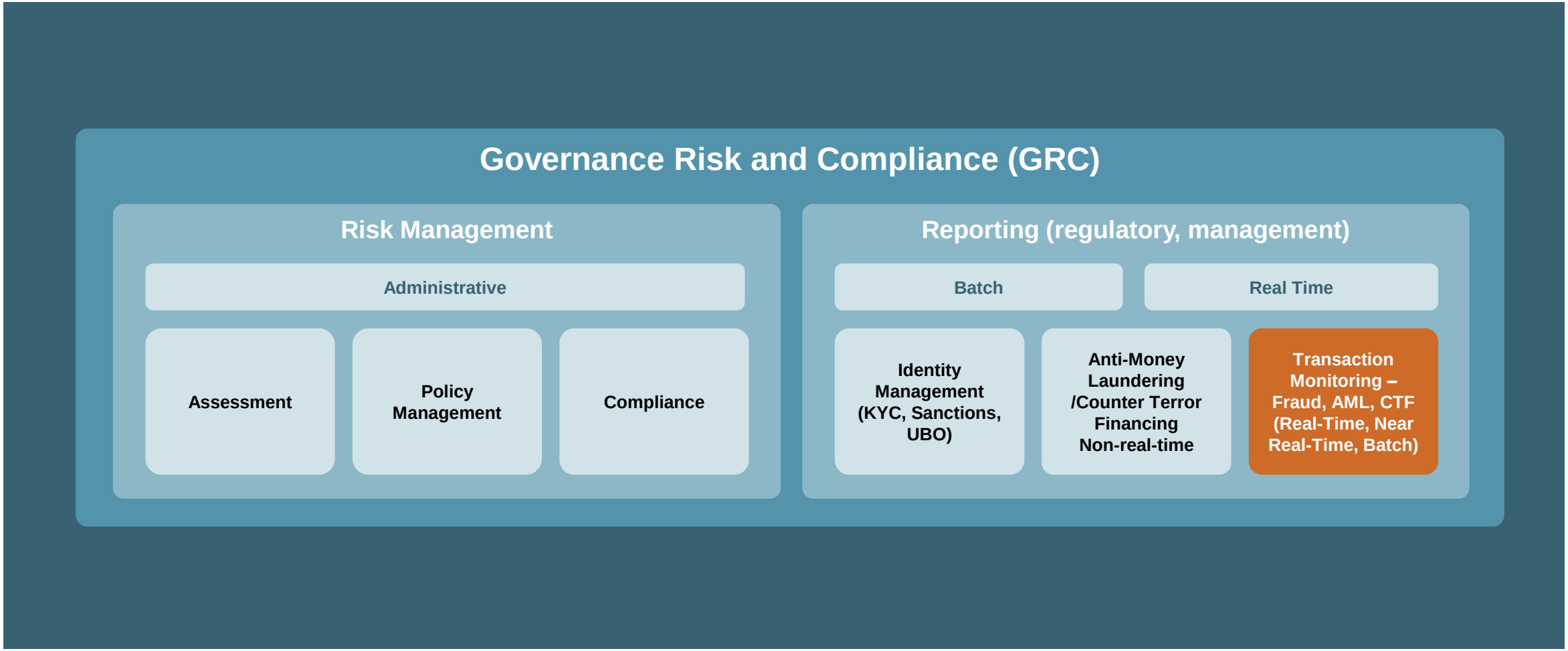
Open source is source code that is made freely available for modification and redistribution. Products include permission to use the source code, design documents, or content of the product. The OSS model is a decentralized software development model that encourages collaboration. A main principle is is peer production, with products such as source code and documentation freely available to the public.

International Public Sector Fraud Forum Guide to Understanding the Total Impact of Fraud February 2929

A SPECIFIC NEED FOR FINANCIAL INSTITUTIONS

- Budgets are limited, needs are high.
- Smaller organizations are frequently forced to “make do” with what they have or solutions that are sub par.
- Significant barrier to entry for start ups and those focusing on financial inclusion.
- Transactional monitoring systems are expensive because they are hard
  - To build and hard
  - To implement
- We have significantly reduced the Total Cost of Ownership by providing an Open-Source Solution.

FRAUD RISK MANAGEMENT SYSTEM LANDSCAPE



ACTIO OSS TRANSACTION MONITORING SYSTEM: HIGH LEVEL DESCRIPTION

An Open-Source Solution for Fraud and Risk Management

- Includes the 30+ highest-priority fraud typologies
- Implementable by DFSPs, Software Publisher and payment networks
- Designed for low-cost operation
- Designed to scale up and down to suit needs and costs

This is the Transaction Monitoring System

The most difficult component

(real-time capabilities, many moving parts, integration with other systems)

It works in concert with other components of a comprehensive fraud program

KYC/UBO, Investigation, GRC Programs

HOW IT WORKS A REMINDER

Scales up
to run as country-wide payment switches, banks, or payment networks

Scales down
to run in the smallest and most limited of situations

An Engine Only

Designed to be used by anyone and modified for their own needs or as the plumbing of a solution offered by a commercial entity.

API driven

Highly configurable by Json message

Modular and adapter driven both for data/events in and data/events out to the line of business systems and case management system

Low cost and Open Source.

Payment switches resell to your FSPs for additional revenue streams.

Payment switches leverage data sharing for better fraud decisions.

**** Embed the Actio Solution into your environment, customizing to your needs**

STATUS UPDATES:

2

ACCOMPLISHED

Completed to date

Not Everything

We've

Been Busy

1. MVP Complete April
2. FRMS CoE "Theoretically Created"
3. Implementation of Neutral Systems for
    A. Documentation
    B. Code
    C. Access Control Defined
4. Completion of conversion to CoE Neutral Systems
5. Approved Messaging
6. Planning of Convening for potential testers
7. Identification of potential early adopters
    A. One Commercial Fork Already with customers.
8. The great UX debate
    A. Created 1 OSS CMS Integration
    B. Sybrin to allow evaluators and testers to use their more complete UX

TO DO

Some of what there is to do …

Not Everything

There Will

Be More

1. Underway, what OSS Group do we fall under?
2. Creation of the actual Center of Excellence, governance et al
3. Funding partnerships actively being sought
4. Initial Implementations
    A. Potentials So far – 5
5. Performance Case Study
6. Potential Guidebooks
    1. How to implement, Analysis and Typologies
    2. Typology accuracy testing with FCA Synthetic and Real Data
7. Match Implementations Needs to Product Roadmap (and Build)
8. Refinement of mission based on market and funder inputs
9. Much later in the year look for synergies
    A. Consumer Protection Mappings
    B. To support Regulators

TECHNICAL DELIVERABLES

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DELIVERABLES

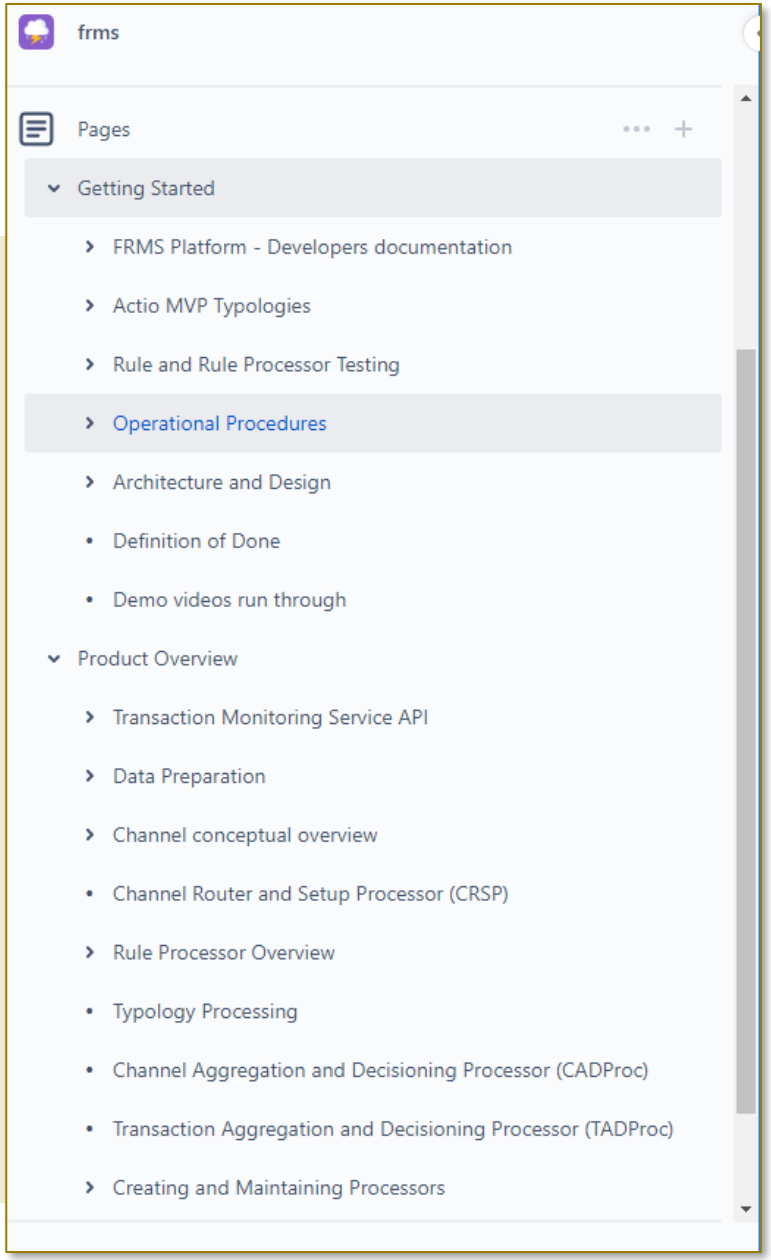
Create FRMS CoE

Implementation of the FRMS CoE, Systems, Governance, Access Control:

- Create neutral CoE for FRMS code repositories - https://github.com/FRMSCoE
- Create neutral CoE for FRMS document repositories - https://frmscoe.atlassian.net/wiki/home
- Create neutral CoE for FRMS CI/CD pipeline
- Define operational procedures
- Creation of the Payment Platform Adapter for Mojaloop
- Integrate with 1 OSINT data source for sanctions - FIC
- Integration with Case Management Systems for investigations:
  - Open-source CMS: Nuxeo
  - Commercial CMS: Sybrin

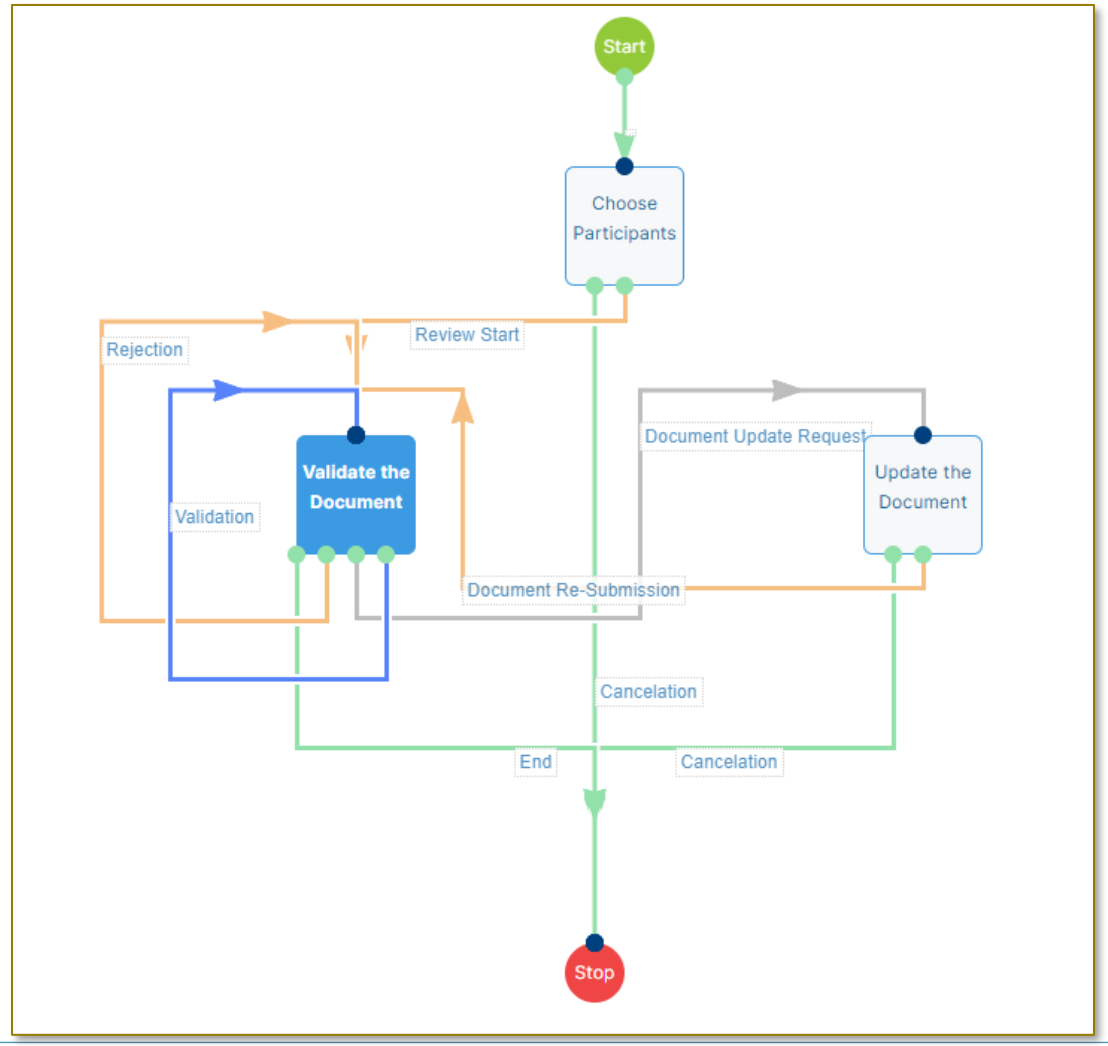
On-boarding:

- Thitsaworks, Glenbrook, Mifos and Converge Solutions have all shown interest and has been on-boarded to the new CoE controlled repositories



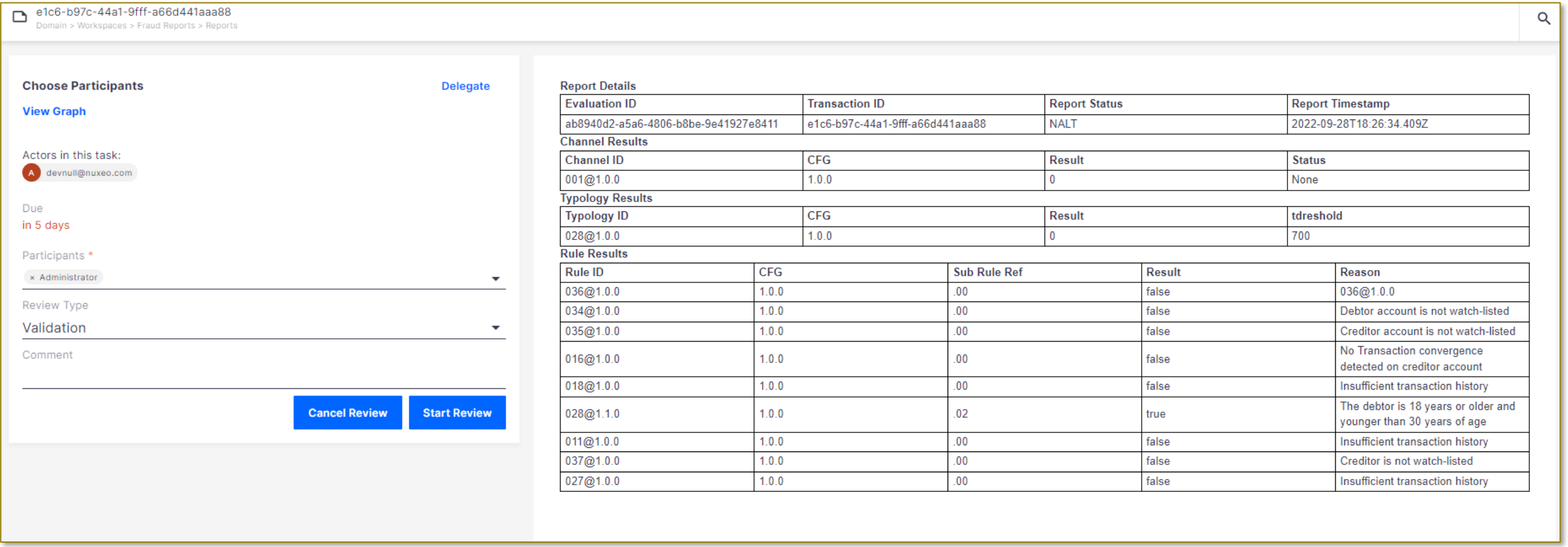
INVESTIGATION FLOW

Nuxeo OSS Case Management



ASSIGN PARTICIPANTS

Nuxeo OSS Case Management



Report Details

Evaluation ID	Transaction ID	Report Status	Report Timestamp
ab8940d2-a5a6-4806-b8be-9e41927e8411	e1c6-b97c-44a1-9fff-a66d441aaa88	NALT	2022-09-28T18:26:34.409Z

Channel Results

Channel ID	CFG	Result	Status
001@1.0.0	1.0.0	0	None

Typology Results

Typology ID	CFG	Result	tdreshold
028@1.0.0	1.0.0	0	700

Rule Results

Rule ID	CFG	Sub Rule Ref	Result	Reason
036@1.0.0	1.0.0	.00	false	036@1.0.0
034@1.0.0	1.0.0	.00	false	Debtor account is not watch-listed
035@1.0.0	1.0.0	.00	false	Creditor account is not watch-listed
016@1.0.0	1.0.0	.00	false	No Transaction convergence detected on creditor account
018@1.0.0	1.0.0	.00	false	Insufficient transaction history
028@1.1.0	1.0.0	.02	true	The debtor is 18 years or older and younger than 30 years of age
011@1.0.0	1.0.0	.00	false	Insufficient transaction history
037@1.0.0	1.0.0	.00	false	Creditor is not watch-listed
027@1.0.0	1.0.0	.00	false	Insufficient transaction history

INVESTIGATE

Nuxeo OSS Case Management

e1c6-b97c-44a1-9fff-a66d441aaa88

Domain > Workspaces > Fraud Reports > Reports

Validate the Document Reassign Delegate

View Graph

Actors in this task:

A devnull@nuxeo.com

Due

in 5 days

Participants A Administrator

Initiator Comment

Comment

Tris transaction triggered no rules, thus is not fraudulent.

Reject Validate

Report Details

Evaluation ID	Transaction ID	Report Status	Report Timestamp
ab8940d2-a5a6-4806-b8be-9e41927e8411	e1c6-b97c-44a1-9fff-a66d441aaa88	NALT	2022-09-28T18:26:34.409Z

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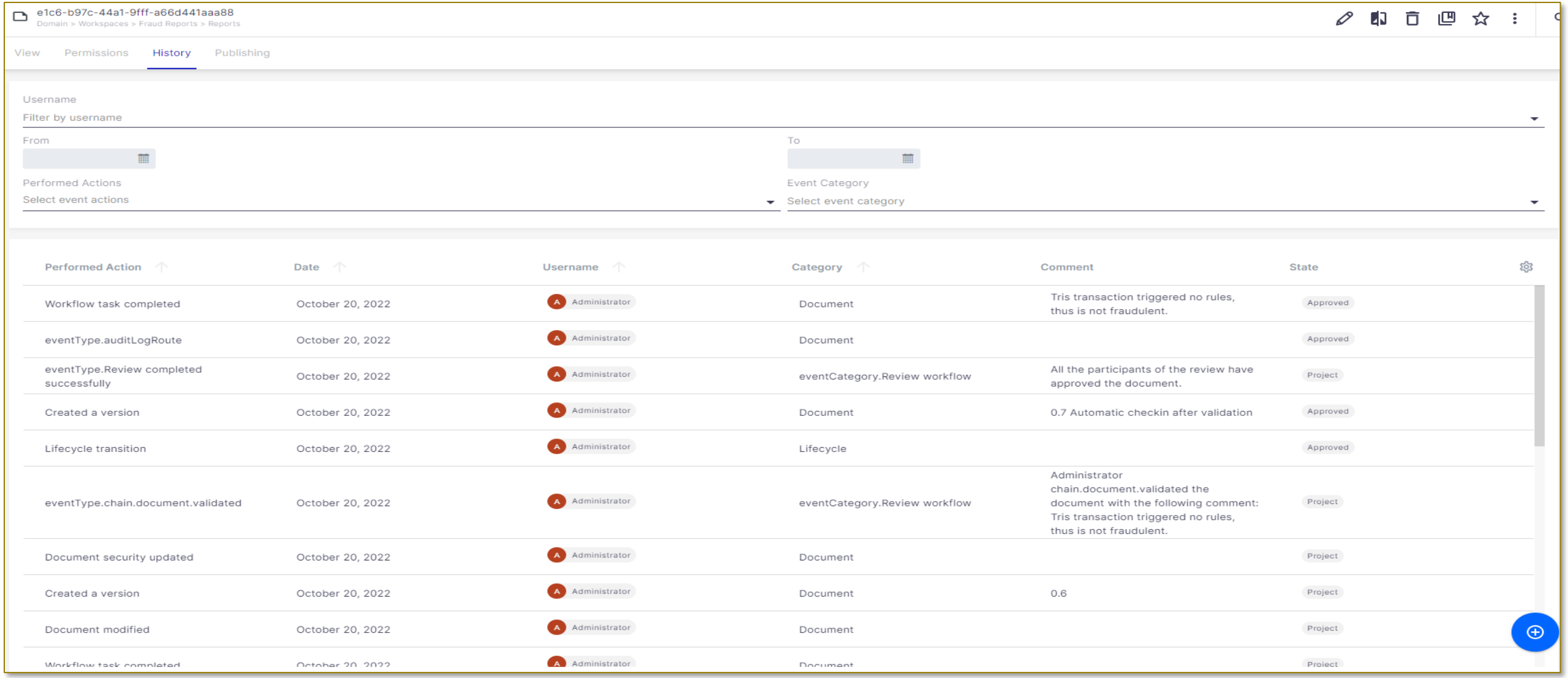
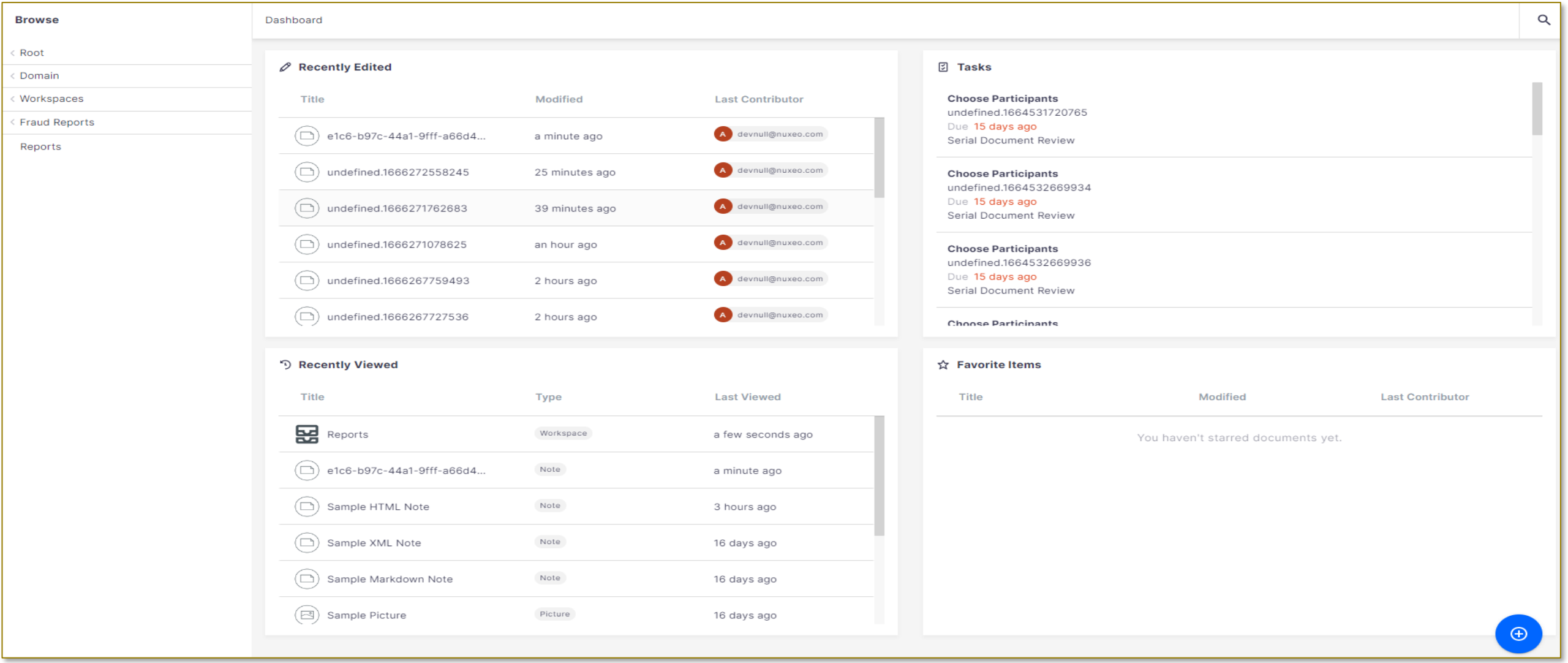
CASE HISTORY

Nuxeo OSS Case Management



DASHBOARD

Nuxeo OSS Case Management



WHAT'S NEXT - PERFORMANCE

Performance benchmark

1. Optimizations
2. Scale up components - Nifi, Arango (from standalone to cluster), Redis, ELK (convert to cluster deployment)
3. Performance testing (run performance test at scale to aim to achieve 3000 tps)
4. Benchmark
   - Requirements for 3000 tps
   - Minimum spec required to run Platform
   - Cost / cloud requirement Estimate per 1k tps (eg 1k, 2k, 3k)
   - Propose optimized infrastructure architecture document for > 3k tps
   - Scaling of processors in OpenFaas (force up / down scaling of a processor)
   - System sizing-related performance - Costs for 3000 tps & Minimum cost
5. Endurance test
   - A 3 day real world scenario, that fluctuates the load e.g. (Idle at 50 TPS, medium load of 800 TPS, and peak load of 3,000 TPS)
   - Ability to provide a short and repeatable test scenario demonstrating the performance metrics.
   - Create test data that will contain representative volumes of fraud for each typology. Ideally reach a 1% fraud rate triggering the different typologies on a repeating dataset of ~10 000 transactions

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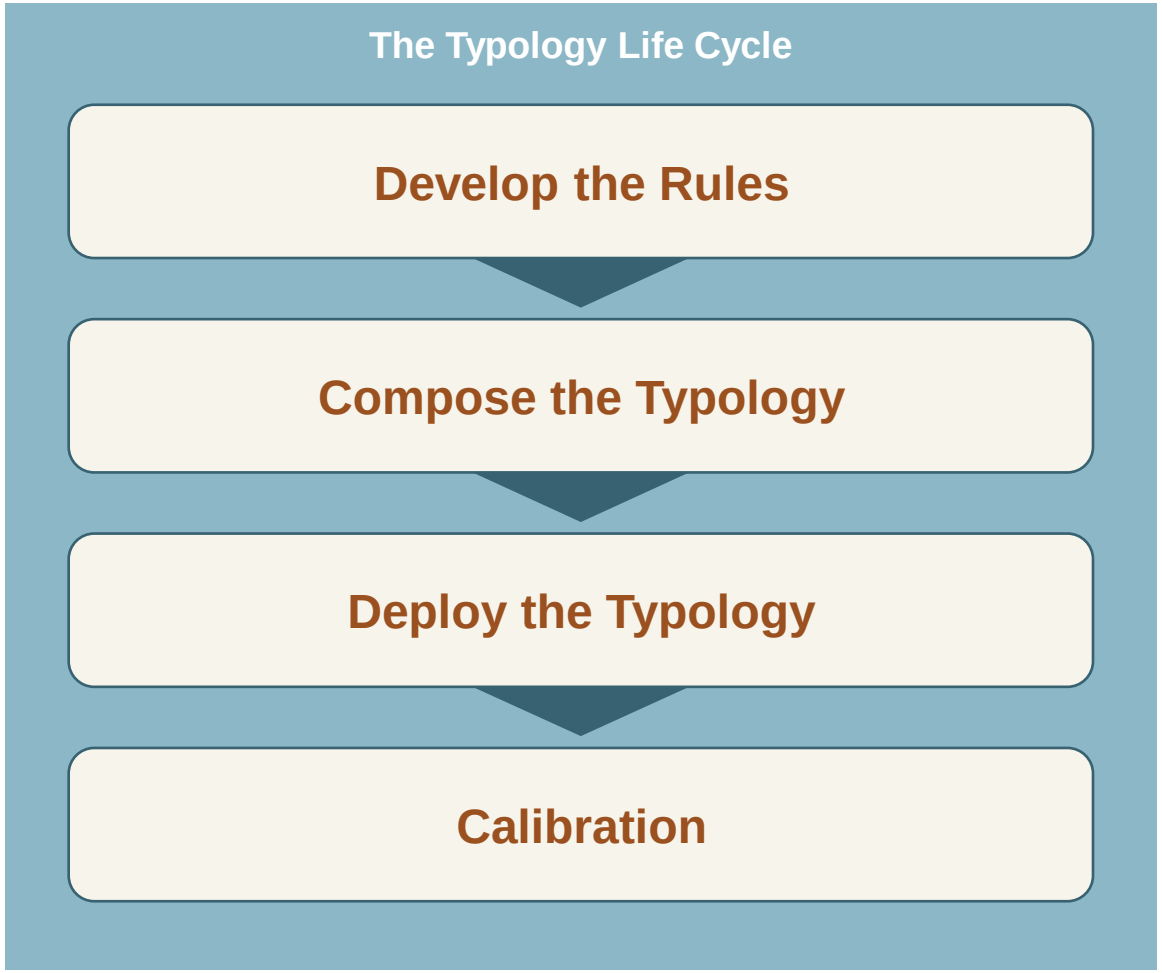
TYPOLOGIES – PATTERNS OF FRAUD



Example: Typology No. 28, Scams	
003@1.1.0	Account Dormancy - Creditor
008@1.0.0	Outgoing Transfer Similarity - Creditor
010@1.0.0	Increased Account Activity - Debtor
011@1.0.0	Increased Account Activity - Creditor
016@1.0.0	Transaction Convergence - Creditor
018@1.0.0	Exceptionally Large Outgoing Transfer
021@1.0.0	A Large Number of Similar Transaction Amounts - Creditor
025@1.0.0	Aggregated Transaction Mirroring
027@1.0.0	Immediate Transaction Mirroring
028@1.1.0	Debtor age
030@1.0.0	New Creditor transfer
034@1.0.0	Watch-listed account - Debtor
035@1.0.0	Watch-listed account - Creditor
036@1.0.0	Watch-listed party - debtor
037@1.0.0	Watch-listed party - creditor
048@1.0.0	Large transaction amount vs history - Debtor
063@1.0.0	Synthetic data check - Benford's Law - Creditor

A USER STORY

Users act, rules are assessed, and you look for patterns of fraud, or typologies.

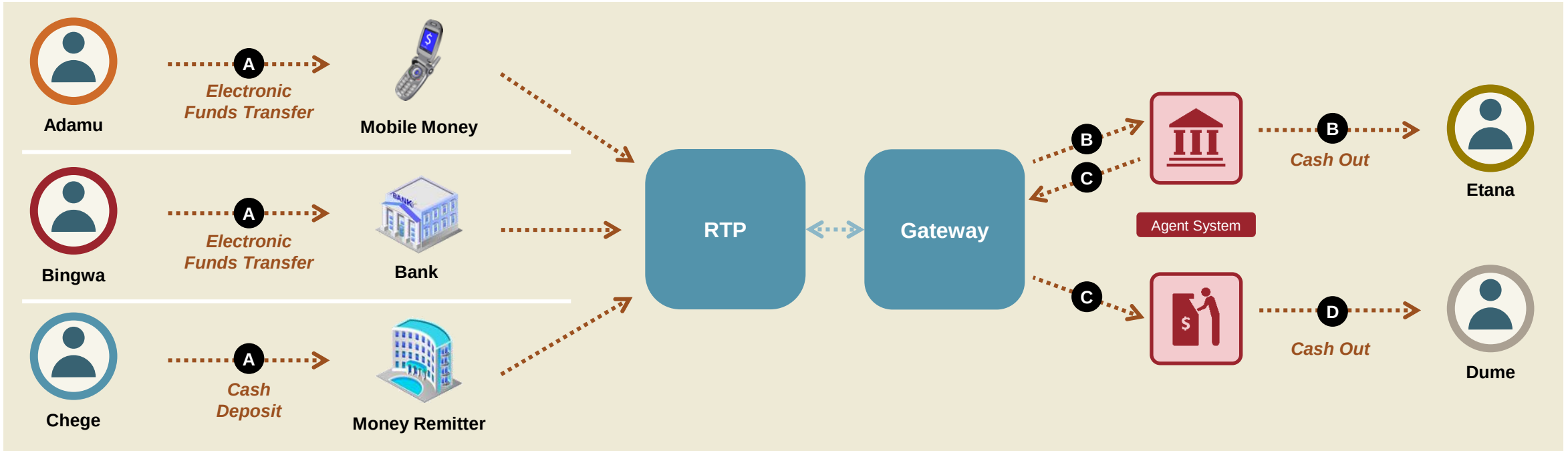
Etana convinces Adamu, Bingwa and Chege that they'd won a prize and need to pay a small administration fee to process their winnings.

A. They each transfer the money to Etana's account. (Amounts are very similar for each transaction).

B. As each payment arrives, Etana immediately cashes out the payment.

C. Adamu's payment arrives after the money agent has closed for the day so Etana immediately transfers his payment to her associate, Dume.

D. Dume cashes out the payment first thing the next morning.



DO THE ACTIONS SHOW A PATTERN OF FRAUD?

Typology	Rules			Alert
Example **Typology 28: False promotions, phishing, or social engineering scams.** *(e.g. fraudsters impersonating providers and advising customers that they have won a prize in a promotion and to send money to the fraudster's number to claim the prize).*	003@1.1.0	Account Dormancy - Creditor	X	! Enough Rules were Broken that a Fraud Alert was Triggered
	008@1.0.0	Outgoing Transfer Similarity - Creditor	X	
	010@1.0.0	Increased Account Activity - Debtor		
	011@1.0.0	Increased Account Activity - Creditor	X	
	016@1.0.0	Transaction Convergence - Creditor		
	018@1.0.0	Exceptionally Large Outgoing Transfer		
	021@1.0.0	A Large Number of Similar Transaction Amounts - Creditor	X	
	025@1.0.0	Aggregated Transaction Mirroring	X	
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