

Multi-Agent Systems for Coordinated and Resilience Planning in Petrochemical Supply Chain

ThChE, JUNE 2026

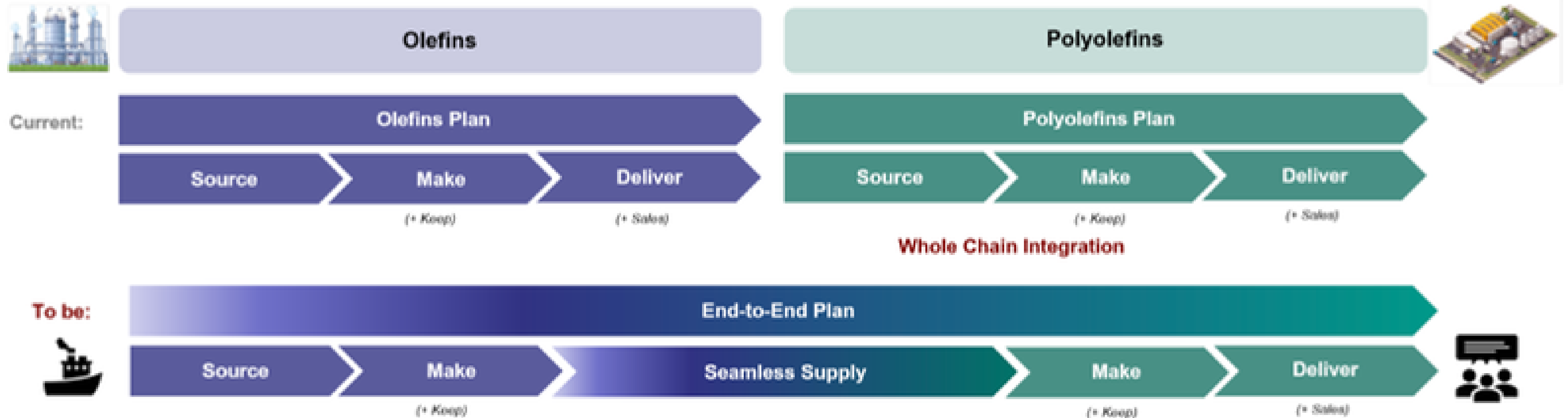


Quantum Technology Foundation (Thailand)

Presented by J. Tangpanitanon

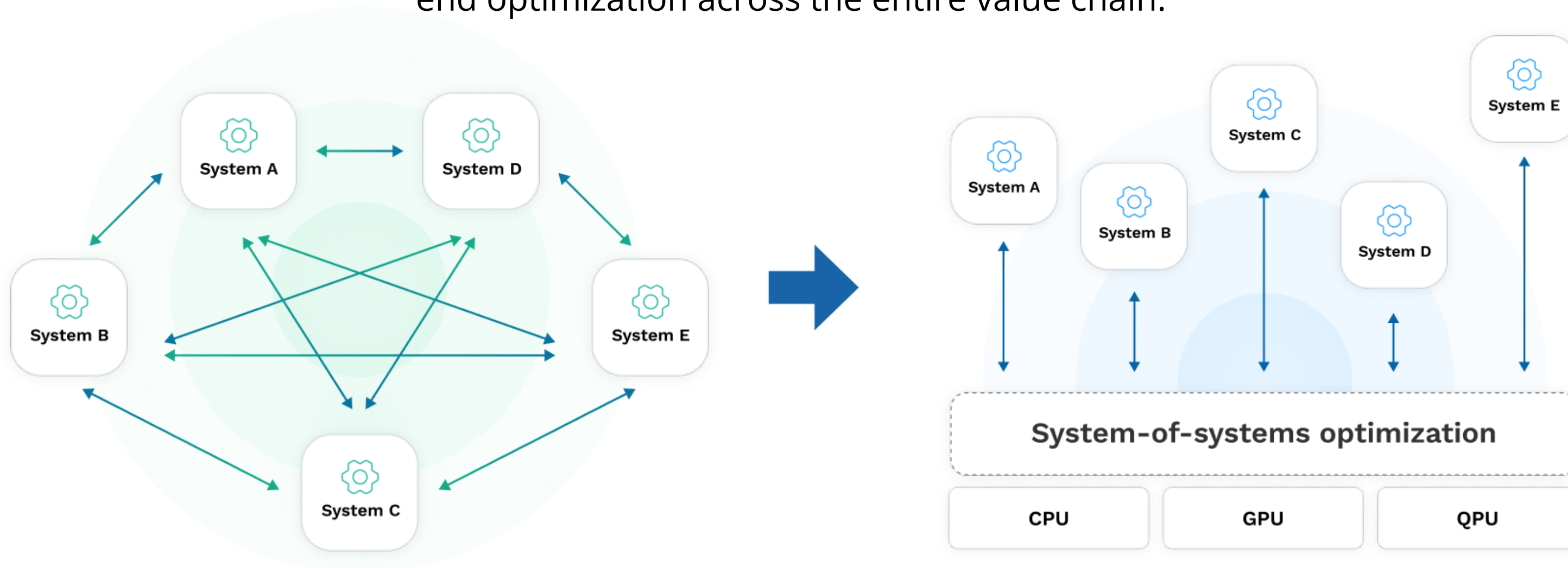
Towards Adaptive Supply Chain with WCI

Seamless integration of Olefins & Polyolefins Supply Chain



From Digital Transformation to Whole Chain Intelligence

Beyond digital and AI transformation lies the challenge of coordination—how to make entire enterprise networks think and act as one. Our Whole Chain Integration (WCI) framework transforms disconnected operations into a unified, intelligent system of systems, achieving continuous, end-to-end optimization across the entire value chain.



Launching of SCGC WCI Project (NOV 2024)

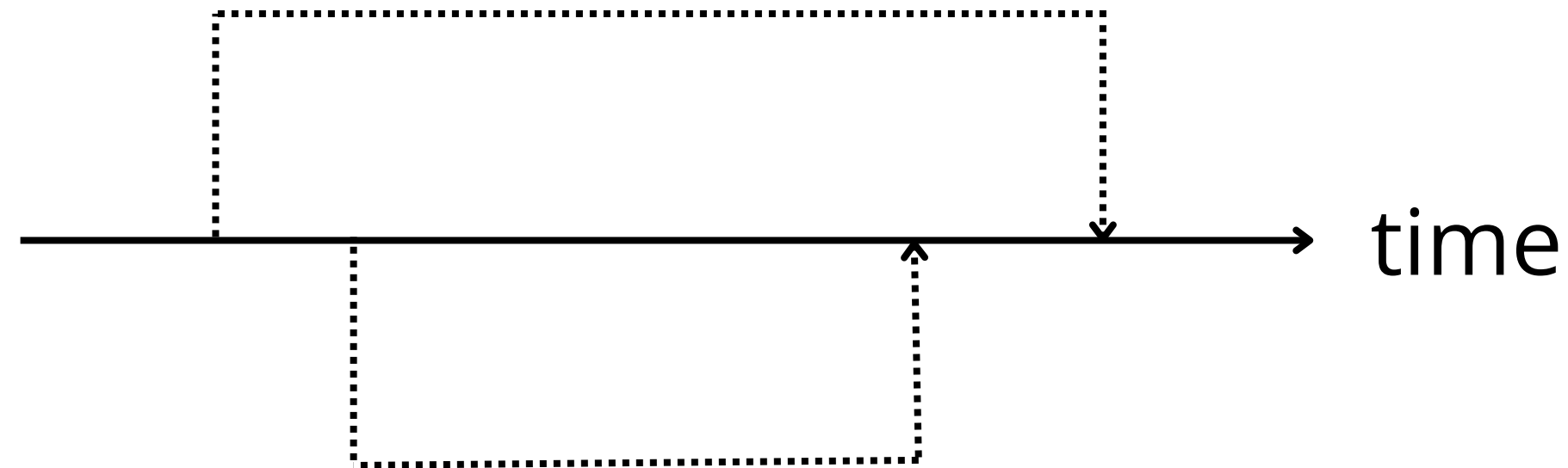
50+ People, 10+ members for working team





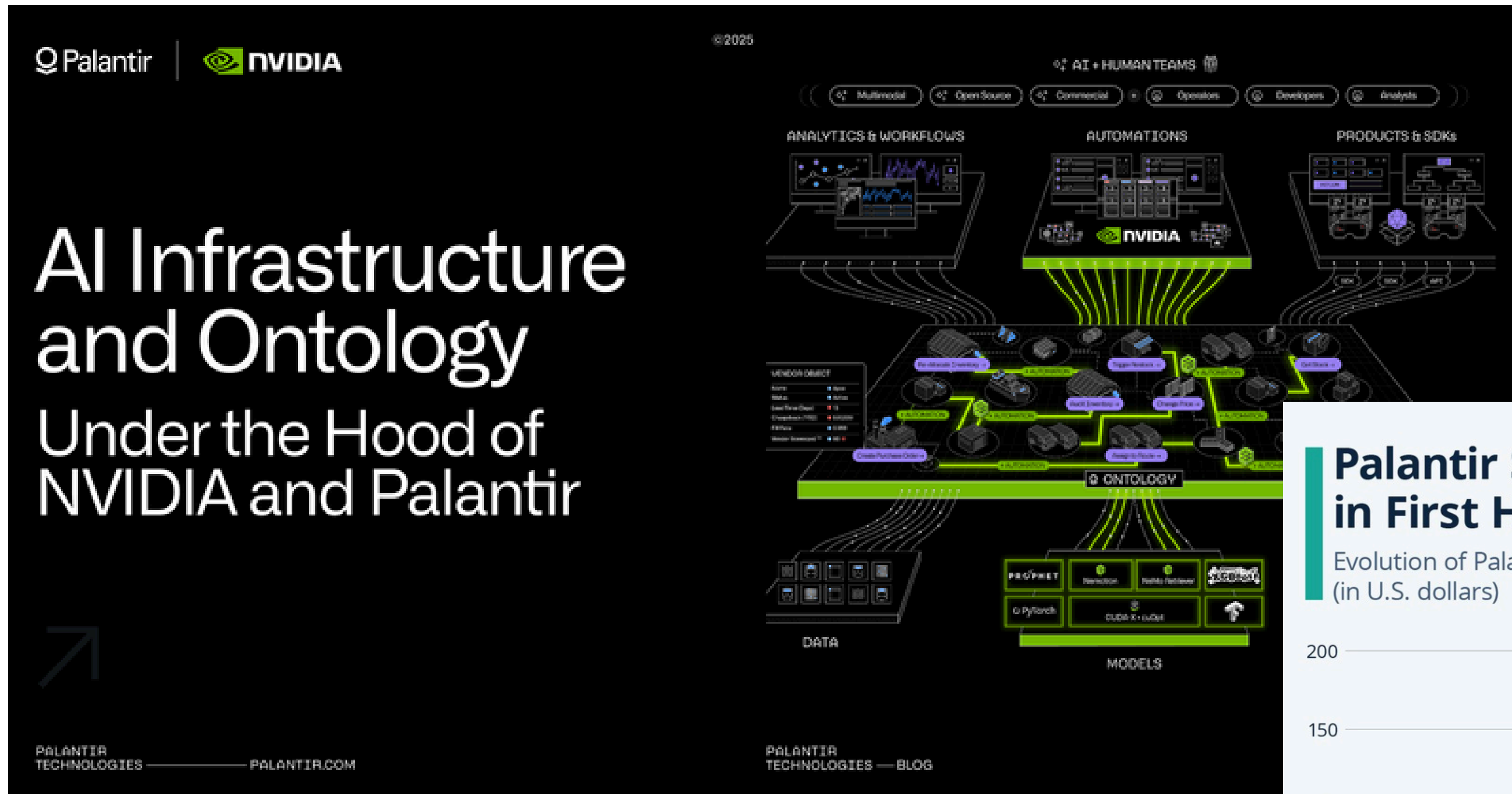
Main Challenge in E2E Operations: Data Interoperability

- Same word means different things for different BU's.
- Different words from different BU's mean the same thing.
- Data desynchronization.



No AI can directly solve this problem

How Do People Solve it: Palantir's Case

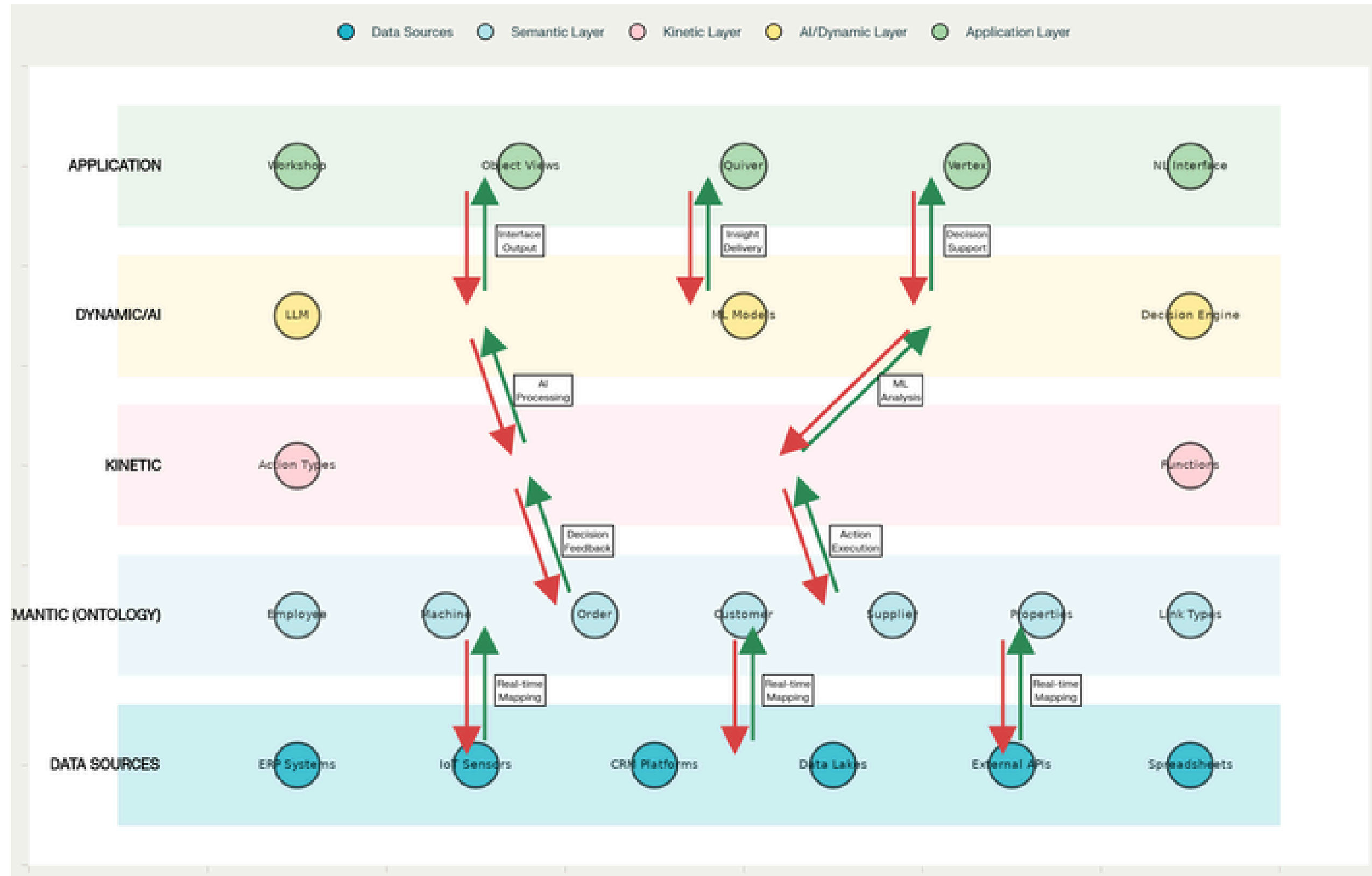


Palantir Stock Nearly Doubles in First Half of 2025

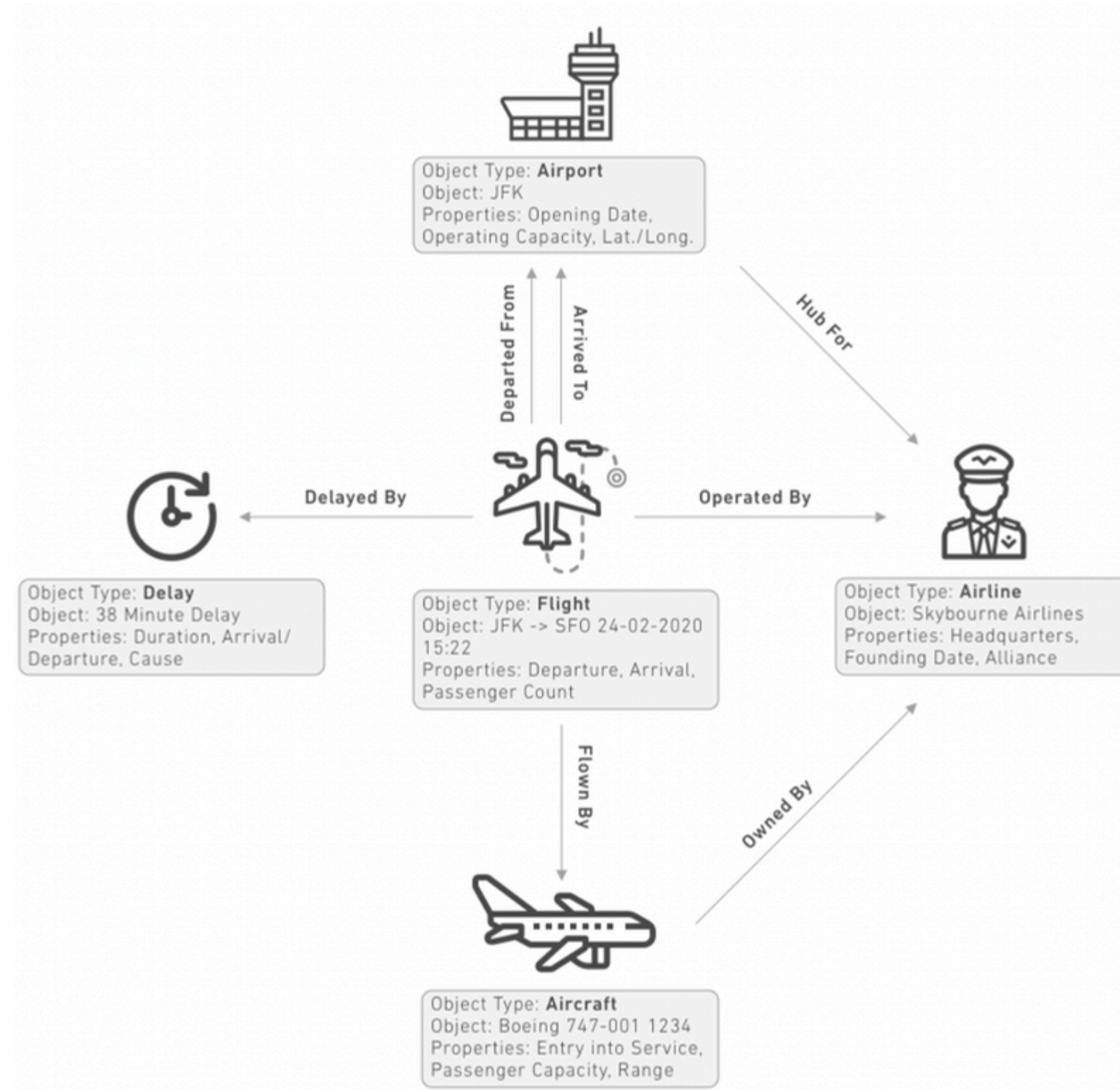
Evolution of Palantir Technologies Inc.'s closing stock price (in U.S. dollars)



Palantir's Framework

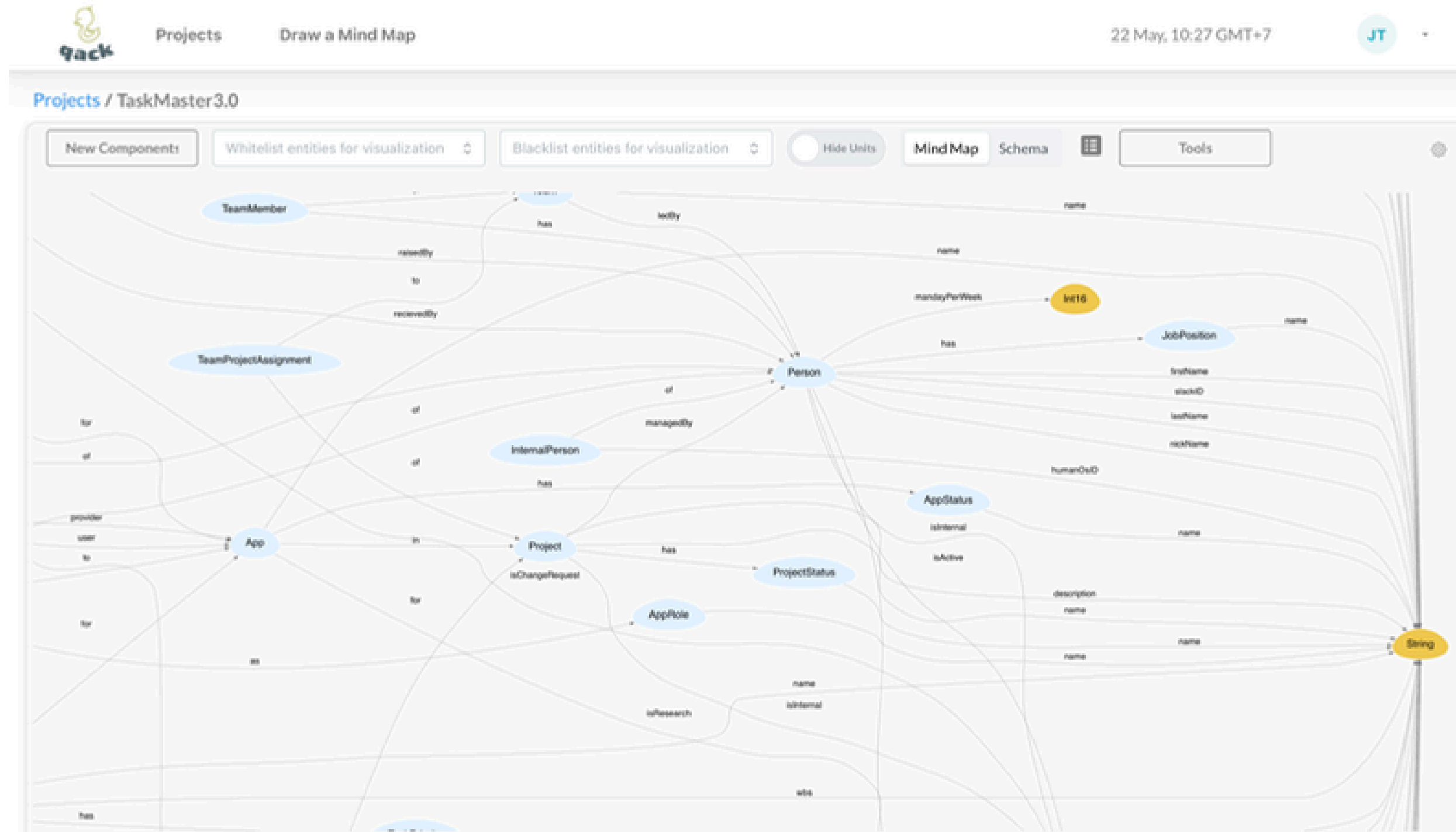


Example of Palantir's Ontology



How QTFT & SCGC Solve it

Using Ontology Logs (Ologs) = Ontology + “Special” Mathematical Properties



Disclaimer: not actual Ologs used in SCGC

What We Did in 2025

Demonstration of E2E planning & Optimization in production

40+

key meetings in SCGC have
been analyzed

100+

data structures have been
reformulated

10+

half-day workshops
with end users

2,000+

terminologies have been
standardized

1,000+

manhours of business
logics discussion

10+

WCI use cases identified.
Two are being tested.

What We are Doing in 2026

Master Dictionary Standardization,

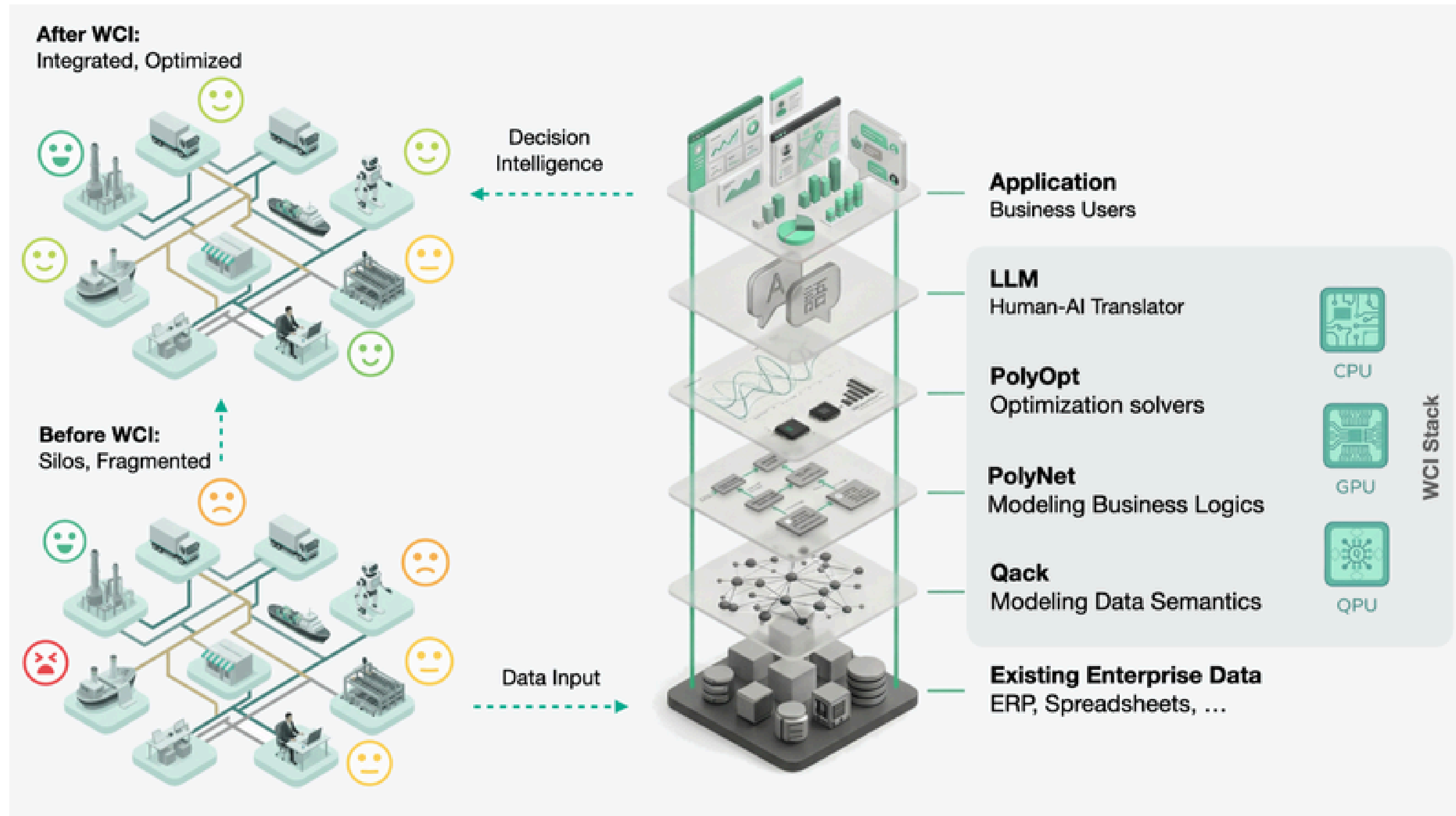
Master Dictionary & Business Logics

Finer E2E Planning Optimization & Dashboard

Agentic AI + WCI Integration

Our Whole Chain Intelligence Platform (WCI)

End-to-End Optimization and Enumeration For Better Coordinated Planning



Example Use Case with E2E Multi Agent System

(In Progress)

 Whole Chain Intelligence (WCI)

We have 10% more orders this month. How do we maximize profit?

DEPLOYING WCI ENGINE

-  Querying enterprise data sources
Sales · Production · Inventory · Warehouse · Procurement
-  Building PolyNet optimization model
5 teams · 6 data sources · 64 constraints
-  Running PolyOpt solver
21,548 scenarios evaluated in 1.2s, selecting the best three

Based on business logics from 5 related teams and their latest data from 6 data sources:

(Sales: 2h ago · Production: yesterday · Inventory: today)

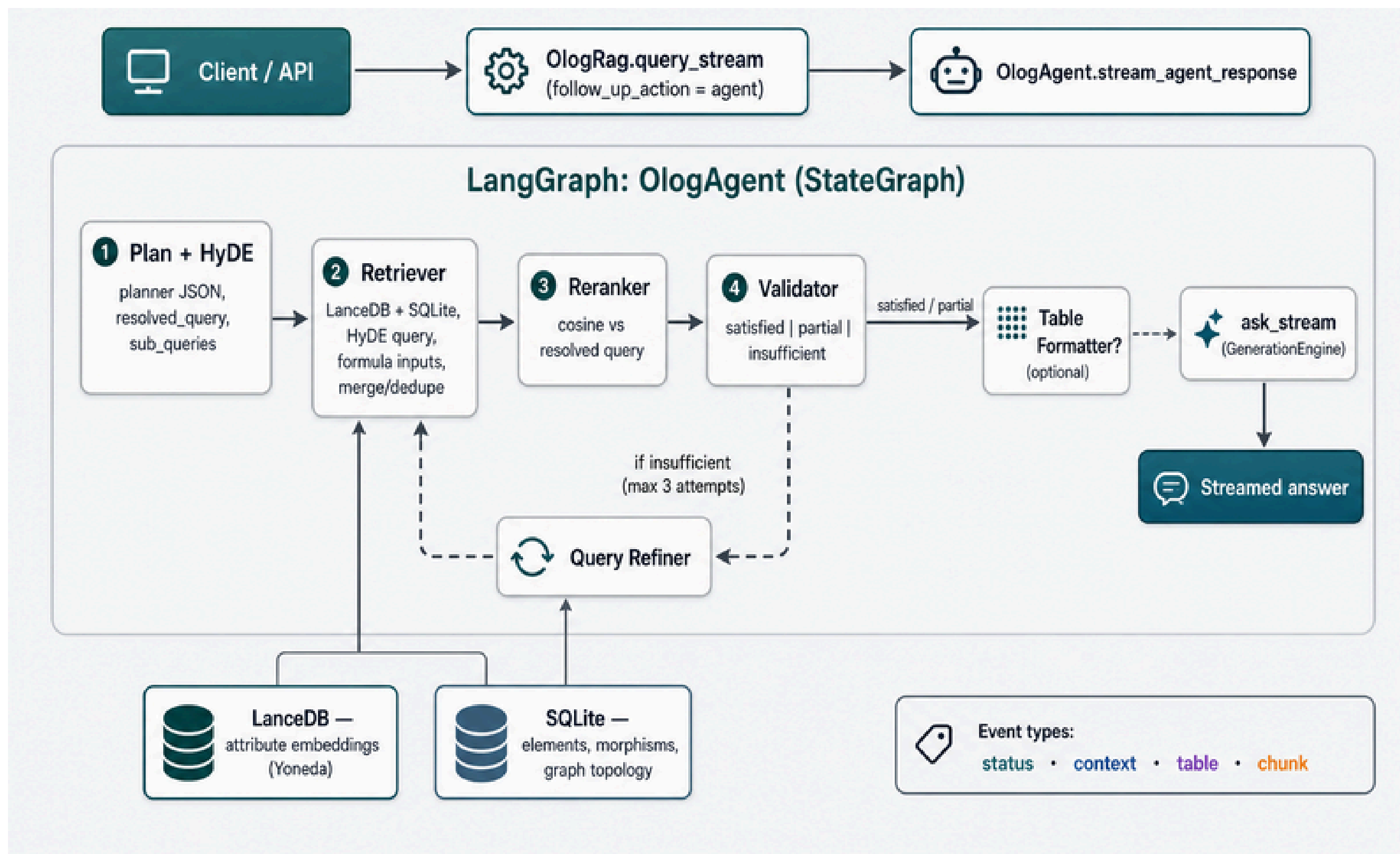
- Max profit (recommended):** take 7% high-margin orders (~1,200 units) → +6.8% profit
- Max service:** take full 10% (~1,700 units) → +5.9% profit
- Low strain:** take 8% (~1,350 units, no overtime) → +6.2% profit

If you choose the max-profit solution, confirm with the following teams:

- Sales**
→ Are these ~1,200 units still the highest-margin orders?
- Production**
→ Is +4.5% capacity (~120 hours) available without risk next month?
- Procurement**
→ Can materials for ~800 units arrive by this Friday?
- Warehouse**
→ Do you confirm ~400 units worth of inventory is usable next week?
- Planning**
→ Do you confirm no bottlenecks shift downstream?

Disclaimer: not actual Ologs used in SCGC

“Simplified” Olog Rag Architecture



Disclaimer: This architecture is not actual AI architecture used in SCGC

Priliminary Benchmarking Results

Compared to **Claude Code**, **Olog Rag** has

30% higher accuracy accross 10 test cases

Standard
LLMs in the
market

70% less token consumptions



Potential Extension in 2027

