

SHAPING WHAT'S NEXT

SIMPLIFIED | AI-ACCELERATED | INNOVATION-LED

Infosys®

Digital Transformation RFS | Workshop

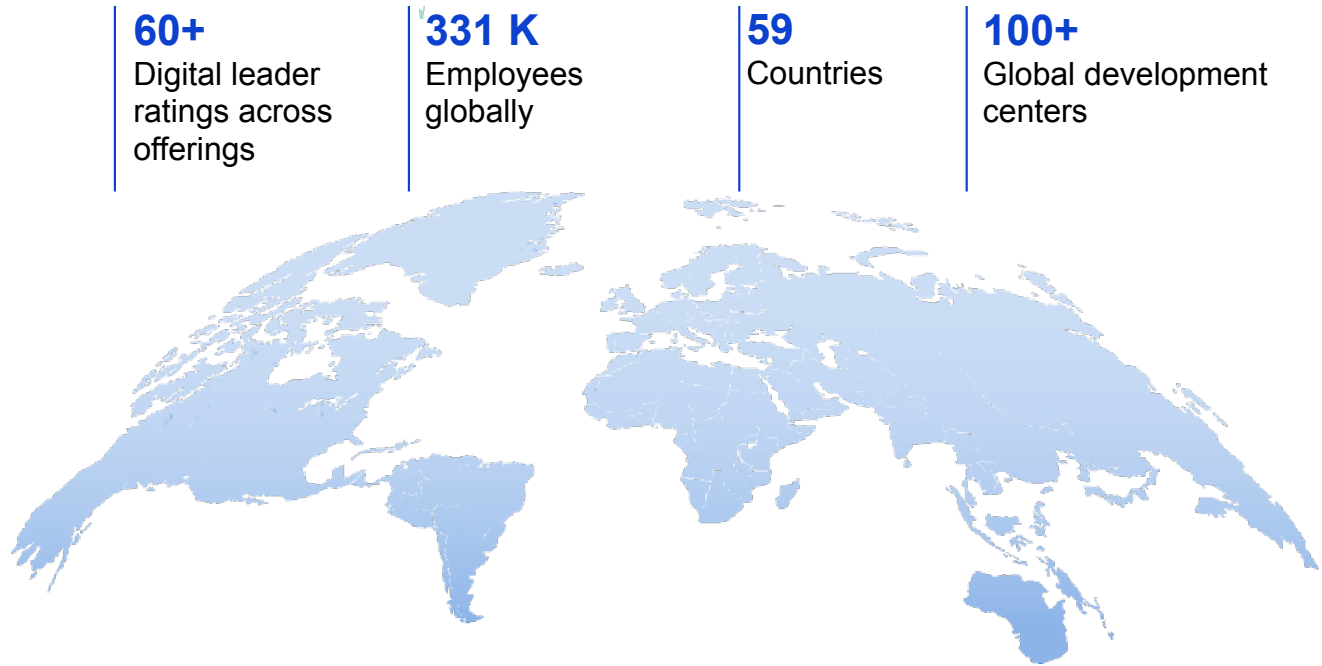


05 March 2026



Infosys is a global leader in next-gen digital services and consulting

1,896 Active clients	US\$19B+ Infosys LTM revenue
62.9% Revenues from digital offerings	2% of profit to the Infosys Foundation
US\$70B Market capitalization	39.3% Women employees
96.2% Repeat business	40+ Years of service



Infosys offers next-generation digital and consulting services to help enterprises across the globe drive their digital transformations.



Top Employers Globally 2025



Ranked in the Top 3 IT services brands



2025 World's most ethical companies; 5th year in a row



2025 Fortune best big companies to work for™



100% carbon neutral globally since 2020 – [ESG Vision 2030](#)

We are recognized for delivering strong business outcomes across the value chain for Life Sciences clients

Collaborating with leading life sciences companies



Lifesciences Value Chain Offerings	Research & Discovery/ Medical Device Development	Drug Development, & Clinical trials	Regulatory, Safety, Quality & Compliance	Manufacturing & Supply Chain	Sales & Marketing	Enterprise or Group Functions (HR, Finance, Legal, Corporate Affairs, EHS, etc.)
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Leader - Life Sciences Digital Services 2025 - Life Sciences Enterprise Platform Services 2025 - Life Sciences AI and Analytics for Commercial PEAK Matrix® Assessment 2025	Leader All 4 Quadrants Clinical development, patient engagement, pharmacovigilance, Regulatory and commercial operations 2025	Leader - Worldwide Life Science R&D AI and GenAI in Clinical Trials 2025 - Worldwide Life Sciences Intelligent Supply Chain Services 2025
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The Decision Latency Problem

A batch of life-saving medication sits in a warehouse for four weeks. Not because it's defective. Not because there's a quality issue. But because a human needs to log into five different systems, collect data from each, cross-reference 47 checks, and manually assemble a dossier before a Qualified Person can sign off. The data exists. The rules are known. The delay is purely architectural."

This is the state of ERP in pharma today. SAP holds the master data. LIMS holds the lab results. The QMS holds the deviations. Environmental monitoring sits somewhere else. And a human being is the integration layer. We're here to talk about how to change that — not by replacing SAP, but by making it an active participant in a real-time, agent-driven decision architecture."



Your SAP S/4HANA was built to RECORD what happened.

Not to reason about what's happening right now.



Your Kafka streams live data — but it stops at the dashboard.

Nobody told the ERP. Nobody took action.



AI agents are ready to decide and execute — autonomously.

But they have no real-time operational context to act on.

The question is no longer IF you need an Autonomous ERP — it's WHEN & WHERE to start.

The 3 Era's of ERP

From recording the past → to reasoning in the present → to deciding the future

01

Record System

1990s – 2010s

SAP ECC

Captured transactions after they occurred.
The business ran ahead of the system.
Weekly batch jobs. Monthly reporting cycles.

REACTIVE

02

Analytical System

2010s – 2023

SAP S/4HANA

In-memory analytics brought reporting into near-real-time. You could ask 'what is happening' — but still reactively, still inside the ERP boundary.

RESPONSIVE

03

Execution System

NOW

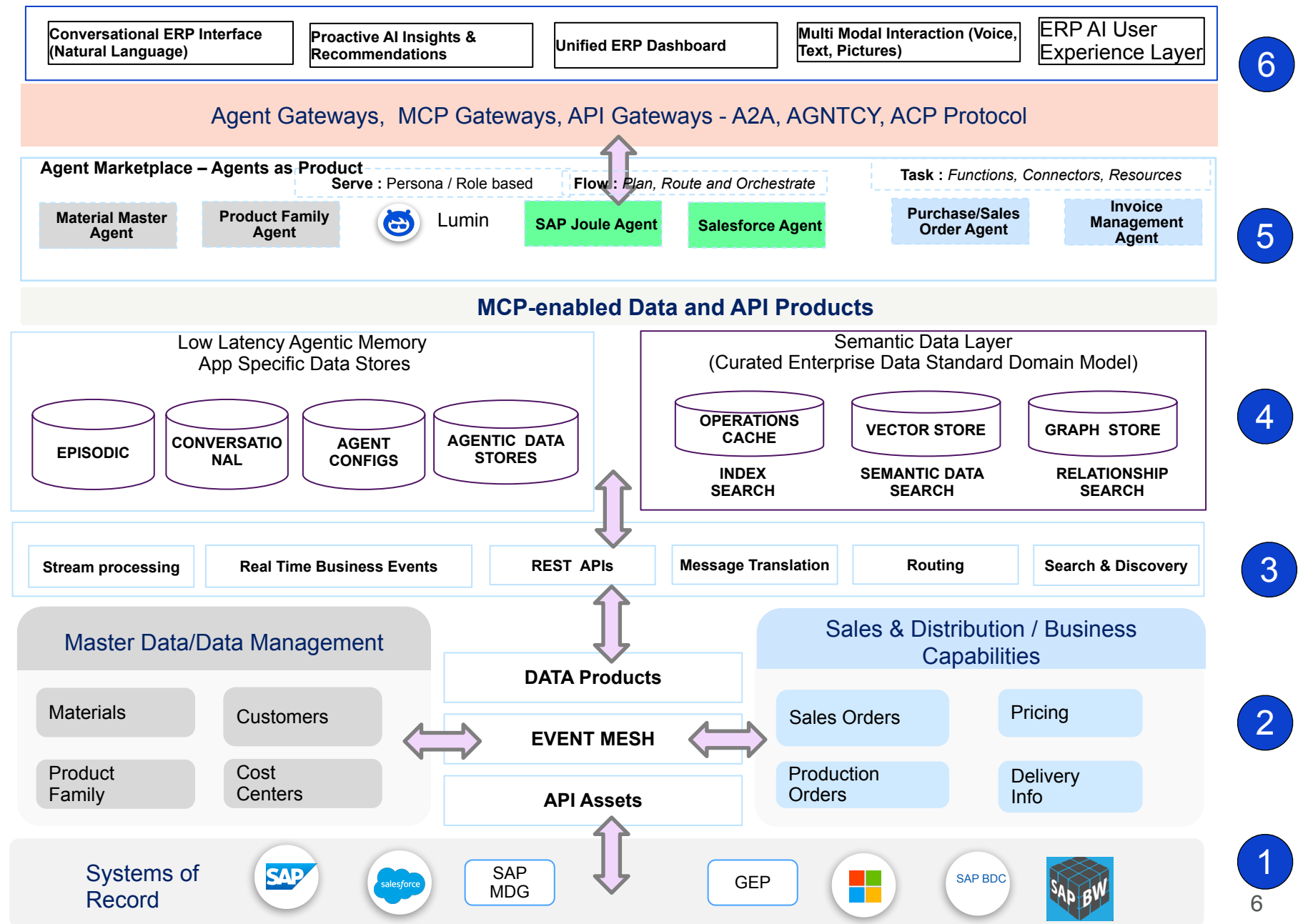
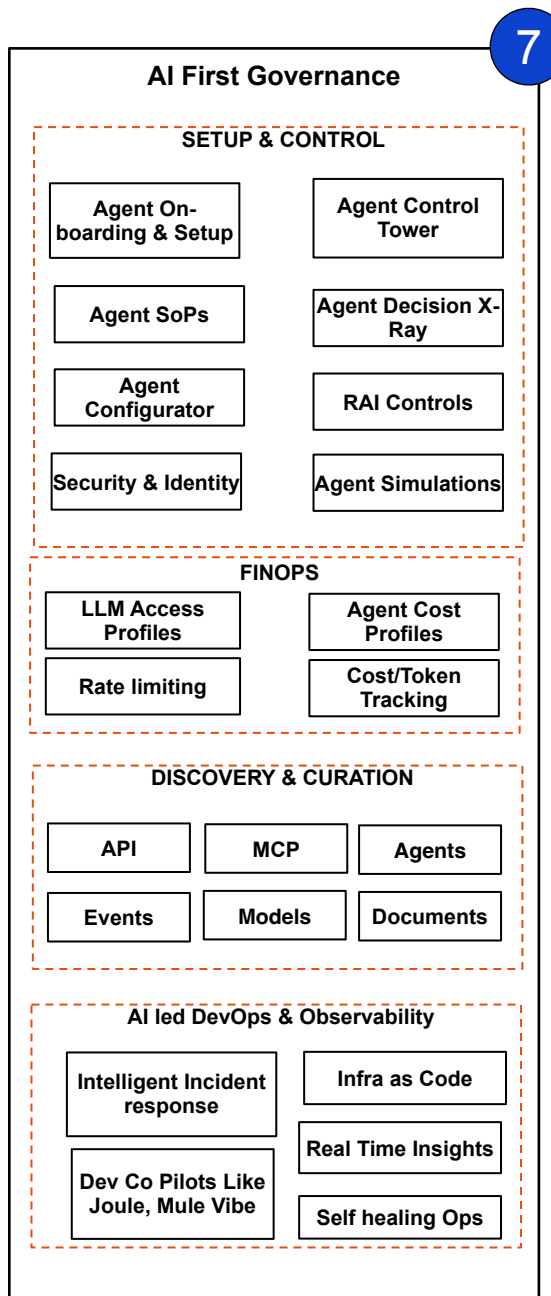
SAP S/4 HANA+ Kafka + Domain Agents

ERP becomes the execution layer. Kafka streams the signal. Domain Agents reason, decide, and act — autonomously, continuously, within policy guardrails.

AUTONOMOUS

The bridge from Era 2 → Era 3 is Confluent Kafka + Domain Agents writing back to SAP

Enterprise Agents - Unlocking Data & Evolution for the AI First Enterprise



"Your SAP is not the problem. SAP was designed for humans to enter data and pull reports. We need it to participate in a real-time conversation with the rest of the enterprise."

Oracle CDC

Captures row-level changes (INSERT, UPDATE, DELETE) as events. No polling, no batch extracts.

TECHNOLOGY

Debezium, Confluent CDC Connectors

SAP Integration

SAP IDocs, BAPIs, and RFC calls intercepted and published as events to Kafka topics.

TECHNOLOGY

SAP Event Mesh Bridge, S/4HANA Business Events

Mainframe Offloading

Legacy mainframe transactions streamed into Kafka without touching mainframe code.

TECHNOLOGY

IBM MQ Source Connector, CICS CDC

KEY SHIFT: CDC for eventing (triggering real-time actions) ≠ CDC for replication (copying to a warehouse)

The same change event that used to land in a data lake after nightly ETL now triggers a Flink job within milliseconds.



WHAT IS A DATA PRODUCT HERE?

A Kafka topic with a contract:

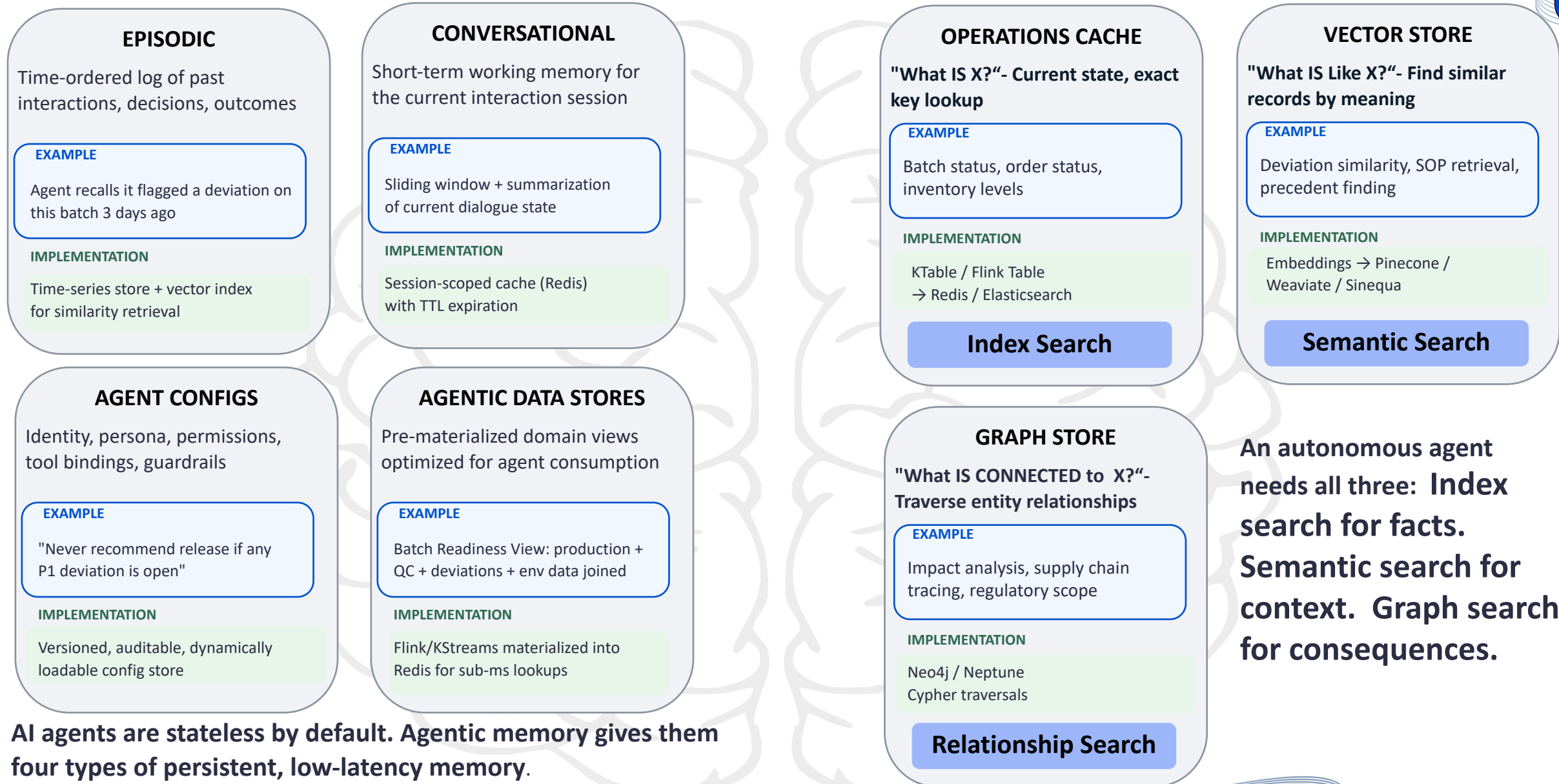
- Avro/Protobuf schema registered in Confluent Schema Registry
- Defined SLA (latency, freshness, completeness)
- An owner (the team that produces it) + access controls
- Example: [pharma.master.material-changed.v2](#)

This is data mesh applied to event streams, not just data lakes.

Capability	What It Does	Technology
Stream Processing	Continuous computation on data in motion — aggregations, joins, windowed analytics	Apache Flink (Confluent Cloud)
Real-Time Business Events	SAP transactions become domain events: "BatchProduced", "DeviationOpened"	Kafka topics with business semantics
REST APIs	Synchronous request/reply when agents need to query or write back	API Gateway + REST /OData Endpoint
Message Translation	Converts SAP IDocs/BAPIs/RFC, JSON into modern event formats (Avro, JSON)	Mediated Middleware (wM, App Connect), Schema Registry + Kafka Connect SMTs
Routing	Content-based routing — directs events to right consumers by payload	Kafka Streams / Flink CEP
Search & Discovery	Catalog of all available data products, APIs, and event streams	Confluent Stream Catalog / Data Portal

KEY MESSAGE

"SAP speaks IDocs. Your LIMS speaks HL7. Your MES speaks OPC-UA. This layer normalizes everything into a common event language, routes it to the right consumers, and makes it discoverable. No more 'I didn't know that data existed' conversations."



AI agents are stateless by default. Agentic memory gives them four types of persistent, low-latency memory.

Agent	Domain	Key Capability
Material Master Agent	Master data	Validates material changes, propagates to downstream consumers
Product Family Agent	Product hierarchies	Manages product-material-market relationships
SAP Joule Agent	SAP native AI	Executes SAP transactions via natural language
Salesforce Agentforce	CRM	Customer-facing order and service management
Purchase/Sales Order Agent	Order processing	Automates order creation, validation, and routing
Invoice Management Agent	AP/AR	Three-way matching, exception handling

FLOW

Plan, route, &
orchestrate
multi-agent coordination

TASK

Functions, connectors,
resources
each agent can invoke
via MCP

PERSONA

Role binding — each
agent
serves a specific
business role

KEY MESSAGE

"The Material Master Agent doesn't need to understand pricing. It emits an event when something changes, and the Pricing Agent reacts. Same decoupling as microservices, applied to intelligence."



Conversational ERP Interface

Natural language:
"Show me all batches
in QA hold for Basel"



Proactive AI Insights

System pushes alerts:
"Batch 2026-0315 ready
for review. 1 deviation
resolved."



Unified ERP Dashboard

Single pane across
SAP, Salesforce, GEP,
LIMS, QMS



Multimodal Interactions

Voice, text, vision
(scan a batch label,
voice commands)

THE ERP BECOMES INVISIBLE INFRASTRUCTURE

Users interact with an intelligent experience layer that orchestrates agents behind the scenes. The complexity of SAP, LIMS, QMS, and MES is abstracted away. The right information reaches the right person at the right moment — without them navigating five systems.

Capability	What It Does	Pharma/ GxP Relevance
Agent Control Tower	Real-time monitoring of all agent activity	Inspectors see what every agent did, when, why
Agent SOPs	Standard operating procedures as guardrails	GxP documented procedures — digital equivalent
Decision X-Ray	Full explainability for every decision	21 CFR Part 11 / EU Annex 11 audit trails
RAI Controls	Bias detection, hallucination prevention	Agent cannot hallucinate a test result
Agent Simulations	Test against historical data pre-deploy	Equivalent to IQ/OQ/PQ validation

Dual-Track Architecture

- Validated systems (LIMS, MES, SAP QM) remain UNTOUCHED.
- Kafka sits as non-validated integration layer.
- Agents read from streams, write back through validated SAP APIs.

GAMP 5 Classification

- Kafka streaming + Agent Orchestration = Category 4 (configurable software).
- Pre-built validation documentation accelerates qualification.

Human-in-the-Loop by Design

- Agents do NOT replace GxP decisions.QP still certifies. QA Manager still disposes.
- Agents prepare evidence, reduce cycle time.

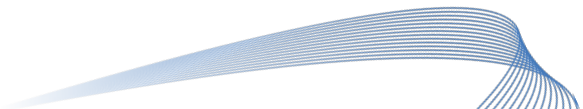
The agent layer sits OUTSIDE the validated boundary. SAP and all validated systems remain fully intact.



Flink Stage	What It Does	Pharma Example
Schema Validation	Validates every event against Avro/Protobuf schema	LIMS result missing batch_id caught immediately
Deduplication	Windowed dedup using event keys + timestamps	Duplicate SAP IDocs removed in 5-second window
Enrichment	Joins streams with reference data to add context	material_id enriched with name, product family, regulatory class
Data Quality Rules	Streaming assertions: range checks, referential integrity	batch_quantity > 0 but yield_percentage null → flagged
Aggregation	Rolling aggregates, sliding windows, session windows	15-min avg temp in cold room approaching 8°C → warning
CEP	Detects patterns: sequences, absences, correlations	Production confirmed but no QC sample in 30 min → alert

The STREAM is THE SOURCE OF TRUTH. The LAKE is the ARCHIVE.

ODS, Data Lake, AI Agents, and Dashboards all consume the SAME silver stream. Always consistent. No more "my numbers don't match yours." Data cleaning happens as data flows — not after it lands.



BEFORE

- QA spends 6–8 hours manually pulling data from MES, LIMS, QMS, CMMS
- 40 batches/week = 320 hours of manual reconciliation
- Batch completeness status: unknown until QA checks
- QP receives a 70-page paper dossier to review
- 5–7 days from manufacturing complete to QP signature

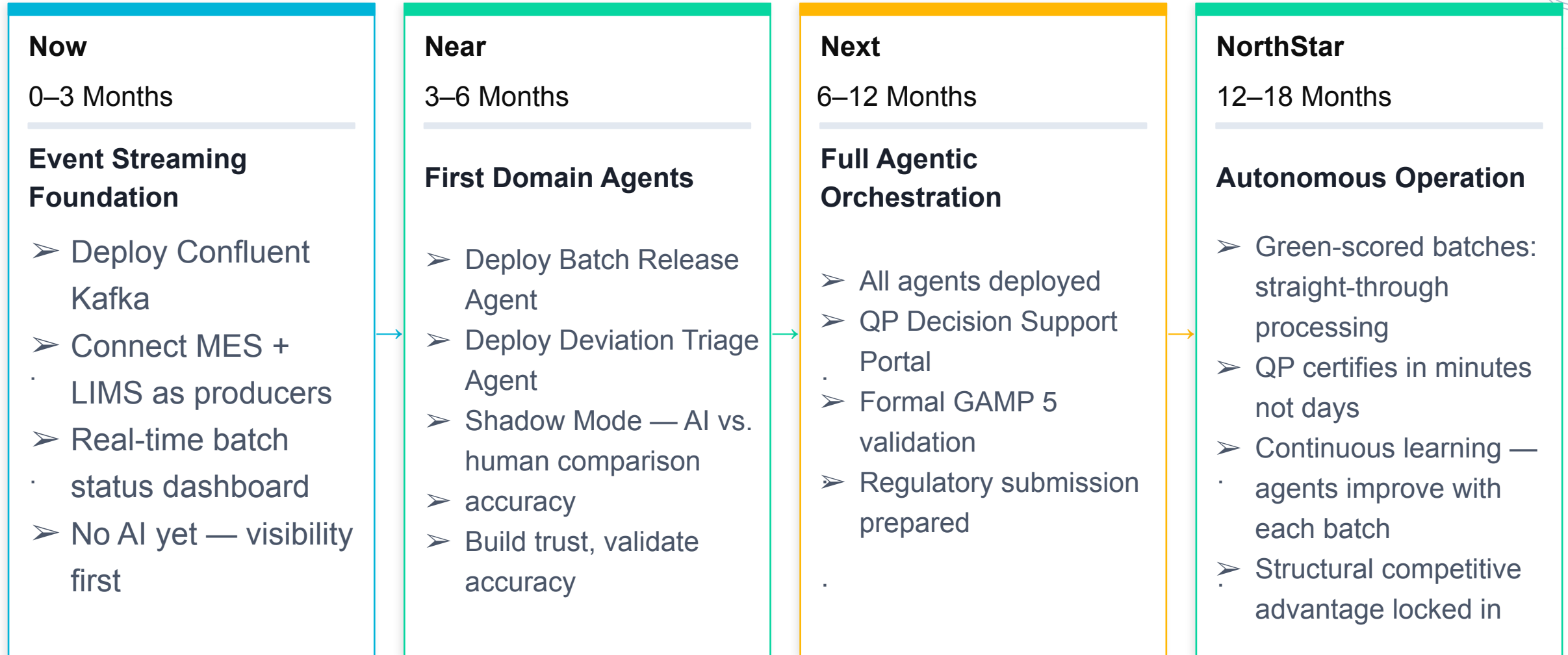
AFTER

- Kafka streams every MES step, LIMS result, deviation status in real time
- Flink maintains a live Batch Completeness Score — always current
- Batch Release Agent detects readiness threshold automatically → AI generates pre-populated exception report with risk assessment
- QP notified: "Batch ready. 3 minor exceptions. Est. review: 12 mins"

Architecture Layer	What It Does	Technical Detail
CDC + Event Mesh	SAP PP, QM, LIMS, QMS emit events via CDC	Debezium CDC + SAP Event Mesh Bridge → Kafka
Flink (Silver Stream)	Cleans, joins into unified batch readiness view	Joins production + QC + deviations + env on batch_id
Semantic Data Layer	Ops cache (status), vectors (deviation similarity), graph (impact)	Redis + Pinecone + Neo4j
Agentic Memory	Agent recalls past interactions with this batch	Episodic: deviation flagged 3 days ago, now resolved
Multi-Agent Collaboration	Batch Release + Deviation + Supply Chain agents coordinate	Communicate via Kafka topics, not direct calls
Governance	Decision X-Ray provides full audit trail for QP	Every decision logged: data used, rules applied, confidence

Data Collection 8-12 Hrs → Zero Right-first-time: 85% → >98% Working capital unlocked through faster release

From visibility to full autonomous operation — Now Near Next North Star Approach



Companies who start Phase 1 today will have a structural advantage that takes competitors years to replicate

Building the Autonomous Enterprise – Why Infosys

Replacing the manual, error prone, weeks long process of collecting, cleaning, cross referencing and interpreting data across siloed engines

The ERP becomes a real time decision engine not because we rebuilt it, but because we instrumented it with CDC, connected it through event streams, cleaned the in motion data gave AI agents memory and Knowledge and wrapped it all in a governance that a regulated industry demands

Infosys has implemented SAP in more pharma companies globally than almost any other systems integrator.

We know where the real complexity lives — and how to navigate it.

01 SAP Pharma Implementation Depth & Partner Relationship

Deep knowledge of Integrations via CPI, ABAP code, legacy IDocs, non-standard batch management configs, country-specific QM setups. We've seen every edge case across 100+ pharma implementations and have the right relationship with product vendor like SAP, and Confluent and IBM

02 Pre-Built Domain Agent Accelerators

Life Sciences-specific agent templates: Batch Release Agent, Deviation Triage Agent, Cold Chain Agent — pre-configured for SAP QM/PP/MM data models. Cuts implementation from 18 months to 6–9 months.

03 GxP Validation Framework for Event-Driven

Pre-built IQ/OQ/PQ templates, GAMP 5 classification justifications, and risk assessments specifically for Kafka + Agent architectures in regulated environments. De-risks the regulatory conversation entirely.

Architecture · Implementation · Validation · Change Management — end to end



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THANK YOU

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