Supply Chain Insights, Without the Training Manual: Agents on a Pharma Context Graph

Supply Chain Intelligence

Stop searching. Start asking

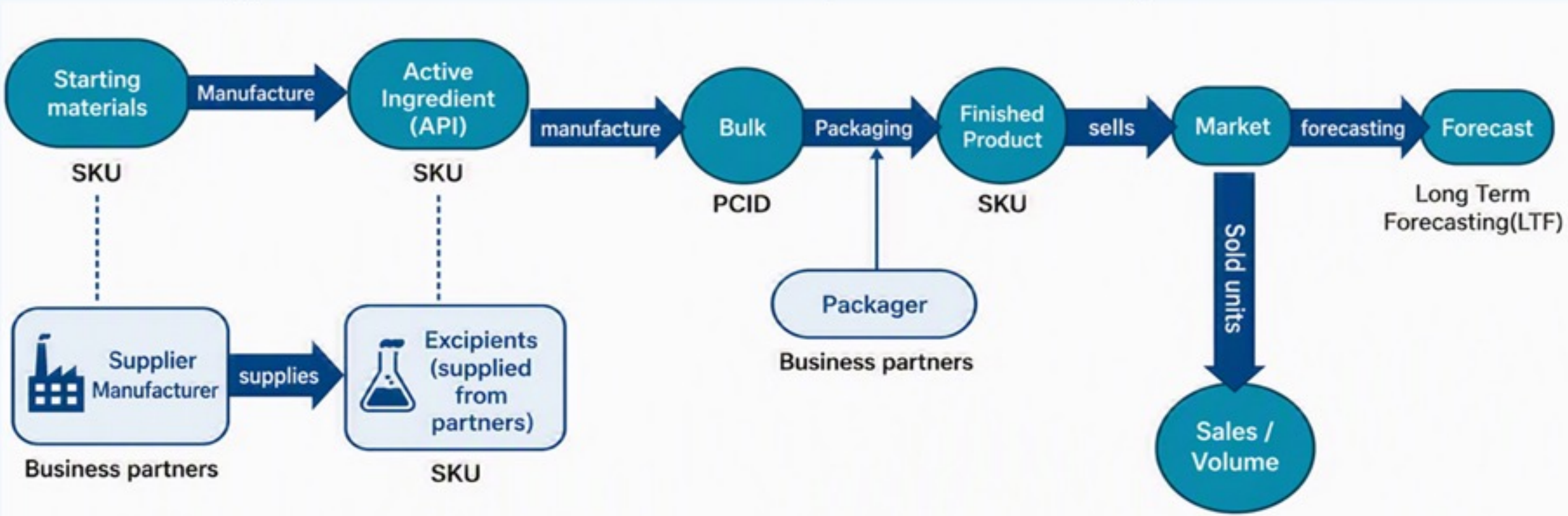
Supply Chain Insights (SCIX)

WHY

”A big part of what we do is decision making. the quality and speed of our **decisions** are based on what we currently know about any situation. What we know is usually **buried in various data sources**, colleagues' minds, and is usually teased out in meetings. This is a substantial barrier to **efficient decision making**”

Strip down the goal.

Drug Product Development Pipeline



This does not include warehousing and supply chain logistics.

Supply Chain Insights Project (SCIX)

- Financial Forecast,
- Quality Management System,
- Master data Products/Companies,
- Supplier Management (KYBP) ,
- Contracts, Registration Documents

How

"It is our mission to **unify and organize** Boehringer's external Supply Chain data so it's easily accessible to all, enables supply chain transparency and increases opportunities **for efficient decision making** and for people to discover new and creative ways to innovate."

Strip down the goal.

Where We Are Today

SCIX — What We Built

- Extracted PDF data into a knowledge graph
- Combined with master data, packaging, forecasts
- 8 category bubbles for **drill-down search**
- **Fixed SPARQL queries** → tabular results
- Cut lead times from weeks to minutes
- Search **Pre-scripted Questions** Listing

What It Can't Do

- Can't ask a question spanning multiple entities
- No end-to-end supply chain visualization
- No network health or risk analysis
- No scenario simulation or "what if"
- **Retrieval only** — no analysis or action
- Manual search for closest predefined questions poor user experience

The data is there. The interface isn't quite there.

The Vision

	Before SCIX	SCIX Today	Goal
Data Access	PDFs, file shares. Hours to weeks.	Centralised KG. Minutes via drill-down.	Seconds. Ask in plain language.
Visibility	Fragmented. No single view.	Tables per entity. Assemble it yourself.	Full end-to-end. Origin to shelf, one ask.
Risk Analysis	Manual spreadsheets. Quarterly reviews.	Not possible.	Automated graph analytics. Scored & actionable.
Scenario Planning	Multi-day fire drill. Reactive.	Not possible.	Real-time simulation. Revenue + alternatives.

VISION

We believe having data is valuable for decision making, having well organized, accessible data is game changing..

Meet the Personas

The four roles behind Scenarios 1–4

Alice

Regulatory Operations Specialist

Answers urgent QA queries about substances, sites, and product exposure. Speed and completeness are critical.

Bob

Product Supply Manager, EMEA

Needs to trace any product's full journey — from shelf back to starting materials — for reviews, audits, and investigations.

Marie

Supply Chain Resilience Lead

Responsible for finding hidden fragilities — single points of failure, geographic concentration, over-reliance on key suppliers — before they become crises.

Pierre

VP Portfolio Strategy & Commercial Ops

Cares about revenue at risk and decisive playbooks. Needs answers with numbers, recommendations, and a path to action.

Four Workflows, One Interface

Natural language access to everything in the knowledge graph

Ask & Get

Natural language retrieval.
No drilling. Just ask.

Alice

Trace-Through

End-to-end supply chain visibility. Origin to shelf.

Bob

Health Check

Network resilience metrics.
Risks & recommendations.

Marie

What If?

Scenario simulation.
Revenue impact & alternatives.

Pierre

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visibility. Origin

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recommendations.

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What If?

Scenario simulation.
Revenue impact &
alternatives.

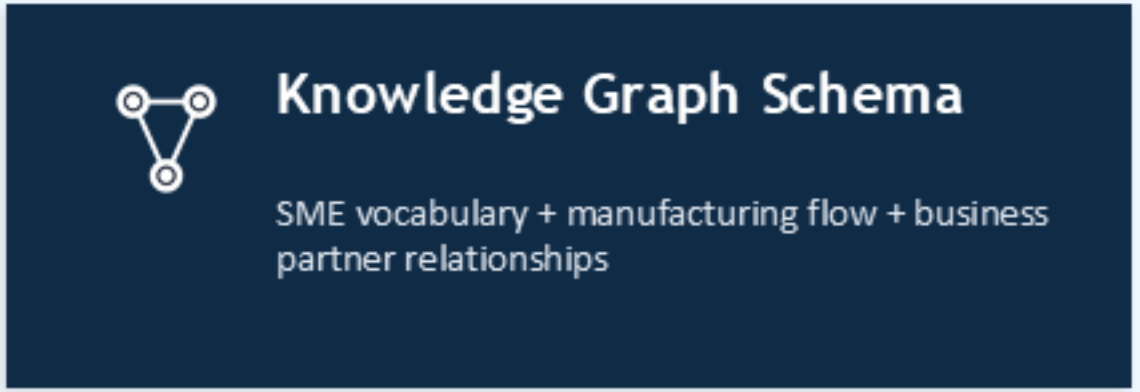
Pierre

Useability/User Experience

All Four Workflows Depend on One Thing

A knowledge graph schema that accurately captures how our SMEs talk about the supply chain — their vocabulary, their understanding of the manufacturing flow, their mental model of how products are made.

The Schema Is the Bedrock



Get the schema wrong, and none of these workflows work.
Get it right, and they all follow naturally.

What We Need From the Schema

The right node labels

Do we call it "Starting Material" or "Raw Material"? "CMO" or "Contract Manufacturer"? The schema must speak the SMEs' language — not textbook ontology labels.

The right relationships

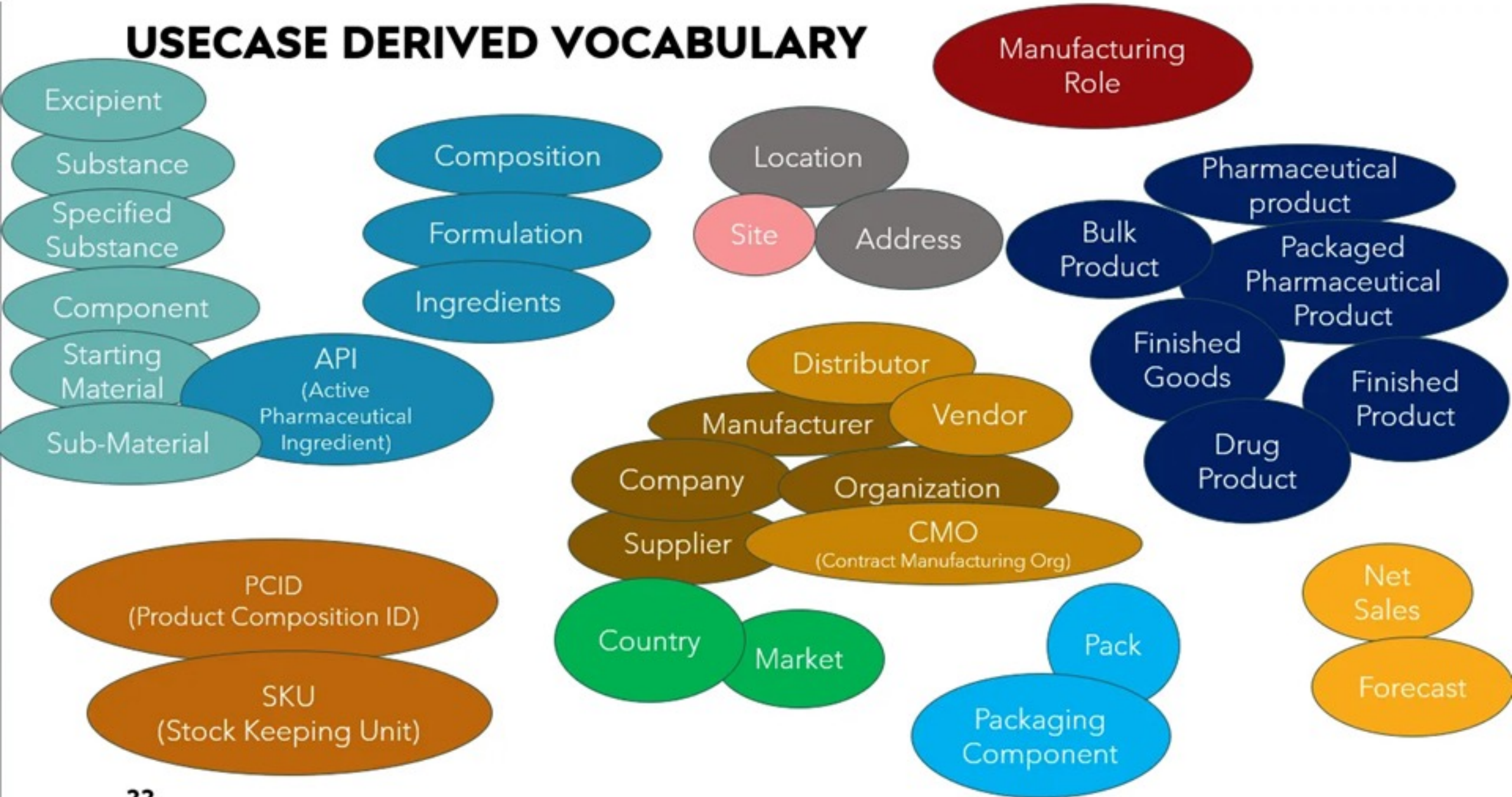
SUPPLIES, MANUFACTURES, CONTAINS, PACKAGED_AS — the edges must reflect real supply chain flows as the team understands them, so Cypher queries read naturally.

The right properties

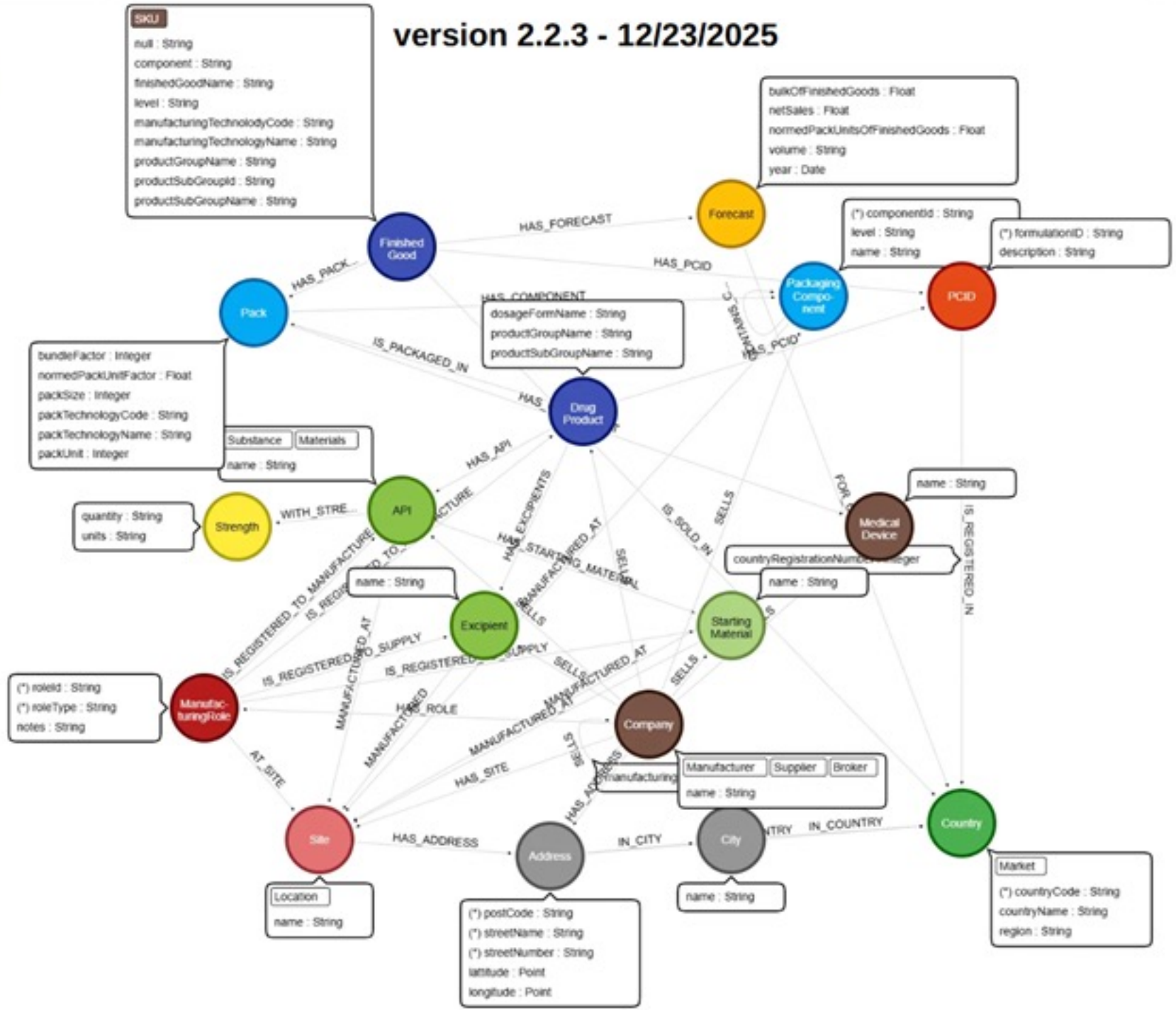
SKU, PCID, site location, capacity, forecast volume — what data sits on each node? What do Alice, Bob, Marie, and Pierre actually need to answer their questions?

If the graph speaks the same language the team speaks, the LLM can translate between them effortlessly.

USECASE DERIVED VOCABULARY



The Schema (PoC)



Accelerate decision making and task resolution with Natural language access to the data in your world.

Ask & Get

Natural language retrieval.
No drilling. Just ask.

Alice

Trace-Through

End-to-end supply chain visibility. Origin to shelf.

Bob

Health Check

Network resilience metrics.
Risks & recommendations.

Marie

What If?

Scenario simulation.
Revenue impact & alternatives.

Pierre

Scenario 1

Ask & Get

Alice

Regulatory Operations Specialist

Answers urgent QA queries about substances, sites, and product exposure. Speed and completeness are critical.

The Situation

5:20 PM — QA flags contaminated magnesium stearate from a supplier. Alice needs every affected product and SKU immediately.

SCIX Today

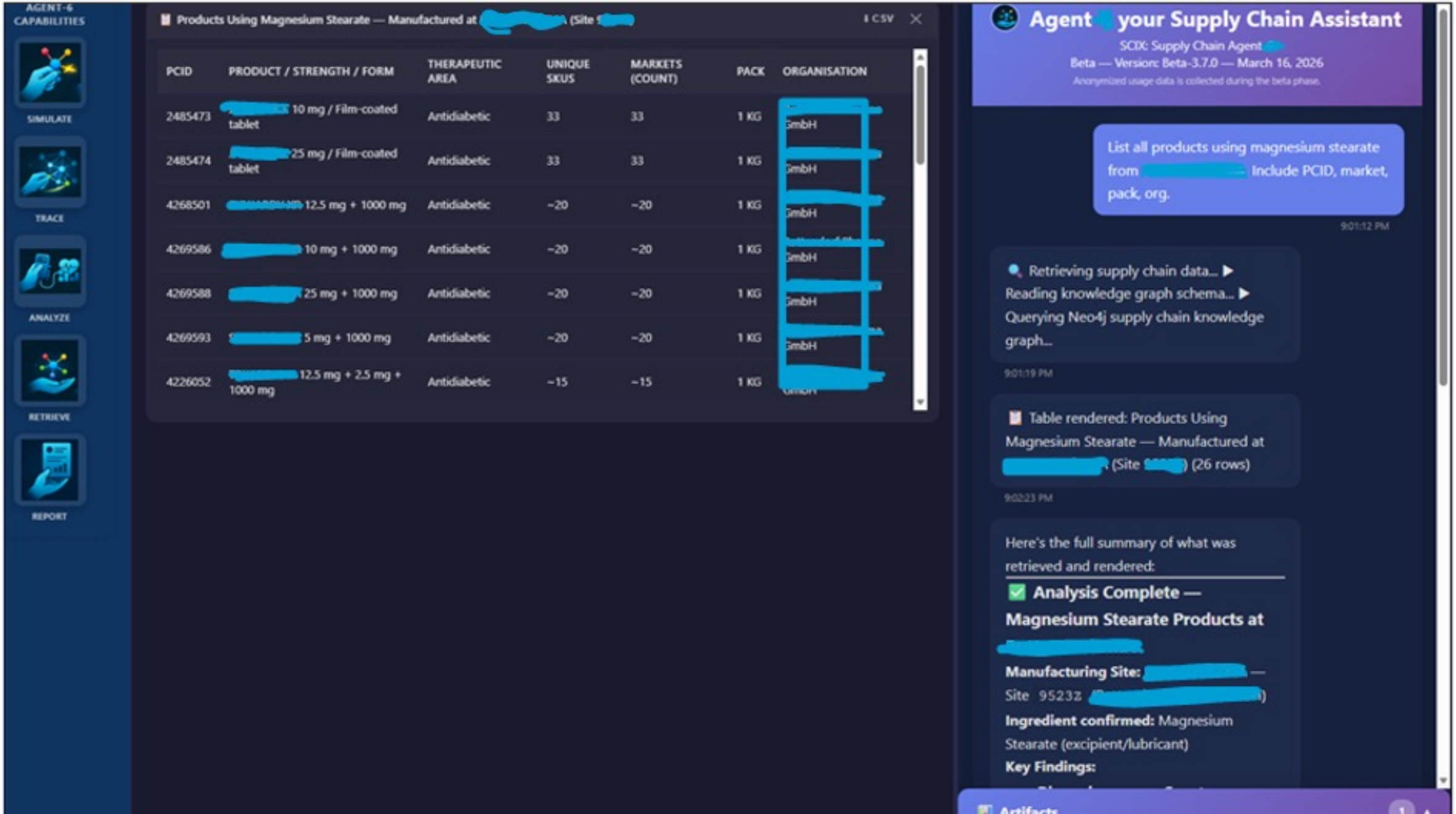
Click Product Composition → filter substance → switch to Organization → export both → download csv compile in Excel → 45–90 min, partial confidence.

PoC today

"List all products using magnesium stearate from Kleindorf Ltd. Include PCID, market, pack, org."

Complete table returned in seconds. One-click CSV export. No manual assembly required.

PoC Results


AGENT-6 CAPABILITIES
SIMULATE
TRACE
ANALYZE
RETRIEVE
REPORT
Products Using Magnesium Stearate — Manufactured at [redacted] (Site [redacted])
CSV
PCID
PRODUCT / STRENGTH / FORM
THERAPEUTIC AREA
UNIQUE SKUS
MARKETS (COUNT)
PACK
ORGANISATION
2485473 [redacted] 10 mg / Film-coated tablet Antidiabetic 33 33 1 KG [redacted] GmbH
2485474 [redacted] 25 mg / Film-coated tablet Antidiabetic 33 33 1 KG [redacted] GmbH
4268501 [redacted] 12.5 mg + 1000 mg Antidiabetic ~20 ~20 1 KG [redacted] GmbH
4269586 [redacted] 10 mg + 1000 mg Antidiabetic ~20 ~20 1 KG [redacted] GmbH
4269588 [redacted] 25 mg + 1000 mg Antidiabetic ~20 ~20 1 KG [redacted] GmbH
4269593 [redacted] 5 mg + 1000 mg Antidiabetic ~20 ~20 1 KG [redacted] GmbH
4226052 [redacted] 12.5 mg + 2.5 mg + 1000 mg Antidiabetic ~15 ~15 1 KG [redacted]
Agent [redacted] your Supply Chain Assistant
SCDX: Supply Chain Agent [redacted]
Beta — Version: Beta-3.7.0 — March 16, 2026
Anonymized usage data is collected during the beta phase.
List all products using magnesium stearate from [redacted] Include PCID, market, pack, org.
9:01:12 PM
Retrieving supply chain data... ▶
Reading knowledge graph schema... ▶
Querying Neo4j supply chain knowledge graph...
9:01:19 PM
Table rendered: Products Using Magnesium Stearate — Manufactured at [redacted] (Site [redacted]) (26 rows)
9:02:23 PM
Here's the full summary of what was retrieved and rendered:
✅ Analysis Complete — Magnesium Stearate Products at [redacted]
Manufacturing Site: [redacted] — Site 95232 [redacted]
Ingredient confirmed: Magnesium Stearate (excipient/lubricant)
Key Findings:
Artifacts

Scenario 2

See the Whole Thread

Bob

Product Supply Manager, EMEA

Needs to trace any product's full journey — from shelf back to starting materials — for reviews, audits, and investigations.

The Situation

Supply review prep. Bob needs to show his manager the complete supply chain for Micardis — every partner, site, and intermediate — from starting materials to the German market shelf. He wants to show it as a visual network, not a spreadsheet.

SCIX Today

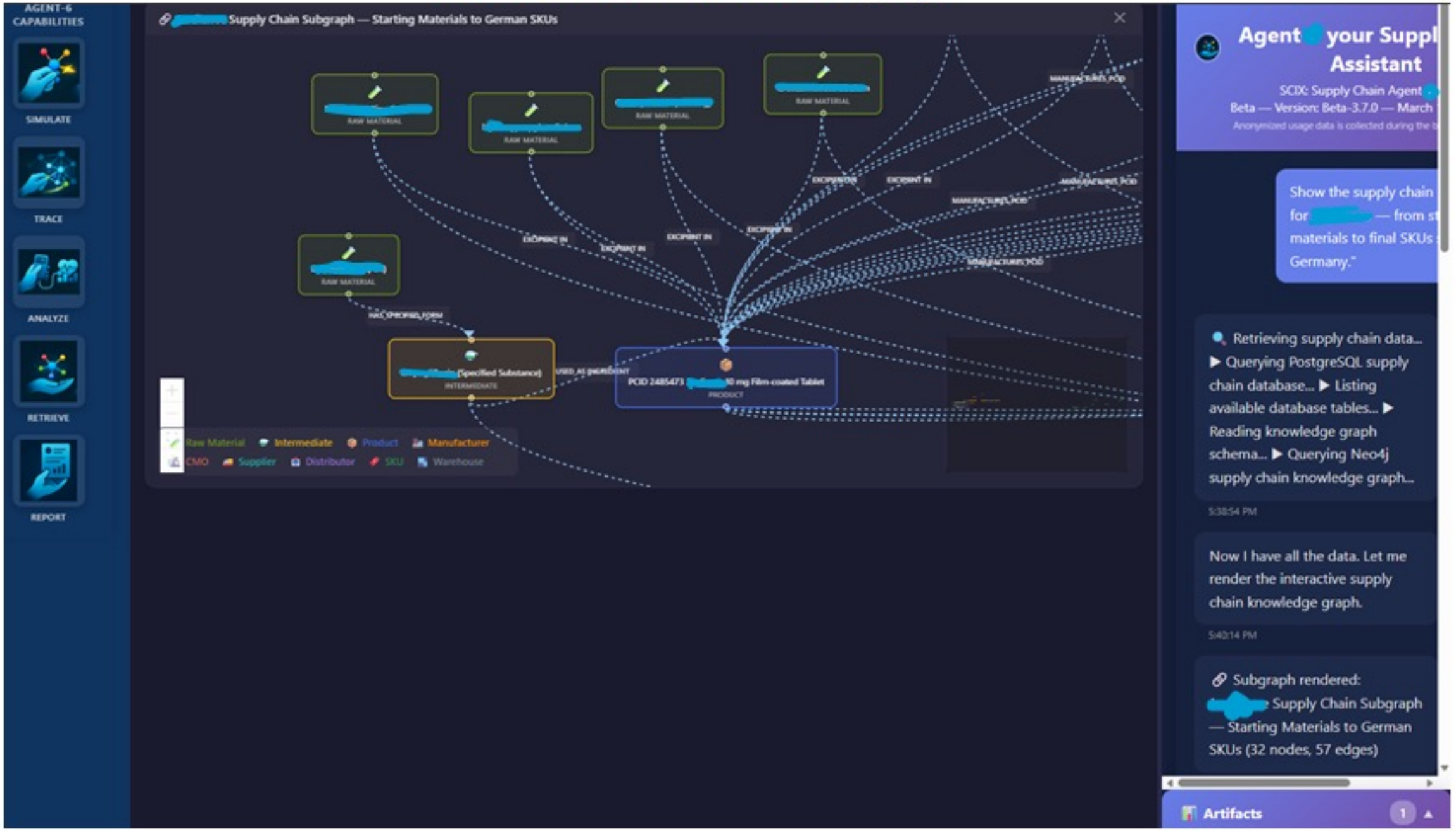
Multiple tabs, one entity per screen. Repeated drill downs to get to desired information. Assembling the full picture could be an afternoon's work. Static — can't answer follow-up questions.

PoC Today

"Show the supply chain subgraph for Micardis — from starting materials to final SKUs sold in Germany."

Interactive network graph painted on canvas. Every node shows site, role, and registration. Geo map included. Clickable and explorable in real time.

PoC Results – Product Subgraph



AGENT-6 CAPABILITIES

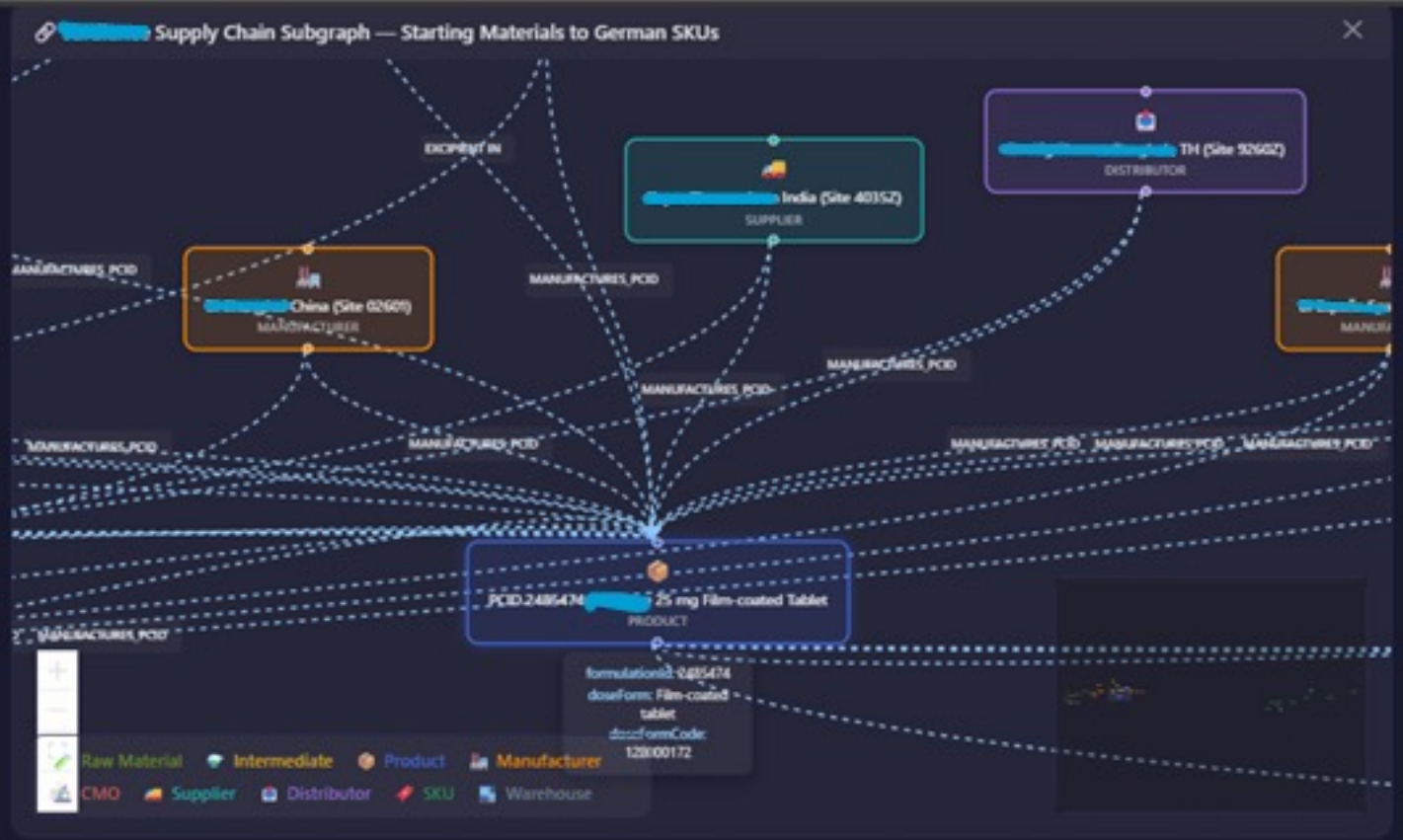
SIMULATE

TRACE

ANALYZE

RETRIEVE

REPORT



Tier 2 — Bulk Drug Products (2 PCIDs)

PCID	Description
2485473	10 mg Film-coated Tablet
2485474	25 mg Film-coated Tablet

Tier 3 — Manufacturing Sites (13 sites across 9 countries)

(DE) · Spain · Greece · India · Thailand · USA — with **8 of 13 sites** operated by Boehringer Ingelheim entities.

Tier 4 — German Market SKUs (30 total)

- **17 SKUs** for 10 mg (pack sizes: 10×10, 10×3, 7×2, 10×1 blisters)
- **13 SKUs** for 25 mg (pack sizes: 10×10, 10×3, 7×2 blisters)

No further requests are queued. Let me know if you'd like a deeper dive — e.g. risk analysis, geographic map of manufacturing sites, or a full PDF report.

5:40:56 PM

Type your message... (Shift+Enter for new line)

Send

Reset

Artifacts 1

Scenario 3

Check the Pulse

Marie

Supply Chain Resilience Lead

Responsible for finding hidden fragilities — single points of failure, geographic concentration, over-reliance on key suppliers — before they become crises.

The Challenge

A natural disaster is reported in Asia. Marie needs to know immediately which BI manufacturing sites fall within the impact radius, which products are exposed, and whether alternative sites exist — before the supply board meeting.

SCIX Today

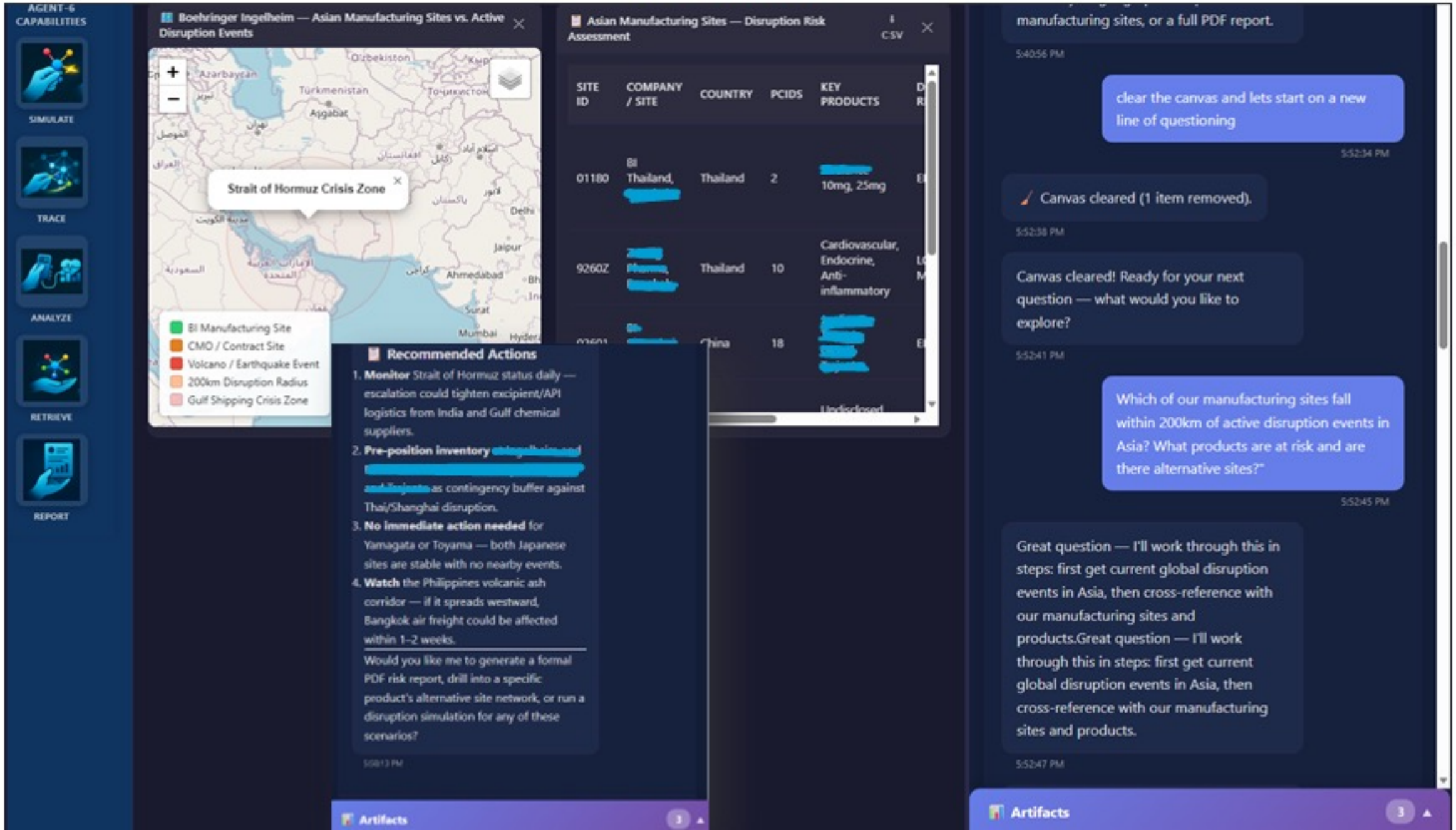
Manual process: check news, identify country, look up sites in separate system, cross-reference product exposure one by one. Could take hours. By then decisions are already being made without the data.

PoC Today

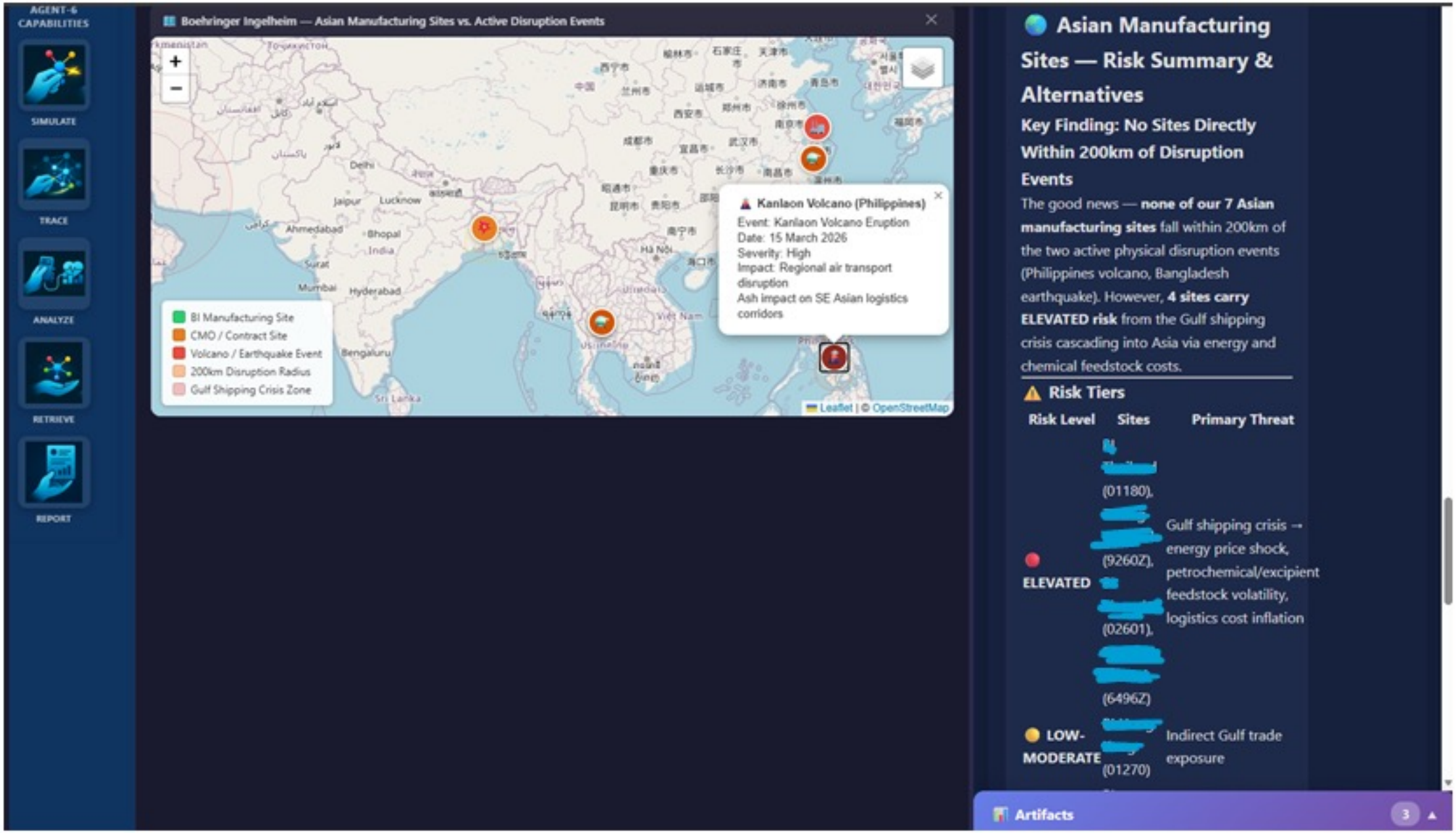
"Which of our manufacturing sites fall within 200km of active disruption events in Asia? What products are at risk and are there alternative sites?"

Map of exposed sites with distance markers. Affected products listed with registration status at alternative sites. Full report generated and downloadable as PDF.

PoC Results


AGENT-6 CAPABILITIES
SIMULATE
TRACE
ANALYZE
RETRIEVE
REPORT
Boehringer Ingelheim — Asian Manufacturing Sites vs. Active Disruption Events
Strait of Hormuz Crisis Zone
BI Manufacturing Site
CMO / Contract Site
Volcano / Earthquake Event
200km Disruption Radius
Gulf Shipping Crisis Zone
Asian Manufacturing Sites — Disruption Risk Assessment
CSV
SITE ID
COMPANY / SITE
COUNTRY
PCIDS
KEY PRODUCTS
01180
Thailand
2
10mg, 25mg
9260Z
Thailand
10
Cardiovascular, Endocrine, Anti-inflammatory
China
18
Undisclosed
Recommended Actions
1. Monitor Strait of Hormuz status daily — escalation could tighten excipient/API logistics from India and Gulf chemical suppliers.
2. Pre-position inventory as contingency buffer against Thai/Shanghai disruption.
3. No immediate action needed for Yamagata or Toyama — both Japanese sites are stable with no nearby events.
4. Watch the Philippines volcanic ash corridor — if it spreads westward, Bangkok air freight could be affected within 1–2 weeks.
Would you like me to generate a formal PDF risk report, drill into a specific product's alternative site network, or run a disruption simulation for any of these scenarios?
Artifacts
3
manufacturing sites, or a full PDF report.
5:40:56 PM
clear the canvas and lets start on a new line of questioning
5:52:34 PM
Canvas cleared (1 item removed).
5:52:38 PM
Canvas cleared! Ready for your next question — what would you like to explore?
5:52:41 PM
Which of our manufacturing sites fall within 200km of active disruption events in Asia? What products are at risk and are there alternative sites?"
5:52:45 PM
Great question — I'll work through this in steps: first get current global disruption events in Asia, then cross-reference with our manufacturing sites and products.Great question — I'll work through this in steps: first get current global disruption events in Asia, then cross-reference with our manufacturing sites and products.
5:52:47 PM
Artifacts
3

PoC Results


AGENT-6 CAPABILITIES
SIMULATE
TRACE
ANALYZE
RETRIEVE
REPORT
Boehringer Ingelheim — Asian Manufacturing Sites vs. Active Disruption Events
Delhi
Jaipur
Lucknow
Ahmedabad
Bhopal
India
Surat
Mumbai
Hyderabad
Bengaluru
Sri Lanka
Viet Nam
BI Manufacturing Site
CMO / Contract Site
Volcano / Earthquake Event
200km Disruption Radius
Gulf Shipping Crisis Zone
Kanlaon Volcano (Philippines)
Event: Kanlaon Volcano Eruption
Date: 15 March 2026
Severity: High
Impact: Regional air transport disruption
Ash impact on SE Asian logistics corridors
Leaflet | © OpenStreetMap
Asian Manufacturing Sites — Risk Summary & Alternatives
Key Finding: No Sites Directly Within 200km of Disruption Events
The good news — none of our 7 Asian manufacturing sites fall within 200km of the two active physical disruption events (Philippines volcano, Bangladesh earthquake). However, 4 sites carry ELEVATED risk from the Gulf shipping crisis cascading into Asia via energy and chemical feedstock costs.
Risk Tiers
Risk Level
Sites
Primary Threat
(01180),
(9260Z),
ELEVATED
Gulf shipping crisis → energy price shock, petrochemical/excipient feedstock volatility, logistics cost inflation
(02601),
(6496Z)
LOW-MODERATE
Indirect Gulf trade exposure
(01270)
Artifacts
3

Scenario 3

Check the Pulse

Marie

Supply Chain Resilience Lead

Responsible for finding hidden fragilities — single points of failure, geographic concentration, over-reliance on key suppliers — before they become crises.

The Challenge

Which nodes in the supply chain graph have the highest betweenness centrality — meaning their failure would most disrupt supply flows across the network?

SCIX Today

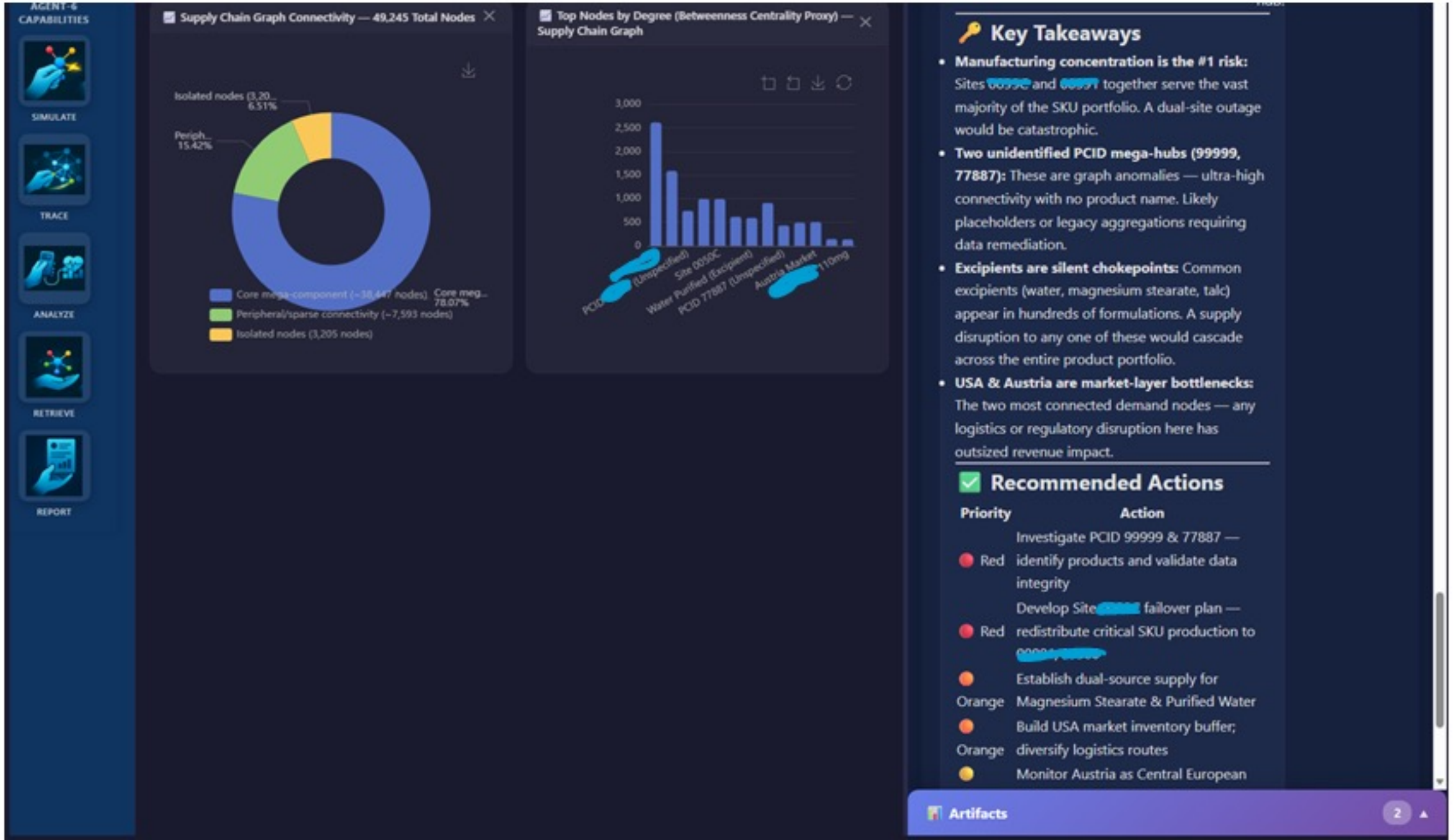
Not currently done. Would need to be manually implemented with a pre-written SPARQL query and even then would luck the instant analysis representation for it to make sense for users.

PoC Today

"Which nodes in the supply chain graph have the highest betweenness centrality — meaning their failure would most disrupt supply flows across the network?"
"

. 96 seconds. For a betweenness centrality analysis on a 49,245-node, 91,500-relationship graph that surfaced structural vulnerabilities nobody had previously identified.

PoC Results


AGENT-6 CAPABILITIES
SIMULATE
TRACE
ANALYZE
RETRIEVE
REPORT
Supply Chain Graph Connectivity — 49,245 Total Nodes
Isolated nodes (3,20... 6.51%
Periph... 15.42%
Core meg... 78.07%
Core mega-component (~38,447 nodes)
Peripheral/sparse connectivity (~7,593 nodes)
Isolated nodes (3,205 nodes)
Top Nodes by Degree (Betweenness Centrality Proxy) — Supply Chain Graph
3,000
2,500
2,000
1,500
1,000
500
0
PCID
(Unspecified)
Site 0050C
Water Purified (Excipient)
PCID 77887 (Unspecified)
Austria Market
110mg
Key Takeaways
Manufacturing concentration is the #1 risk: Sites 0059C and 0059T together serve the vast majority of the SKU portfolio. A dual-site outage would be catastrophic.
Two unidentified PCID mega-hubs (99999, 77887): These are graph anomalies — ultra-high connectivity with no product name. Likely placeholders or legacy aggregations requiring data remediation.
Excipients are silent chokepoints: Common excipients (water, magnesium stearate, talc) appear in hundreds of formulations. A supply disruption to any one of these would cascade across the entire product portfolio.
USA & Austria are market-layer bottlenecks: The two most connected demand nodes — any logistics or regulatory disruption here has outsized revenue impact.
Recommended Actions
Priority
Action
Red
Investigate PCID 99999 & 77887 — identify products and validate data integrity
Red
Develop Site failover plan — redistribute critical SKU production to
Orange
Establish dual-source supply for Magnesium Stearate & Purified Water
Orange
Build USA market inventory buffer; diversify logistics routes
Monitor Austria as Central European
Artifacts
2

PoC Results

AGENT-6 CAPABILITIES

SIMULATE

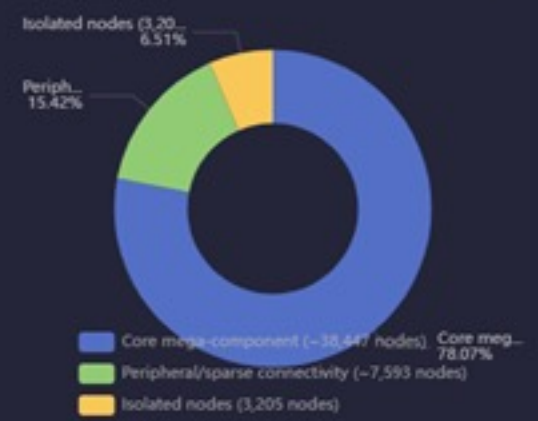
TRACE

ANALYZE

RETRIEVE

REPORT

Supply Chain Graph Connectivity — 49,245 Total Nodes



Top Nodes by Degree (Betweenness Centrality Proxy) — Supply Chain Graph

Critical Single Points of Failure — Supply Chain Graph (Betweenness Centrality) ⬇ CSV

RANK	NODE	TYPE	DEGREE	WHY IT'S CRITICAL	RISK LEVEL
1	Site [redacted]	Manufacturing Site	2,619	Produces 2,618 SKUs — ~86% of finished goods portfolio	Critical
2	PCID [redacted] (Unspecified)	Product Composition	740	Distributed to 96 countries via 729 SKUs — identity unknown, data gap	Critical
3	PCID [redacted] (Unspecified)	Product Composition	430	429 SKUs across 95 markets — also unidentified, requires investigation	Critical
4	Site [redacted]	Manufacturing Site	1,591	Primary backup to 0099C; 1,542 SKUs — dual-site failure = supply collapse	Critical
5	Water, Purified (Excipient)	Ingredient	591	Used in 144 distinct PCIDs — silent formulation bottleneck	High
6	Magnesium Stearate (Excipient)	Ingredient	490	Used in 159 distinct PCIDs — widest excipient reach in portfolio	High
7	USA Market	Market	615	126 SKU variants across 59 PCIDs — largest single-market degree	High
	Austria Market	Market	503	Most product-diverse market (76 PCIDs) — EU	Medium-

11:43:34 PM

please display the critical points of failure in a table in the canvas

12:23:29 AM

Table rendered: Critical Single Points of Failure — Supply Chain Graph (Betweenness Centrality) (10 rows)

12:23:39 AM

The analysis is complete — no further processing is pending from previous requests.

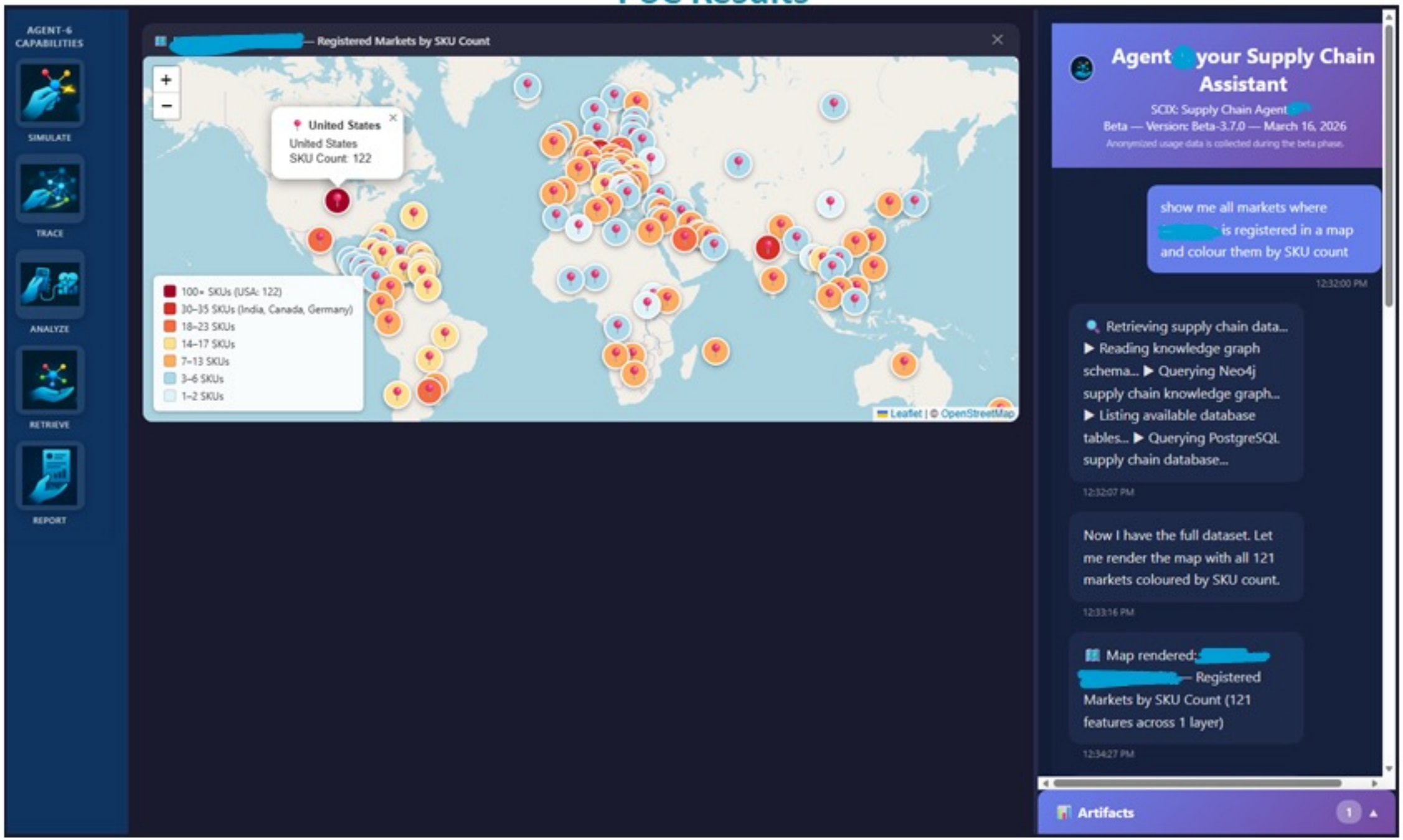
Session Summary

Here's what we covered today:

1. **Graph Connectivity** — The supply chain graph (49,245 nodes, 91,500 relationships) is **not fully connected**. 93.5% of nodes form a core mega-component, while 6.5% (3,205 nodes) are isolated — primarily AICombo, Substance, and ManufacturedItem nodes.
2. **Betweenness Centrality / Critical Nodes** — Identified the top nodes whose failure would most disrupt supply flows:
   - **Site** [redacted] is the single highest-risk node (degree 2,619; ~86% of SKUs).
   - **PCIDs** [redacted] **&** [redacted] are unidentified mega-hubs requiring data investigation.
   - **Purified Water & Magnesium Stearate** are silent excipient chokepoints across 100+ formulations.
   - **USA & Austria** are the most critical market-layer nodes.

Artifacts 3

PoC Results


AGENT-6 CAPABILITIES
SIMULATE
TRACE
ANALYZE
RETRIEVE
REPORT
[redacted] — Registered Markets by SKU Count
United States
United States
SKU Count: 122
100+ SKUs (USA: 122)
30–35 SKUs (India, Canada, Germany)
18–23 SKUs
14–17 SKUs
7–13 SKUs
3–6 SKUs
1–2 SKUs
Leaflet | © OpenStreetMap
Agent [redacted] your Supply Chain Assistant
SCIX: Supply Chain Agent [redacted]
Beta — Version: Beta-3.7.0 — March 16, 2026
Anonymized usage data is collected during the beta phase.
show me all markets where [redacted] is registered in a map and colour them by SKU count
12:32:00 PM
Retrieving supply chain data... ▶ Reading knowledge graph schema... ▶ Querying Neo4j supply chain knowledge graph... ▶ Listing available database tables... ▶ Querying PostgreSQL supply chain database...
12:32:07 PM
Now I have the full dataset. Let me render the map with all 121 markets coloured by SKU count.
12:33:16 PM
Map rendered: [redacted] — Registered Markets by SKU Count (121 features across 1 layer)
12:34:27 PM
Artifacts 1

Scenario 4

What If?

Pierre

VP Portfolio Strategy
& Commercial Ops

Cares about revenue at risk and decisive playbooks. Needs answers with numbers, recommendations, and a path to action.

Scenario A

Indian government restricts Ammonia exports. Ammonia is a starting material for Metformin — used in Drug Product Y. BI has 3 months of stock. Which products are affected and where are alternative suppliers?

Scenario B

A geopolitical event flags elevated risk in a key API supplier region. Which cash-cow products are exposed? Are there registered alternative suppliers ready to activate?

Before Agent-6

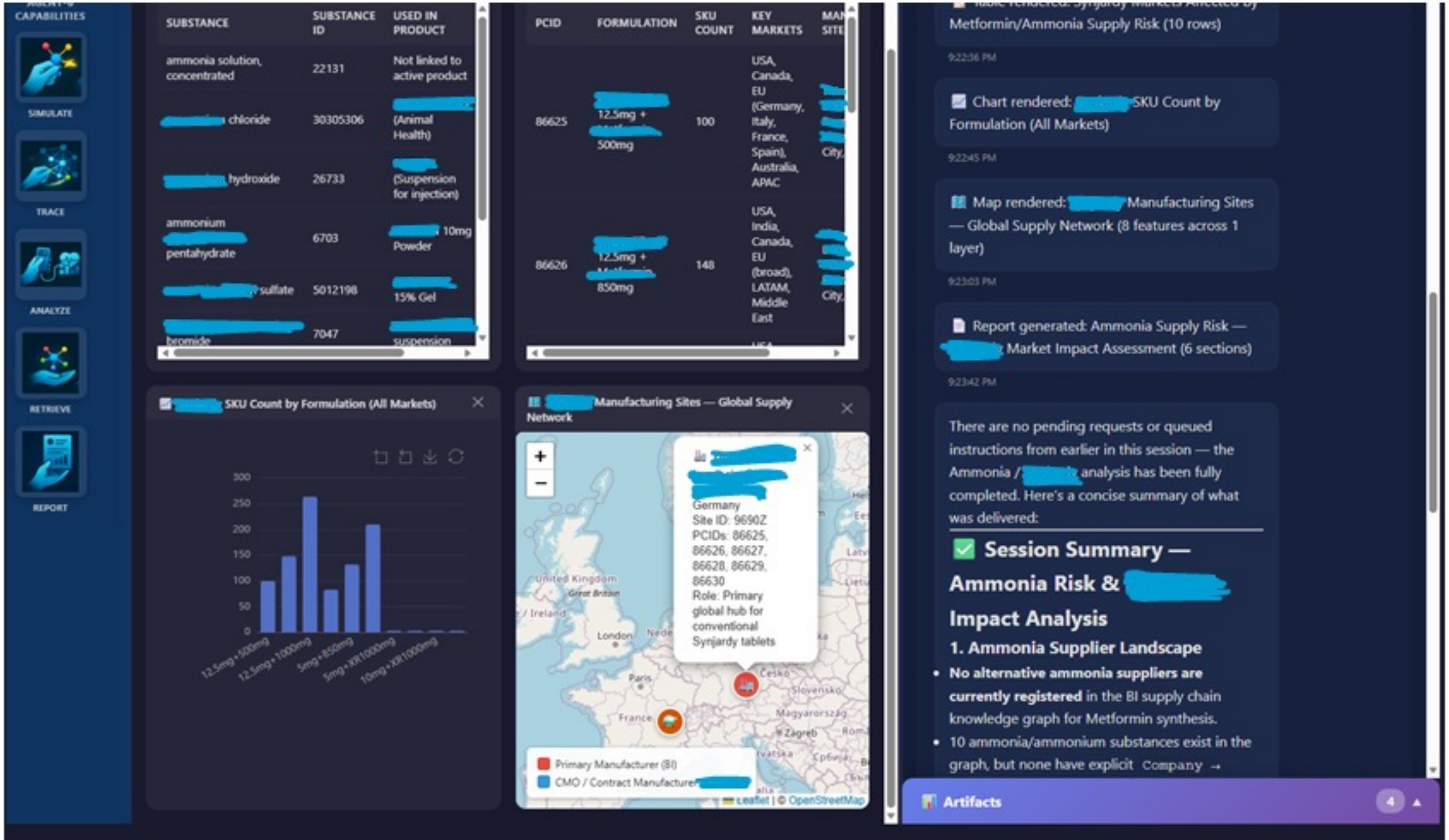
Call 6 people across site ops, planning, finance, commercial. 2–3 days to assemble a picture. By then, decisions are already being made on instinct.

PoC Today

"We have 3 months of Ammonia stock. Show alternative suppliers for Ammonia used in Metformin production and which Drug Product Y markets are affected."

Full supply chain impact map. Alternative suppliers listed with registration status. Affected SKUs and markets identified. Geopolitical risk context from live news feeds included.

PoC Results


CAPABILITIES
SIMULATE
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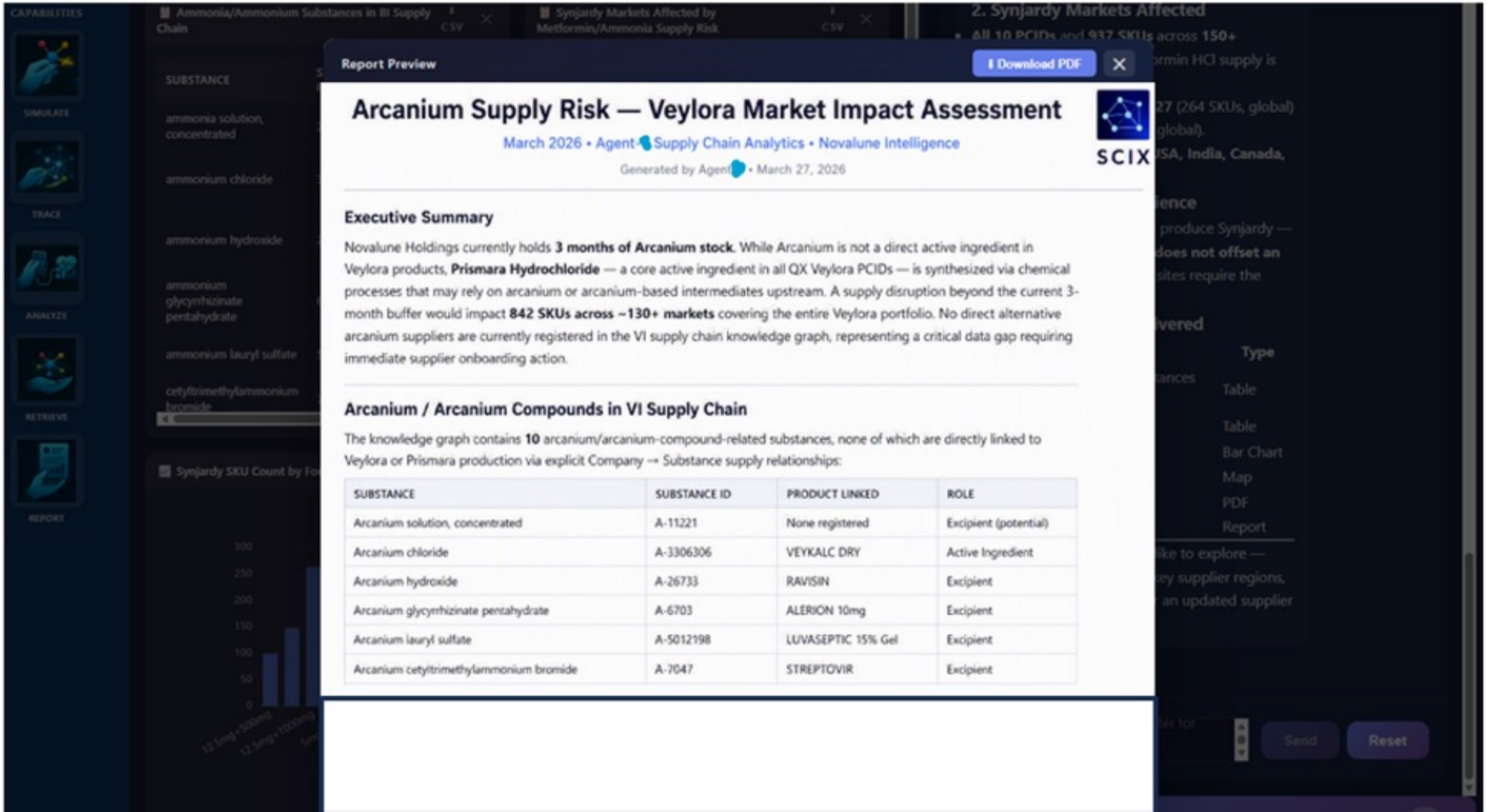
ANALYZE
RETRIEVE
REPORT
SUBSTANCE
SUBSTANCE ID
USED IN PRODUCT
ammonia solution, concentrated
22131
Not linked to active product
chloride
30305306
(Animal Health)
hydroxide
26733
(Suspension for injection)
ammonium
pentahydrate
6703
Powder
sulfate
5012198
15% Gel
bromide
7047
suspension
PCID
FORMULATION
SKU COUNT
KEY MARKETS
86625
12.5mg +
500mg
100
USA, Canada, EU (Germany, Italy, France, Spain), Australia, APAC
86626
12.5mg +
850mg
148
USA, India, Canada, EU (broad), LATAM, Middle East
SKU Count by Formulation (All Markets)
300
250
200
150
100
50
0
Manufacturing Sites — Global Supply Network
Germany
Site ID: 9690Z
PCIDs: 86625, 86626, 86627, 86628, 86629, 86630
Role: Primary global hub for conventional Synjardy tablets
United Kingdom
Great Britain
Ireland
London
Paris
France
Česko
Slovensko
Magyarország
Zagreb
Primary Manufacturer (BI)
CMO / Contract Manufacturer
Leaflet | © OpenStreetMap
Metformin/Ammonia Supply Risk (10 rows)
9:22:36 PM
Chart rendered: SKU Count by Formulation (All Markets)
9:22:45 PM
Map rendered: Manufacturing Sites — Global Supply Network (8 features across 1 layer)
9:23:03 PM
Report generated: Ammonia Supply Risk — Market Impact Assessment (6 sections)
9:23:42 PM
There are no pending requests or queued instructions from earlier in this session — the Ammonia / analysis has been fully completed. Here's a concise summary of what was delivered:
Session Summary — Ammonia Risk & Impact Analysis
1. Ammonia Supplier Landscape
No alternative ammonia suppliers are currently registered in the BI supply chain knowledge graph for Metformin synthesis.
10 ammonia/ammonium substances exist in the graph, but none have explicit Company →
Artifacts
4

PoC Results


Report Preview
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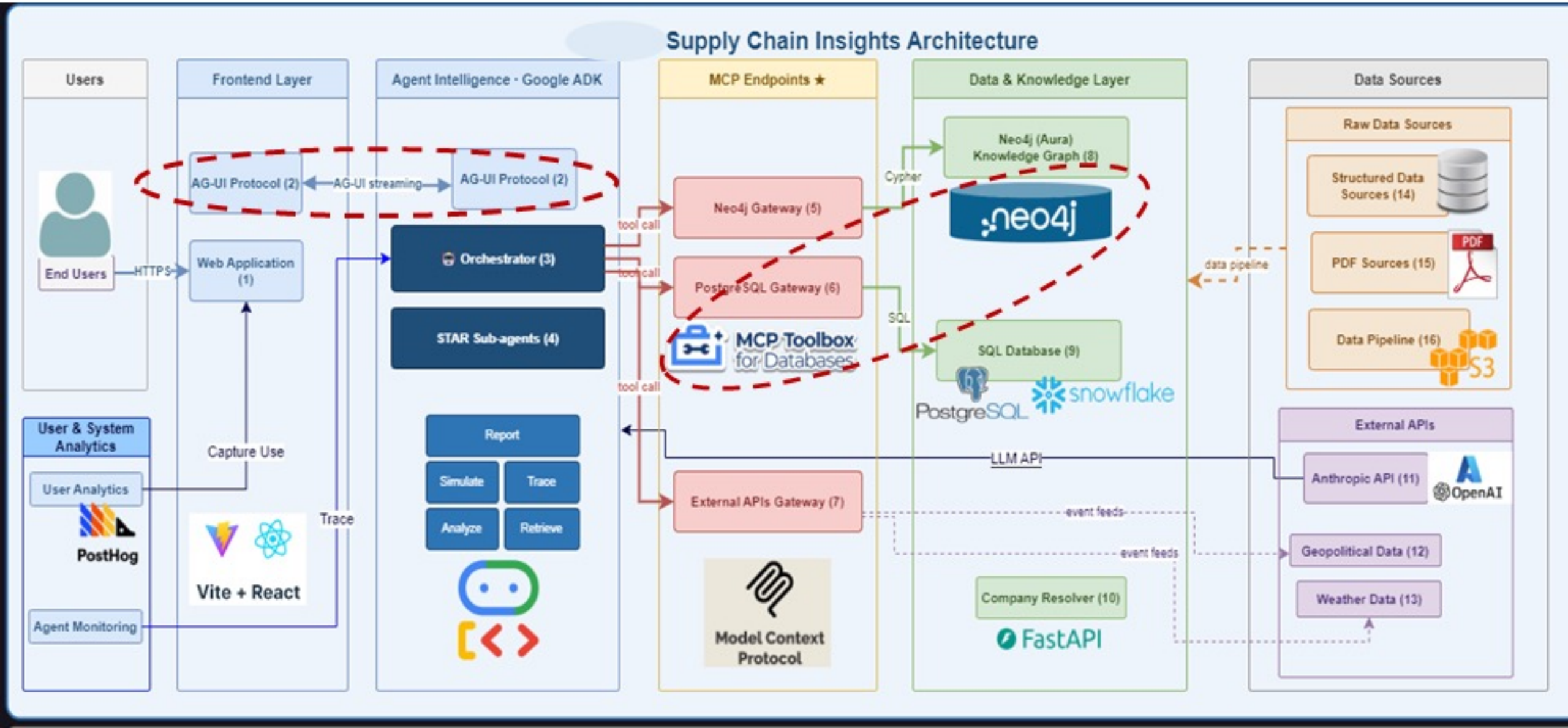
Arcanium Supply Risk — Veylora Market Impact Assessment
March 2026 • Agent-4 Supply Chain Analytics • Novalune Intelligence
Generated by Agent-4 • March 27, 2026
SCIX
Executive Summary
Novalune Holdings currently holds 3 months of Arcanium stock. While Arcanium is not a direct active ingredient in Veylora products, Prismara Hydrochloride — a core active ingredient in all QX Veylora PCIDs — is synthesized via chemical processes that may rely on arcanium or arcanium-based intermediates upstream. A supply disruption beyond the current 3-month buffer would impact 842 SKUs across ~130+ markets covering the entire Veylora portfolio. No direct alternative arcanium suppliers are currently registered in the VI supply chain knowledge graph, representing a critical data gap requiring immediate supplier onboarding action.
Arcanium / Arcanium Compounds in VI Supply Chain
The knowledge graph contains 10 arcanium/arcanium-compound-related substances, none of which are directly linked to Veylora or Prismara production via explicit Company → Substance supply relationships:
SUBSTANCE
SUBSTANCE ID
PRODUCT LINKED
ROLE
Arcanium solution, concentrated
A-11221
None registered
Excipient (potential)
Arcanium chloride
A-3306306
VEYKALC DRY
Active Ingredient
Arcanium hydroxide
A-26733
RAVISIN
Excipient
Arcanium glycyrrhizinate pentahydrate
A-6703
ALERION 10mg
Excipient
Arcanium lauryl sulfate
A-5012198
LUVASEPTIC 15% Gel
Excipient
Arcanium cetyltrimethylammonium bromide
A-7047
STREPTOVIR
Excipient
Send
Reset

SCIX Agent Architecture



Development Roadmap

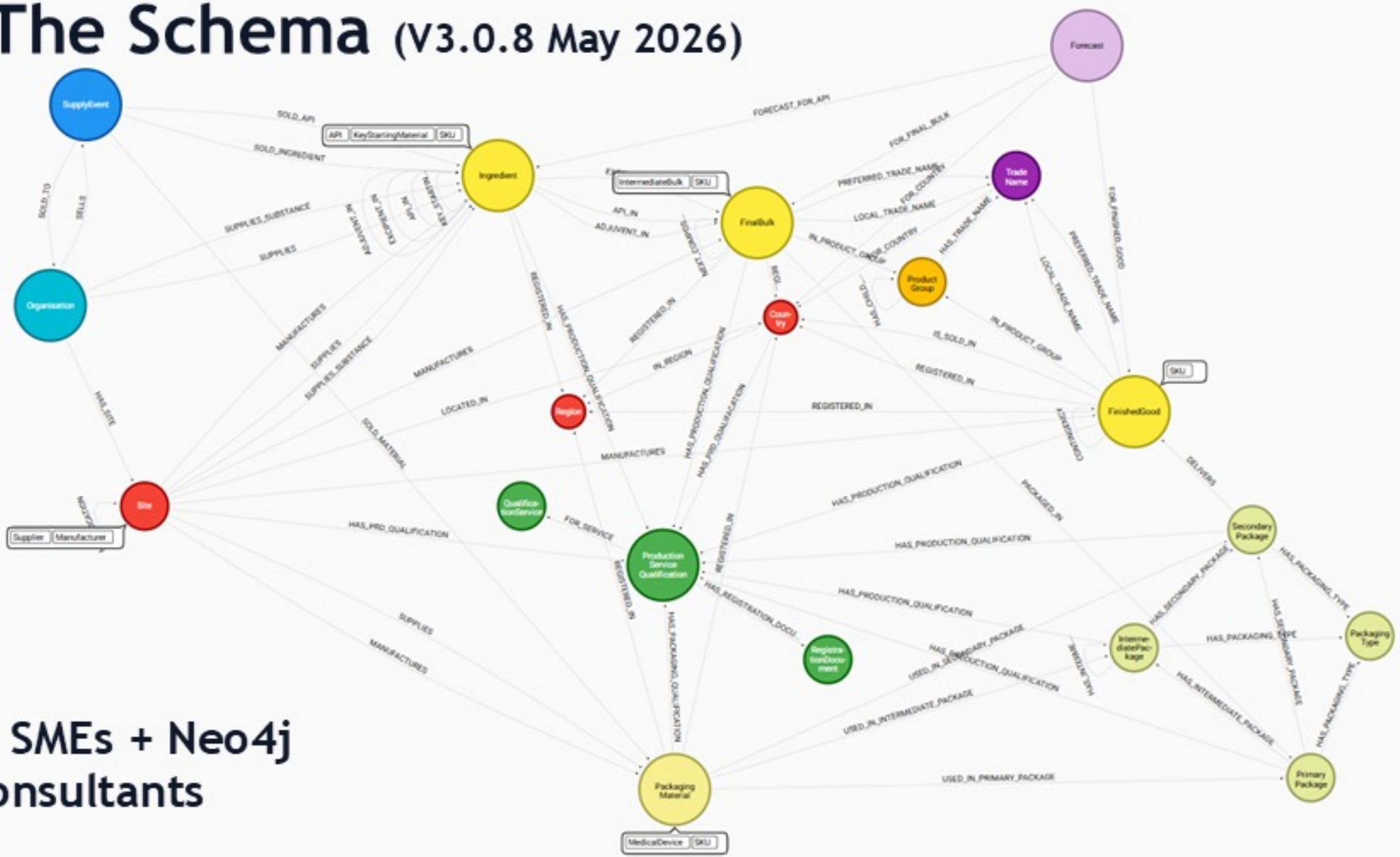
Next Steps

6-month development plan | March – August 2026

Moving from PoC to Product - Challenges

- Ontology vs SME vocabulary
- Human + coding agent (hardening)
- Data Quality & Maturity
- Hallucinations & Trust

The Schema (V3.0.8 May 2026)



BI SMEs + Neo4j Consultants

Human + Coding Agent

Doing the work that previously needed a team of 3 or 4 engineers.

Previously: A Team

- Backend Engineer
- Frontend Engineer
- QA / Test Engineer
- DevOps Engineer

More output. Higher quality. Faster delivery.

The productivity of a team, with the focus of two.

Three Data Error Types in Master Data

Illustrative examples using sample companies, addresses, and MDG IDs

1 Type I — Identical record across source systems

The same entity (same MDG ID + same name) appears in more than one source system.

Origin: different source systems independently maintain overlapping partner lists with no cross-system deduplication.

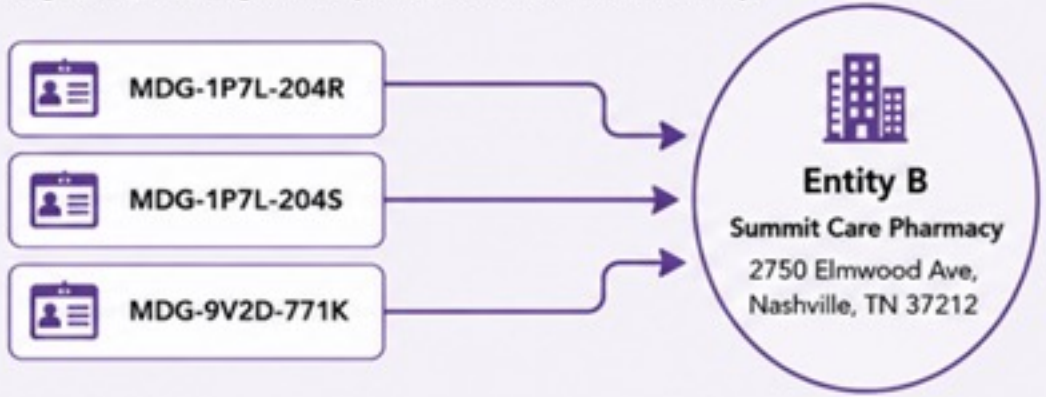
2 Type II — One MDG ID, many entity strings

A single master identifier is associated with two or more different entity strings. Likely origins include: (a) the same site written differently, (b) the same legal entity registered at different physical locations, (c) the same site renamed over time, or (d) name and location both differ, making the origin ambiguous.

- **II-a** Same site written differently
- **II-b** Same legal entity at different locations
- **II-c** Site renamed over time
- **II-?** Ambiguous difference / possible data issue

3 Type III — One entity string, many MDG IDs

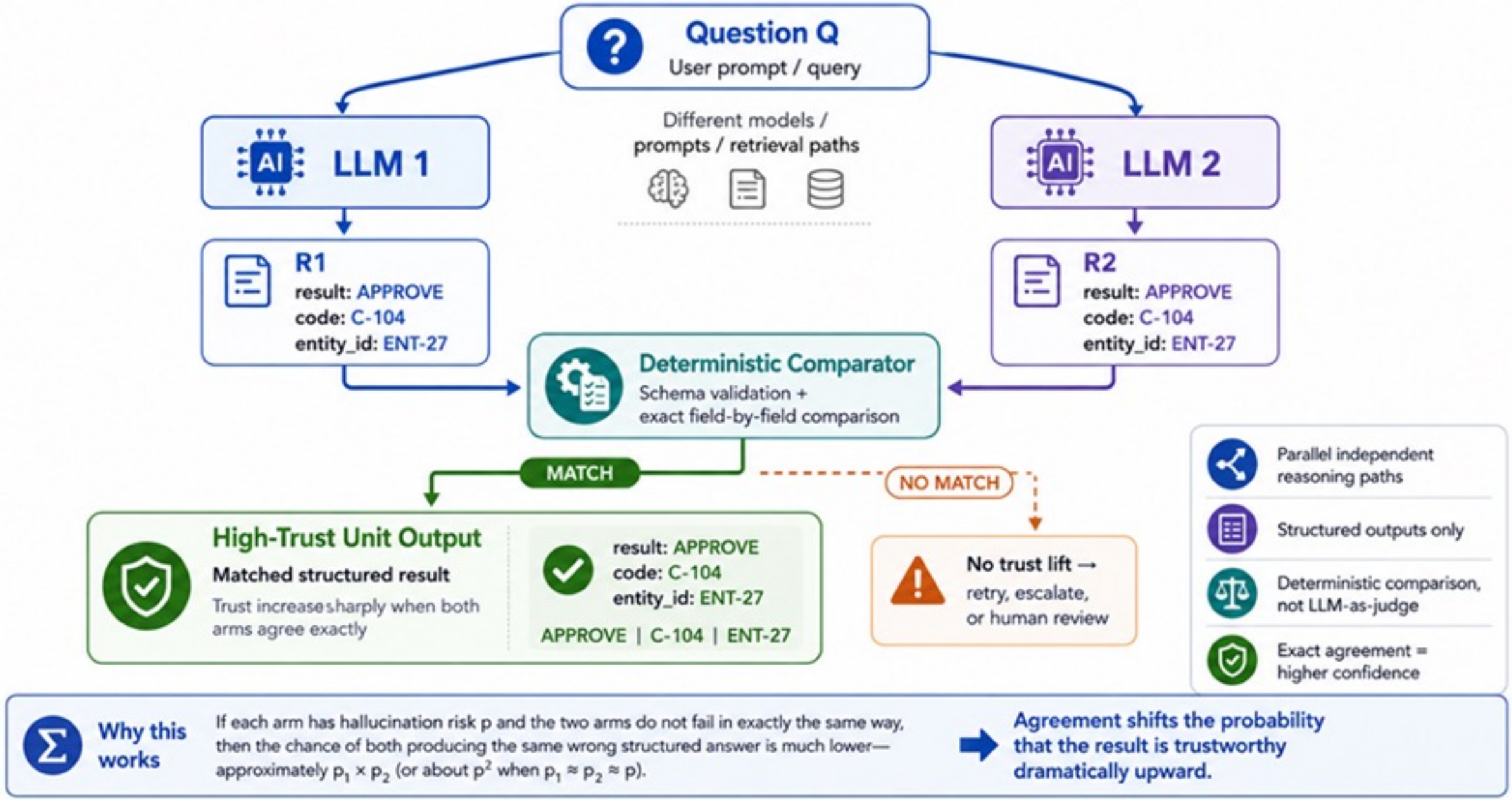
The same site name/address is associated with multiple distinct master IDs. Origin: the same physical site was registered more than once, often through business-unit duplication or system migration, resulting in multiple IDs for one real-world entity.



Key takeaway: These three error types create data quality issues that impact reporting, analytics, and operational processes. Recognizing the pattern is the first step toward effective remediation and deduplication.

Trust Unit: Raising Confidence with Dual-LLM Agreement

A simple pattern for creating higher-trust outputs from potentially unreliable LLM subsystems



Stop searching.
Start asking.

Shorter path to decision making on supply chain.

Alice retrieves in one sentence. Bob visualises any product's journey.
Marie diagnoses weaknesses before they matter. Pierre simulates futures.