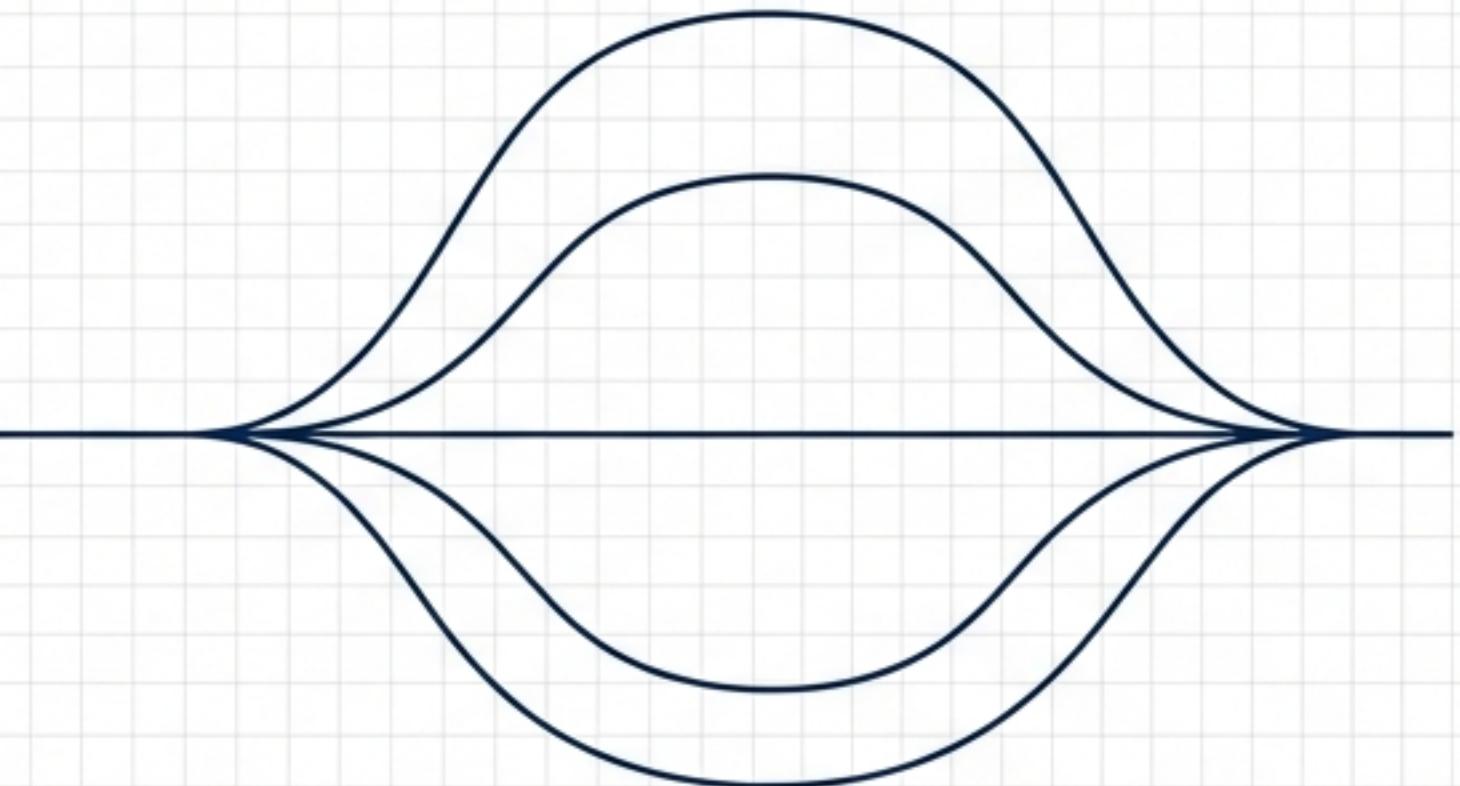


# Dynamic Payment Orchestration AI-Powered Real-Time Rail Selection

PATENT PROPOSAL DECK

CONFIDENTIAL // TECHNICAL EXAMINATION

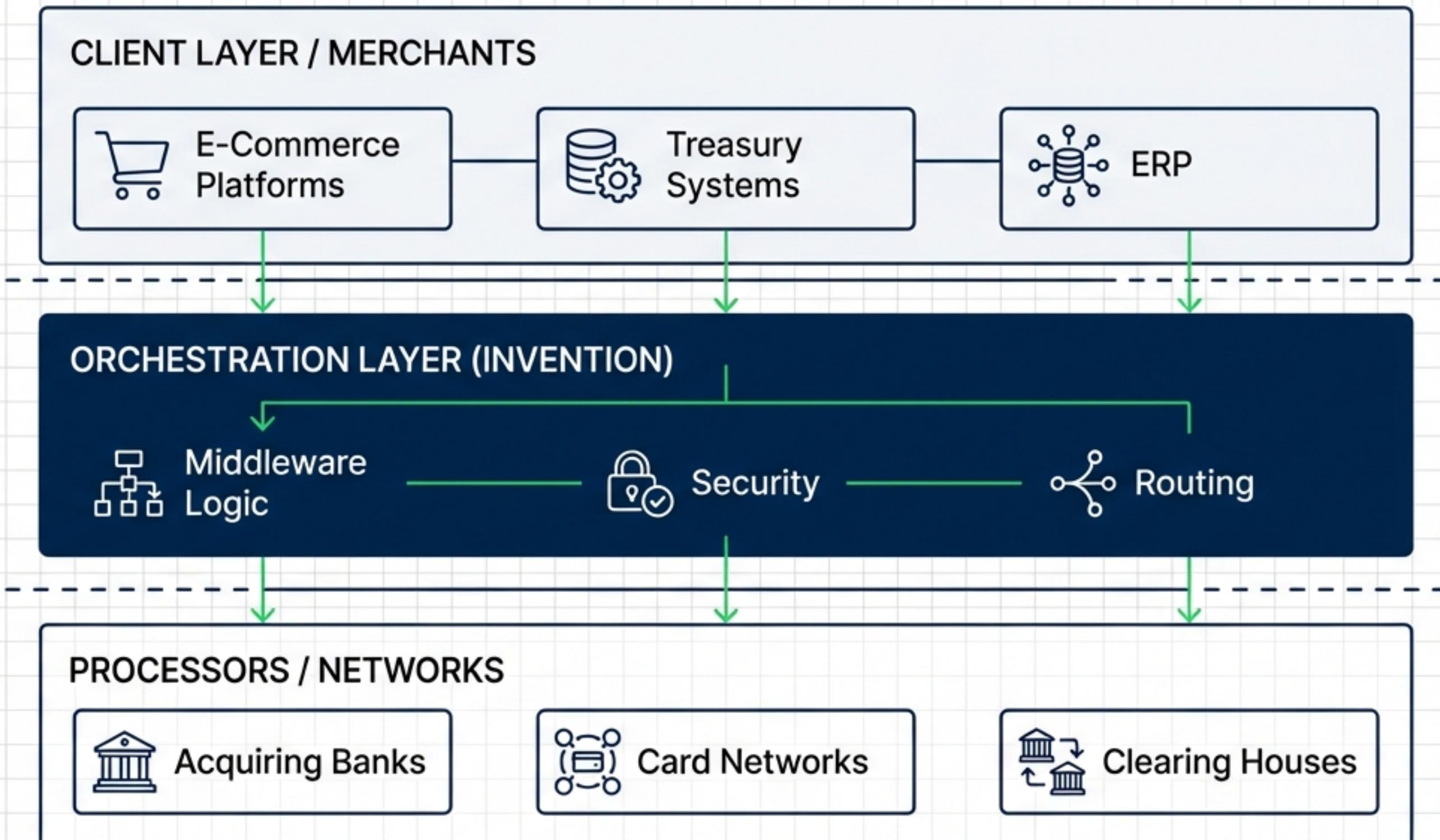


Reducing failures, delays, and inefficiencies  
in multi-rail payment execution.

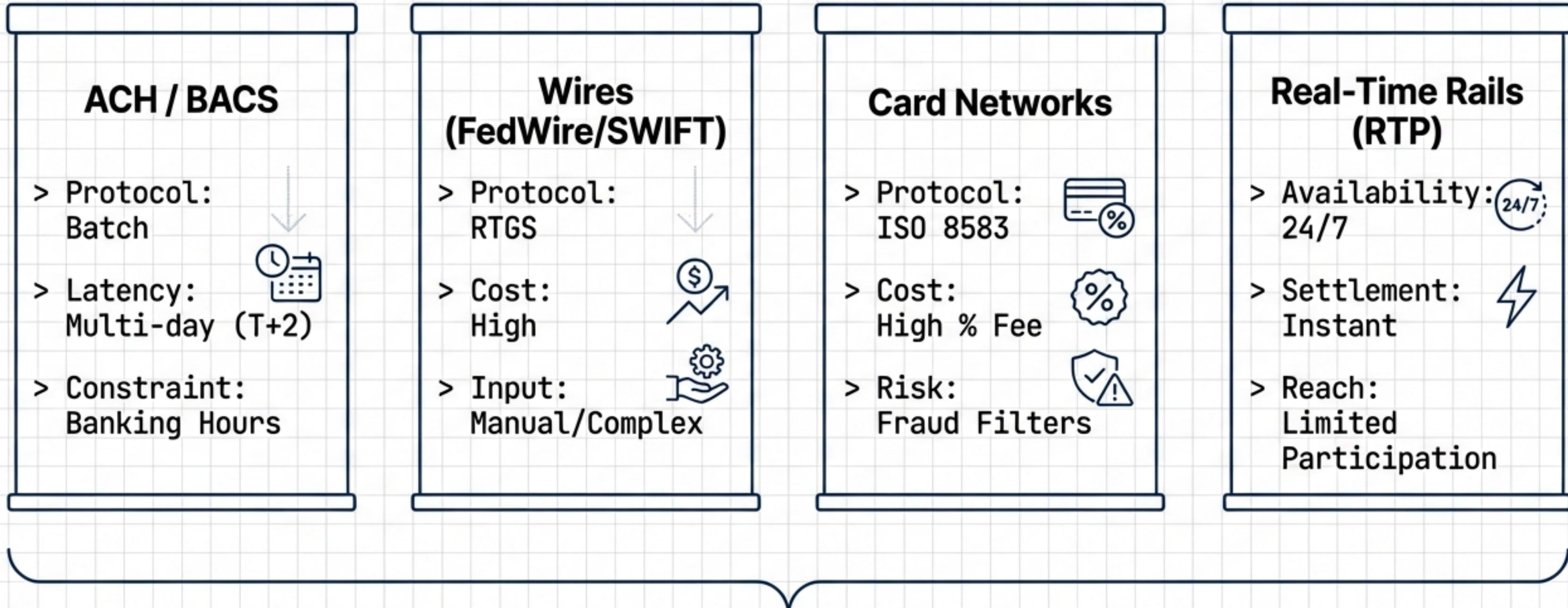
# Field of the Invention & Context

**DOMAIN:** Electronic Fund Transfers (EFT) & Automated Routing.

**SCOPE:** The middleware layer bridging Merchant Core Engines and external PSPs.

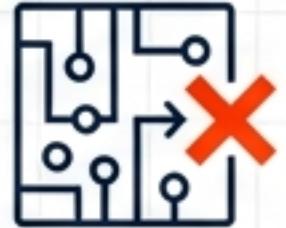


# Background (Prior Art) – The Multi-Rail Ecosystem



**THE INTEROPERABILITY ISSUE:** Fragmented protocols requiring brittle, point-to-point integrations.

# Technical Limitations of Conventional Systems



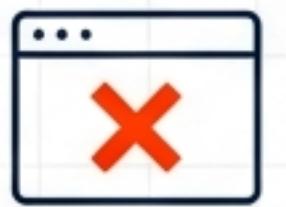
## Static / Rule-Based Routing

Logic limited to rigid if-then statements (e.g., "If Region=US, use Provider A"). Cannot adapt to real-time network degradation.



## Temporal Constraints

Hard dependency on banking windows. Result: Significant downtime during weekends and holidays.



## Generic Error Handling

Systems return binary "Success/Fail" signals without actionable granular data, forcing manual triage.



## Rail Downtime

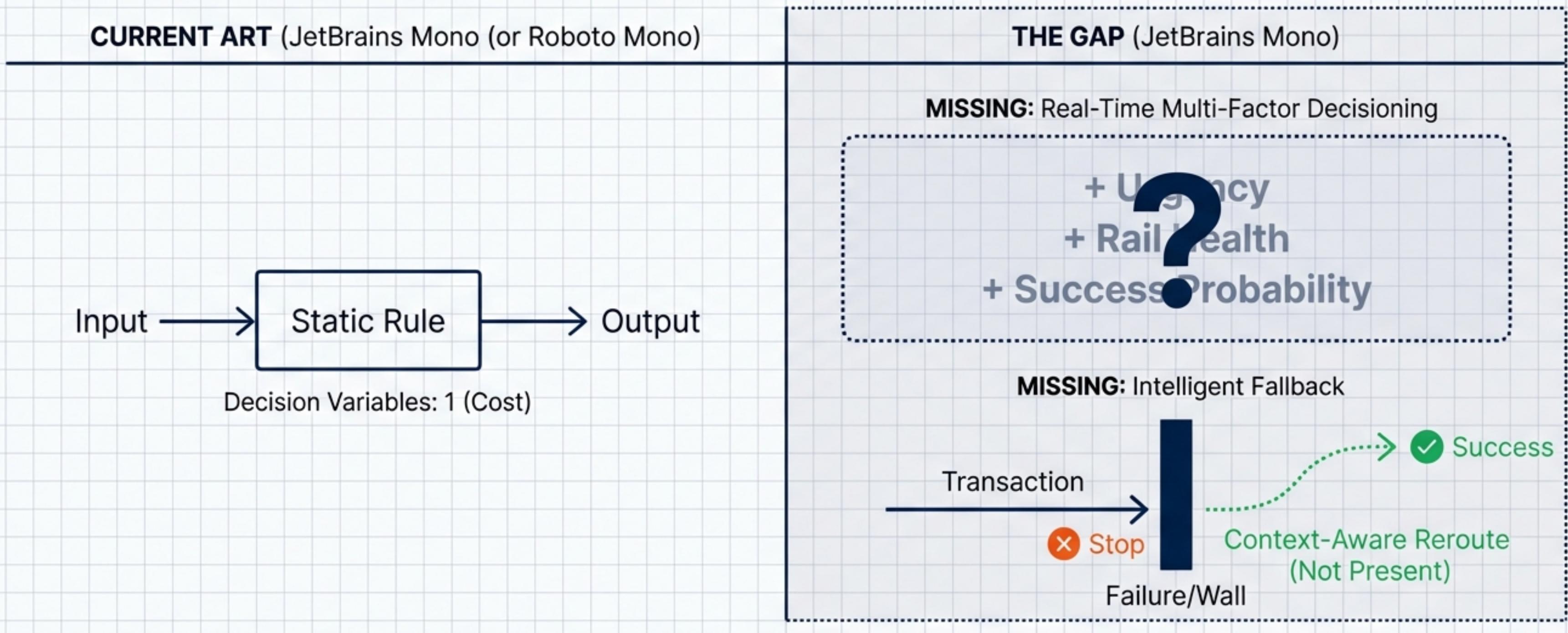
Blind submission to downed networks due to lack of real-time health monitoring.



## Fragmented Ledgers

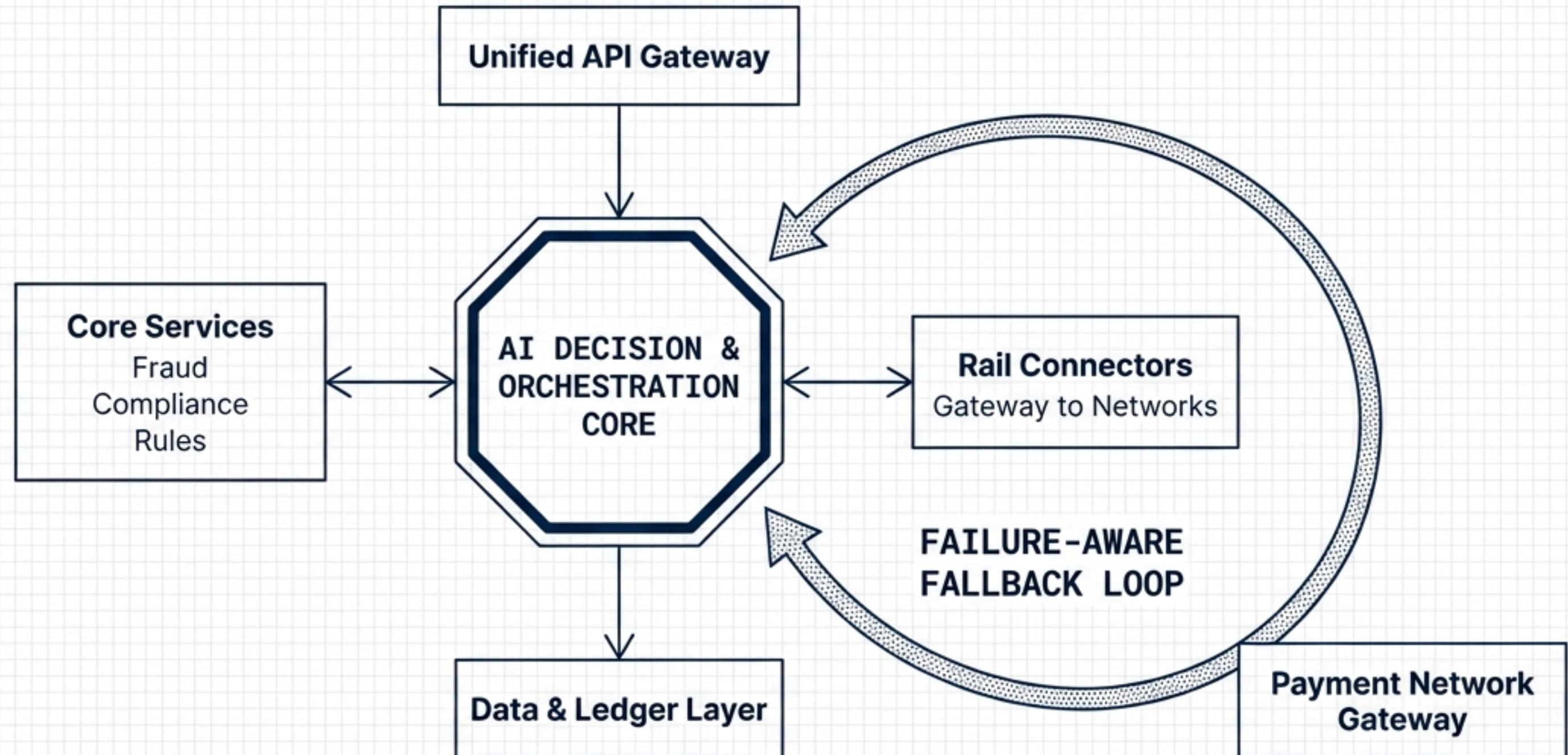
No single source of truth. Reconciliation requires aggregating discordant reports from multiple PSPs.

# The Technical Gap



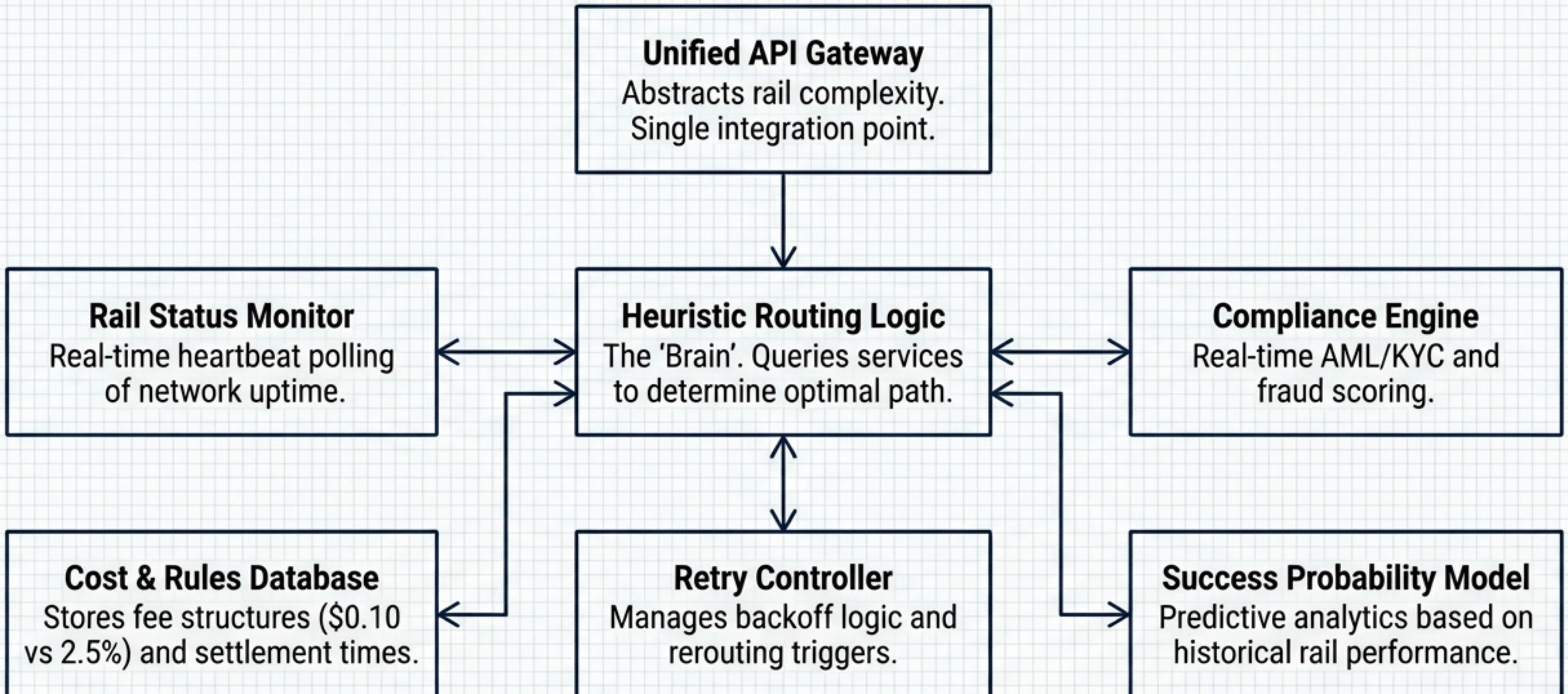
**THE GAP ISSUE:** Lack of real-time, intelligent decisioning and resilient fallback mechanisms creates operational friction and inefficiency.

# Solution Overview – AI-Powered Unified Payments Core

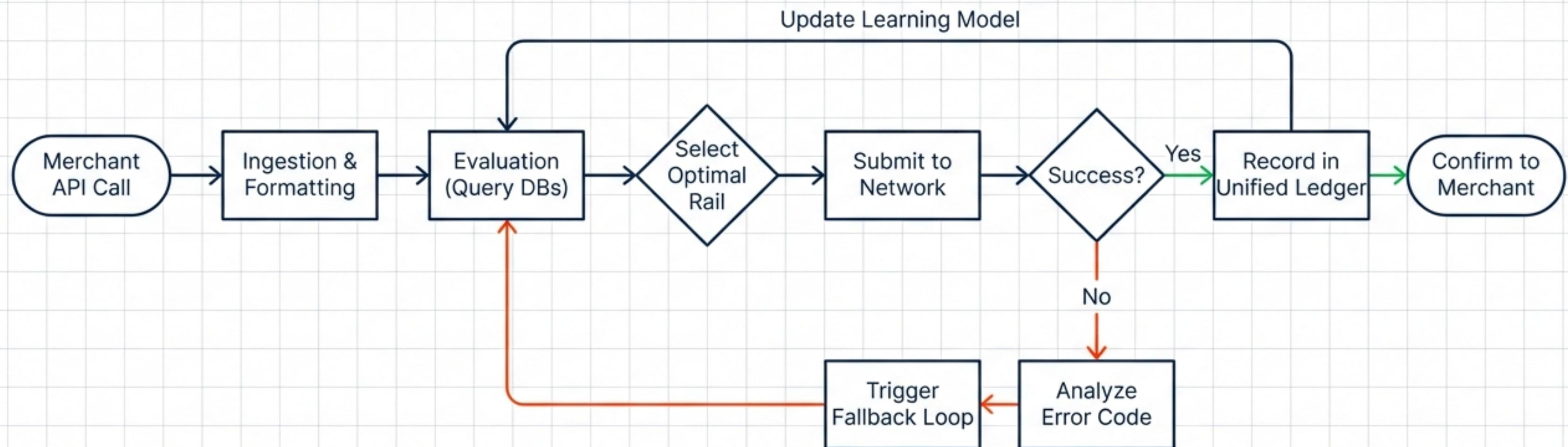


**SYSTEM DEFINITION:** A self-learning orchestration layer acting as a central intelligence hub between business systems and payment networks.

# Core System Components



# Solution Flow Diagram



# Real-Time Scenario (Preferred Embodiment)

MERCHANT: Modern Nest | CUSTOMER: Alex | VALUE: \$450.00 | TIME: Sunday, 22:00

## Timeline / Event Log

### Phase 1: Initial Evaluation (The Logic)

- ACH: [REJECTED] - Reason: Sunday Cutoff
- Wire: [REJECTED] - Reason: Network Down
- Card: [VALID] - Cost: \$11.35 (Expensive)
- RTP: [SELECTED] - Cost: \$0.30 (Instant)

### Phase 2: The Failure (The Incident)

**EXECUTION FAILED.**  
Error Code: AC04 - Account Closed.  
Analysis: Permanent Failure.  
Retry on RTP impossible.

### Phase 3: The Resolution (The Fallback)

**AUTONOMOUSFallback TRIGGERED.**  
New Selection: CARD NETWORK.  
Result: SUCCESS.  
Sale Saved.

# Novelty & Patent Value

**1.**

## **Autonomous Multi-Factor Decisioning**

[Simultaneous analysis of Cost, Speed, Risk, and Rail Health, moving beyond static rule sets.]

**2.**

## **Failure-Reason-Based Rerouting**

[Novel logic distinguishing between transient errors (retry) and permanent errors (AC04 → Reroute).]

**3.**

## **Constraint-Aware Retry Policy**

[Automated adherence to external temporal constraints (banking hours) during the retry phase.]

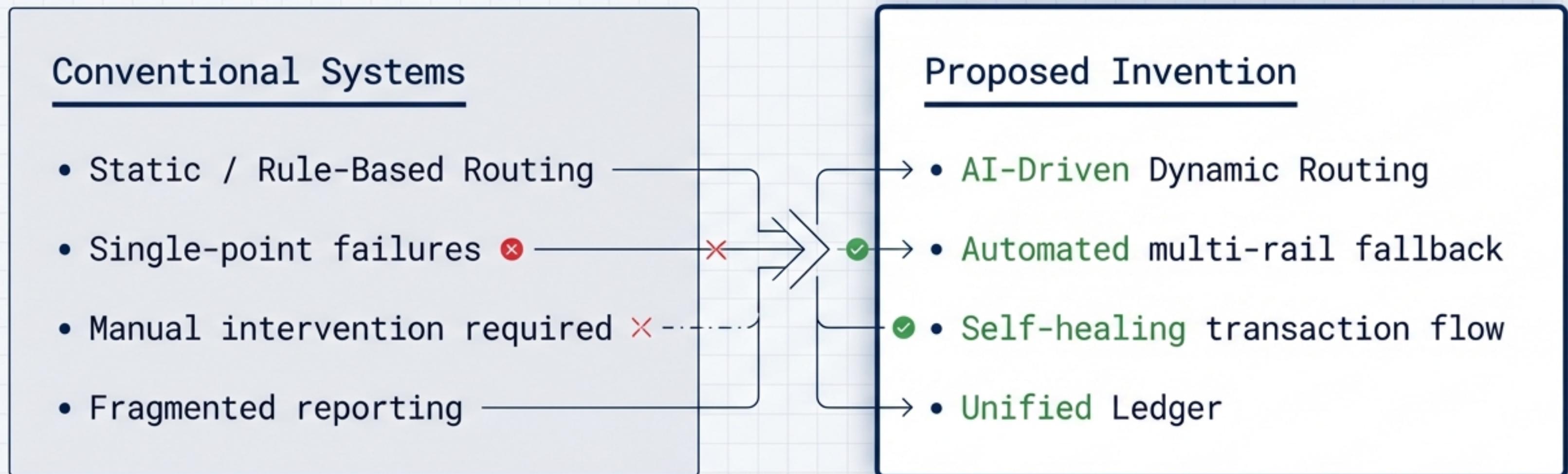
**4.**

## **Self-Learning Feedback Loop**

[System updates predictive models based on specific error codes (e.g., learning a specific account is not RTP-enabled).]

# Summary of Invention Utility

Before and After



TRANSFORMING PAYMENT PROCESSING FROM A MANUAL, BRITTLE  
COLLECTION OF POINT SOLUTIONS INTO A STRATEGIC,  
SOFTWARE-DEFINED, AUTONOMOUS PLATFORM.