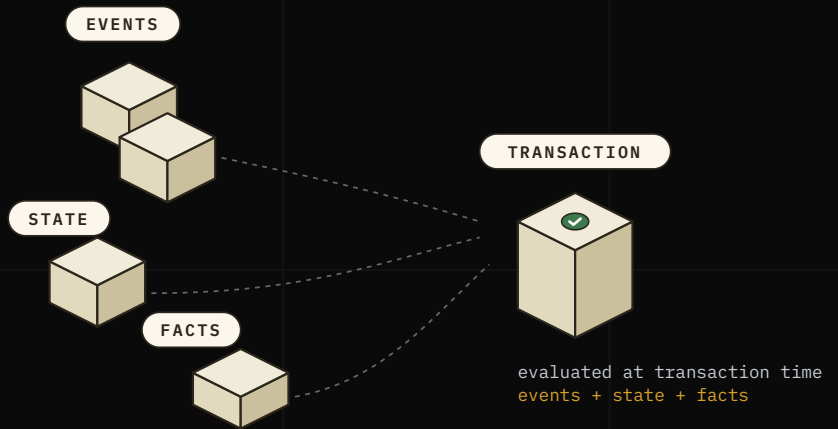




TECHNICAL BRIEF · OCTOBER 2025

Three surfaces. One explainable decision.

Implementing event stream plus state snapshot intelligence with Loci: a minimal, composable data model and an initial baseline of 12 explainable controls, ready for regulatory-grade deployment.



Implementing Event + State Intelligence with Loci

This brief describes how the recommended event stream plus state snapshot strategy is implemented in practice using Loci's composable infrastructure, and outlines an initial baseline control set suitable for regulatory-grade deployment. It translates the strategy into concrete implementation guidance, while remaining readable to senior technical, risk, and compliance leaders.

THE OBJECTIVE

Not maximum coverage on day one, but strong baseline controls, explainability and auditability, low operational overhead, and a foundation that can evolve.

Loci implements this strategy by evaluating **every transaction** as the primary decision event, *enriched* by two complementary intelligence layers: recent events and current state.

ENTITY_EVENTS

What just happened. Append-only, time-ordered, high-signal and low-volume. Used for velocity checks, sequence detection, and cross-channel correlation.

ENTITY_STATE

What is currently true. One row per entity, updated on change or scheduled refresh, deterministic and explainable. Used for lifecycle conditions, thresholds, eligibility and constraints.

ENTITY_FACTS

Derived, computed facts. Aggregates, rolling windows, network and behavioral summaries. Used for deviation detection, structuring, historical baselines.

TRANSACTION

The decision anchor. Every decision in Loci is anchored on a transaction event, enriched by the other three surfaces at decision time.

Custom data model design

Loci's implementation does not prescribe a rigid schema. Instead, it recommends a **minimal, composable data model** that supports regulatory-grade controls while keeping operational overhead low. The model is intentionally separated into **four logical surfaces**, each with a clear responsibility.

Four logical surfaces

entity_events · purpose: temporal reasoning and sequencing

COLUMN	DESCRIPTION
entity_id	Account / customer identifier
event_type	login, password_reset, beneficiary_add, etc.
event_timestamp	Event time
channel	web, mobile, api
metadata_key / metadata_value	Optional classifier and value

entity_state · purpose: baseline truth at decision time

COLUMN	DESCRIPTION
entity_id	Account / customer identifier
lifecycle_state	new, active, dormant, reactivated
last_activity_at	Most recent activity timestamp
is_kyc_verified	Boolean
risk_tier	Low / Medium / High
country_of_residence	ISO country
updated_at	State refresh time

entity_facts · purpose: statistical and behavioral context

COLUMN	DESCRIPTION
entity_id	Account / customer identifier
fact_type	avg_txn_30d, tx_count_1h, stddev_14d
fact_value	Numeric or boolean
window	1h, 24h, 7d, 30d
computed_at	Last computation time

The baseline composable set: 12 controls

HOW FLM USES THESE TABLES

Every FLM control may read events for recent behavior, state for eligibility and constraints, and facts for deviation and pattern detection. All three are evaluated at transaction time by MADIE, producing a single, explainable decision.

The following controls provide **broad regulatory coverage** while remaining operationally lightweight.

#	CONTROL	CATEGORY	INTELLIGENCE LAYER
1	Dormant-to-Active Reactivation	Lifecycle Risk	State + Events
2	Dormant Account High-Velocity Transfers	Lifecycle + Velocity	State + Events
3	Single Transaction Upper Threshold	Threshold Control	State
4	Weekly Aggregate Value Threshold	Threshold Control	Facts
5	Monthly Aggregate Volume Threshold	Threshold Control	Facts
6	Rapid Beneficiary Addition + Transfer	Sequencing	Events
7	Historical Amount Deviation	Behavioral Deviation	Facts
8	Structuring via Low Variance Amounts	Layering / Structuring	Facts
9	High Velocity Outbound Transfers	Velocity	Events
10	Pass-Through Behavior Detection	Mule / Pass-through	Facts
11	New Account Early High-Value Activity	Lifecycle Risk	State + Facts
12	Geo or Channel Inconsistency	Contextual Risk	State + Events

Control categories

Lifecycle Risk

Dormancy, reactivation, early-account behavior

Threshold Controls

Single transaction caps, rolling value and volume limits

Velocity & Sequencing

Bursts, rapid changes preceding transactions

Behavioral Deviation

Statistical outliers, standard deviation breaches

Layering / Structuring

Low dispersion, repetitive amounts, temporal smurfing

Pass-Through Detection

Rapid in-and-out flows, minimal balance retention

■ PHASED ROLLOUT

Phase 1: foundational coverage, day 0-30

Establish immediate regulatory-grade protection with **low operational risk, high explainability, and minimal tuning**. These controls are deterministic, easy to explain to regulators, low false-positive risk, and aligned with baseline AML and fraud expectations.

#	CONTROL	CATEGORY	LAYERS	WHY PHASE 1
1	Single Transaction Upper Threshold	Threshold	Transaction + State	Mandatory baseline; regulator-expected
2	Weekly Aggregate Value Limit	Threshold	Transaction + Facts	Captures volume-based abuse early
3	Monthly Aggregate Volume Limit	Threshold	Transaction + Facts	Long-horizon exposure control
4	Early-Life High-Value Activity	Lifecycle Risk	Transaction + State + Facts	Critical for new accounts
5	Dormant-to-Active Reactivation	Lifecycle Risk	Transaction + State	Strong signal with low ambiguity
6	Rapid Beneficiary Add then Transfer	Sequencing	Transaction + Events	High-risk, easy to justify

PHASE 1 OUTCOME

Strong baseline fraud and AML coverage, immediate regulator confidence, minimal tuning required.

Phase 2: behavioral and network intelligence, day 30-90

Detect **sophisticated, adaptive abuse patterns** that emerge after baseline controls are in place. These controls require behavioral baselines, benefit from historical data, and capture patterns missed by simple thresholds.

#	CONTROL	CATEGORY	LAYERS	WHY PHASE 2
7	Historical Amount Deviation	Behavioral Deviation	Transaction + Facts	Requires baseline history
8	High-Velocity Outbound Transfers	Velocity	Transaction + Events	Benefits from event tuning
9	Dormant Account High-Velocity Activity	Lifecycle + Velocity	Transaction + Events + State	Composite behavior pattern
10	Structuring via Low-Variance Amounts	Layering / Structuring	Transaction + Facts	Statistical signal, needs calibration
11	Pass-Through Behavior Detection	Mule / Pass-Through	Transaction + Facts	Requires flow observation
12	Geo or Channel Inconsistency	Contextual Risk	Transaction + Events + State	Needs contextual baselines

WHY PHASED DEPLOYMENT MATTERS

It avoids early false-positive fatigue, allows data to accumulate naturally, gives teams time to build confidence, and aligns with how regulators expect controls to mature. It also reinforces Loci's core principle: intelligence should grow with the organization.

OPERATIONAL IMPLICATIONS

For compliance teams: clear logic, clear intent, and regulator-friendly explanations. For engineering teams: stable data models, predictable access patterns, and low change cost. For the business: faster time to coverage, lower operational burden, and confidence at scale. New controls can be added without refactoring data models, and existing controls remain stable as the system evolves.

Closing

This approach does not attempt to predict every fraud pattern. Instead, it provides a **clean intelligence foundation**, a **regulator-aligned reasoning model**, and a **scalable path forward**.

**Fraud and AML controls become structured intelligence,
not accumulated complexity.**

About Loci

Loci is the intelligence infrastructure for modern finance. Loci empowers every defender, analyst, and enterprise system to operate with confidence, clarity, and adaptive insight. With Loci, everyone becomes

intelligent, and the business achieves compliance without complexity.

SEE IT IN YOUR STACK

A short technical review of your event and state data, then a controlled pilot on the phase 1 controls. Read this brief online at runloci.com/brief/event-state-intelligence.

LOCI FRAUD AI · TECHNICAL BRIEF · OCTOBER 2025

runloci.com · sales@runloci.com