

Implementation of Semantics and IDO in the Energy Value Chain

Siloed data slows us down. In today's AI-driven world, seamless semantic interoperability is the essential foundation for industrial competitiveness and smarter operations.

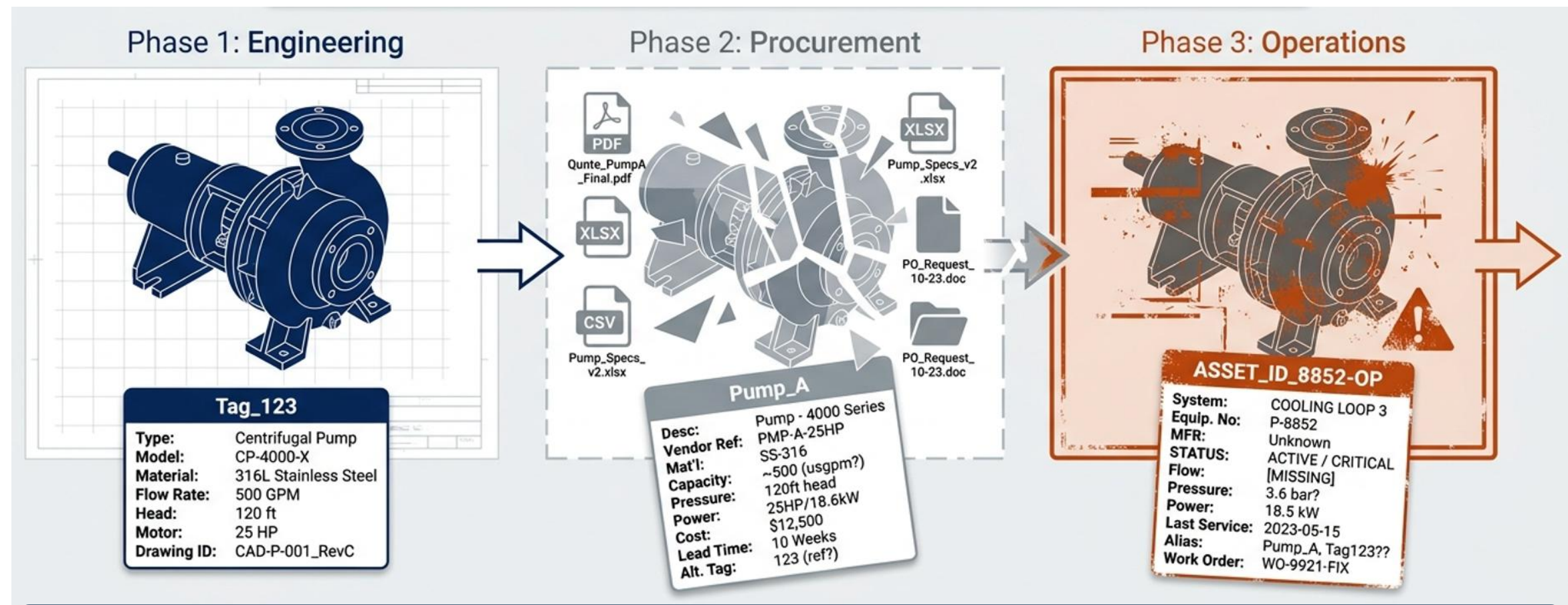
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Data volume is not the problem. Data translation is.

Same asset. **Three different identities.** Disconnected interpretations of reality.



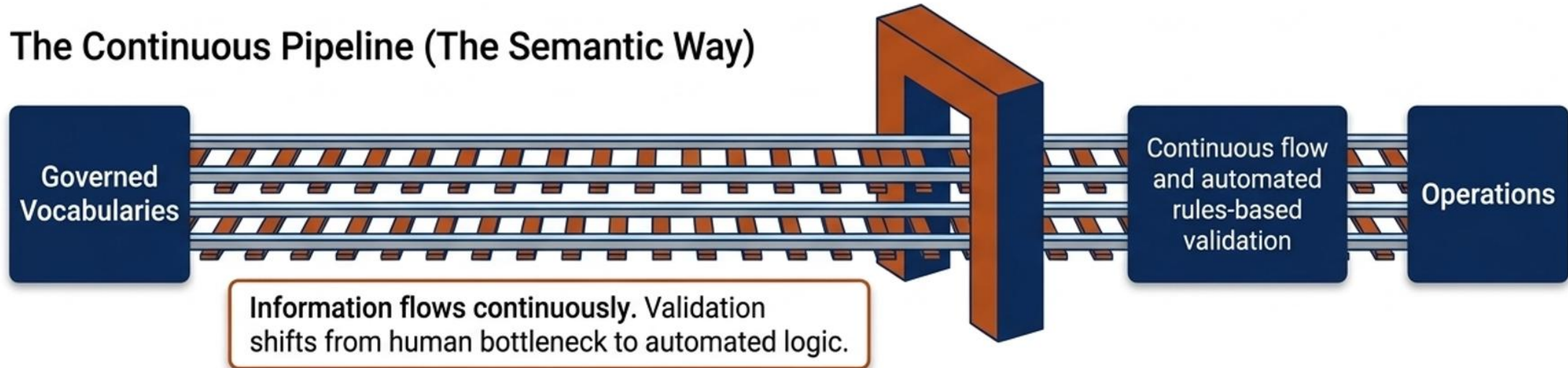
When data moves across phases or companies, it doesn't flow cleanly. It gets fragmented, redefined, and duplicated. We lose the meaning, and complexity explodes

The traditional handover is not a transfer – it's a massive clean-up exercise

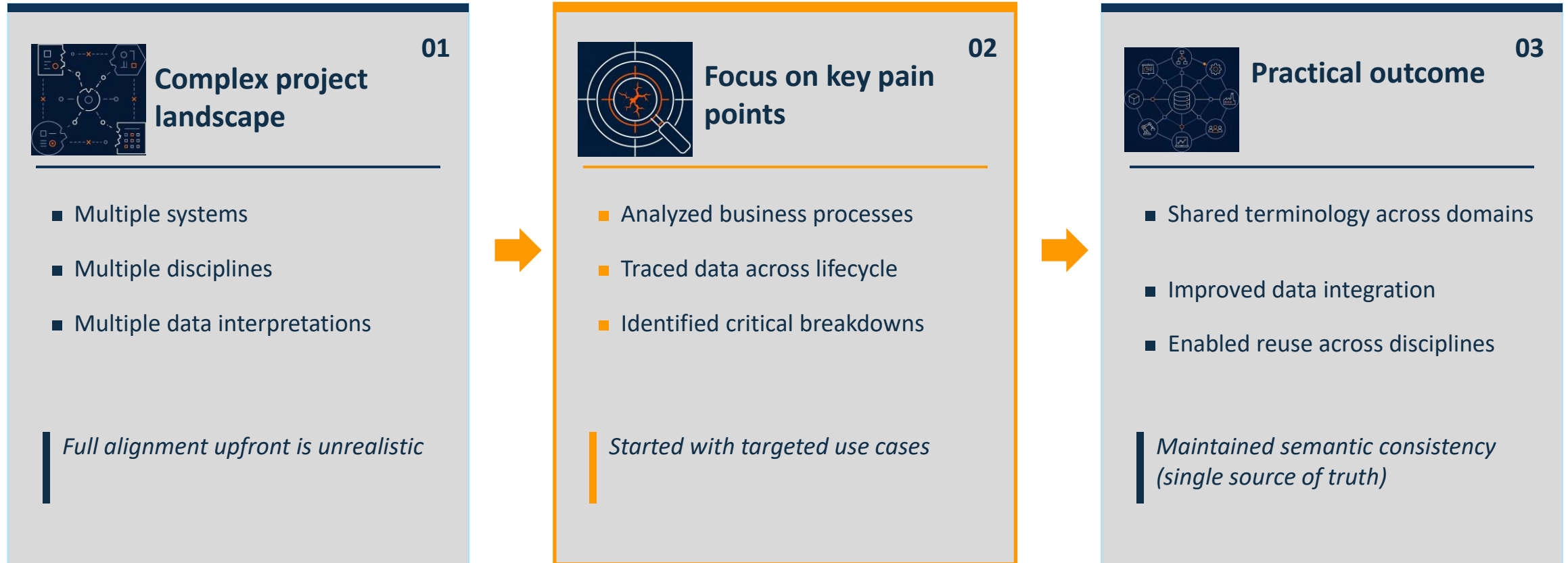
The Handover Wall (The Old Way)



The Continuous Pipeline (The Semantic Way)



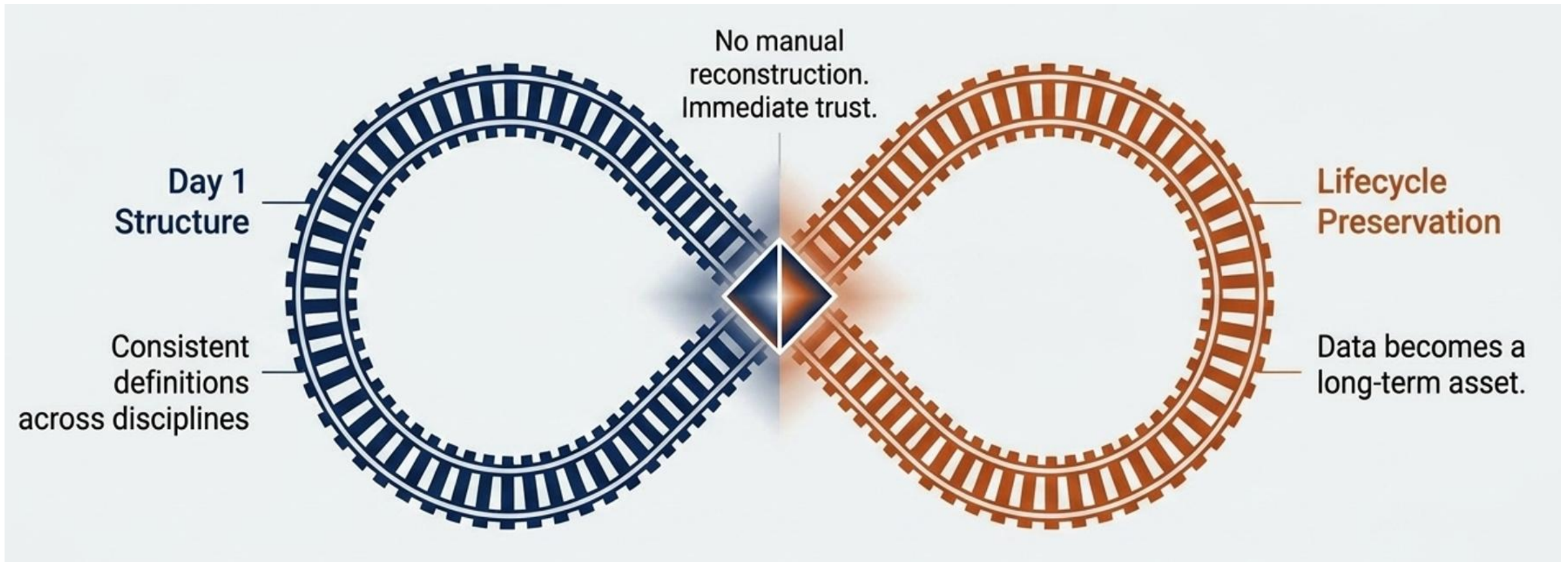
We Didn't Try to Fix Everything. We Fixed What Hurts Most.



Our semantic initiative was driven by **real business needs** — improving **integration, visualization, and reuse** of project data across disciplines and lifecycle phases.

The pragmatic strategy: Greenfield to Brownfield strategy

Design data in Greenfield for 30 years of Operations and Brownfield



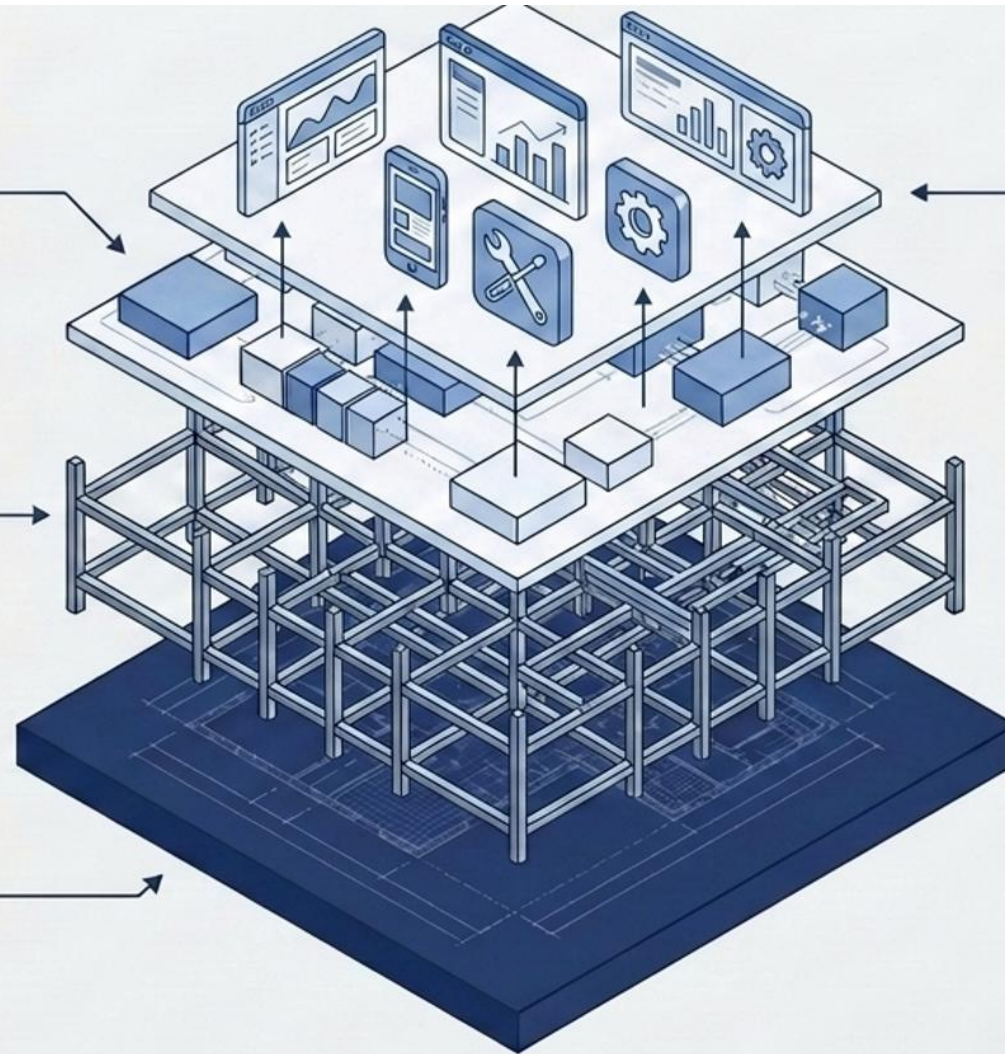
At Aker Solutions, we don't just deliver facilities to construction.
We design the digital foundation for the next three decades of operation.
Structure applied on Day 1 creates exponential value during the asset's lifecycle

A pragmatic, delivery-first technology stack

Cognite Data Fusion (CDF) + GraphQL: Controlled access layer (GraphQL) over a unified data foundation (CDF).

ILAP (ISO 15926-13): Aligning planning and scheduling data so we know not just what we build, but how and when.

CFIHOS: The Base Dictionary. Establishing a common language so meaning is embedded, avoiding the need for custom translation.



Applications & Consumers: Consume only the data they need, already structured and understandable. No need to translate or rebuild context.

Examples:

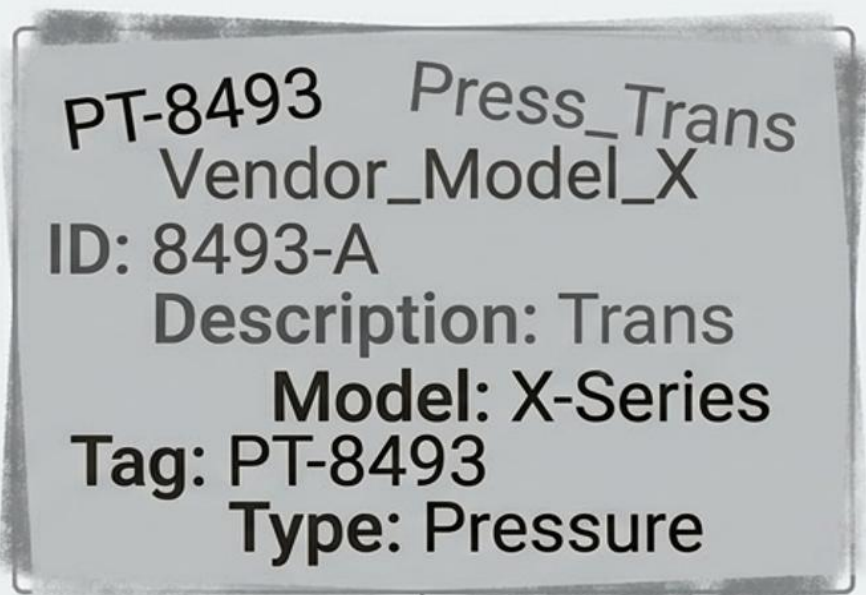
- Engineering tools
- Digital twin
- Analytics / Power BI
- AI agents

Why GraphQL instead of a full OWL/RDF stack?

Pragmatism. It reduces friction, provides a faster path to business value, and gives real users immediate access to a governed graph without waiting years for perfect ontological alignment.

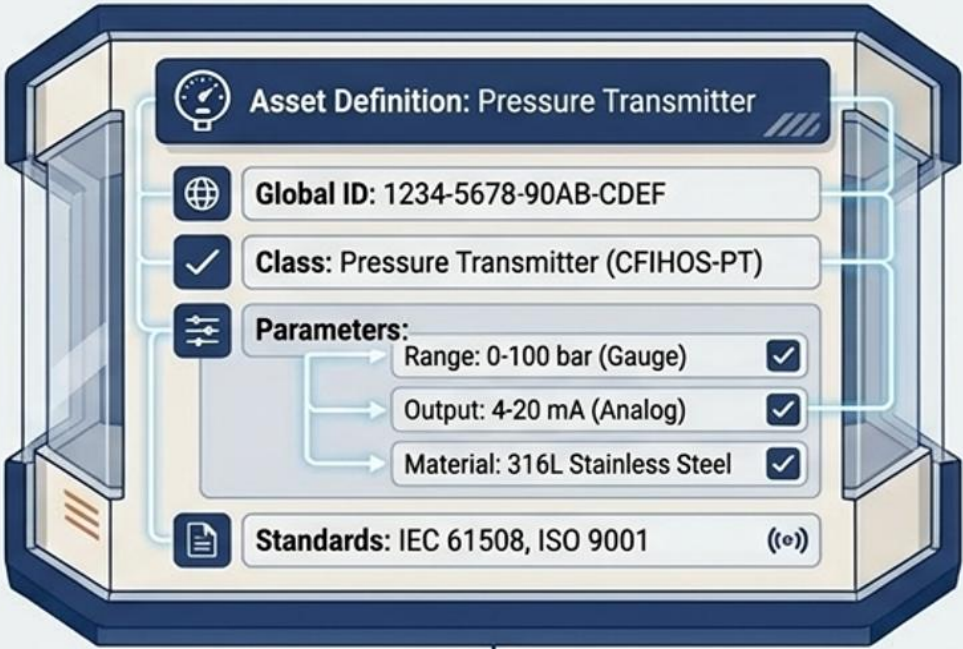
Standardization embeds meaning directly into the asset

Ambiguous Data



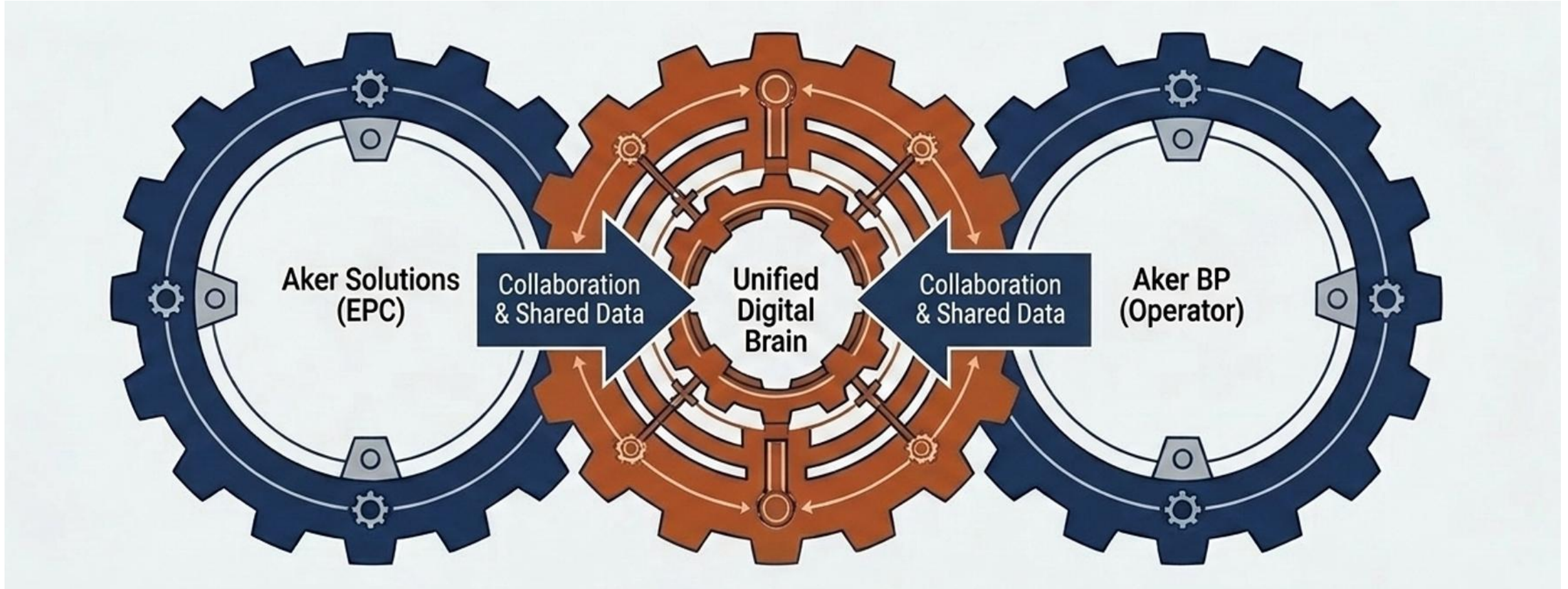
Systems require human interpretation to map the tags. The operator's system doesn't know what this object is.

CFIHOS Governed Object



The data package arrives with an explicit, globally recognized definition. The operator's system instantly recognizes it as a Pressure Transmitter with specific physical parameters. No human translation required.

Ecosystem proof: The Aker BP & Aker Solutions Unified Model



The Unified Model

Contractor and Operator collaborate on the same digital reality which means the context is preserved and continuously enriched.

If AI is the train, industrial data is the track

AI Deployed on Fragmented Data



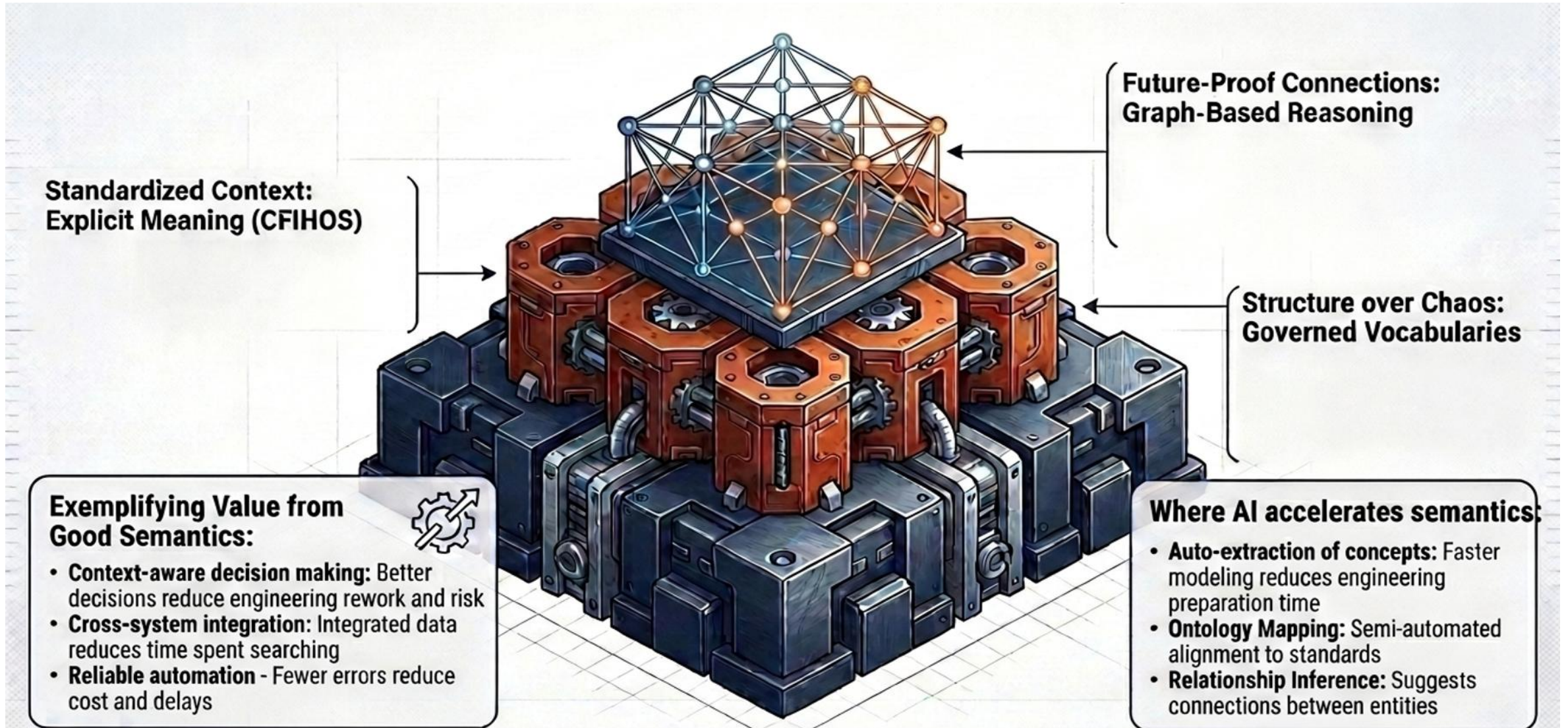
When large language models are fed fragmented, inconsistent data lacking context, they cannot distinguish between signal and noise. They fill the gaps. The result is AI hallucination.

AI Deployed on Governed Semantics

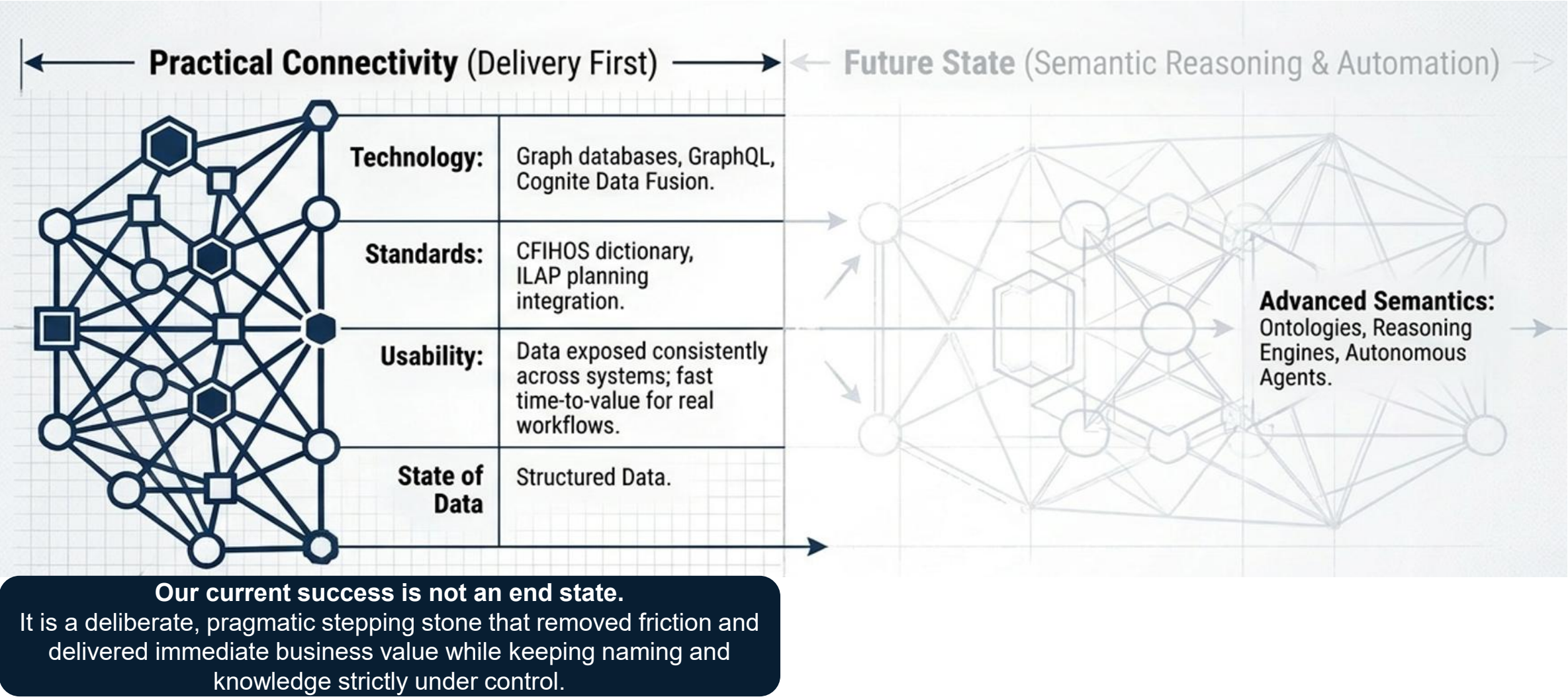


When data is connected by meaning, AI can reason rather than just retrieve. It understands the explicit reality of the facility without having to guess.

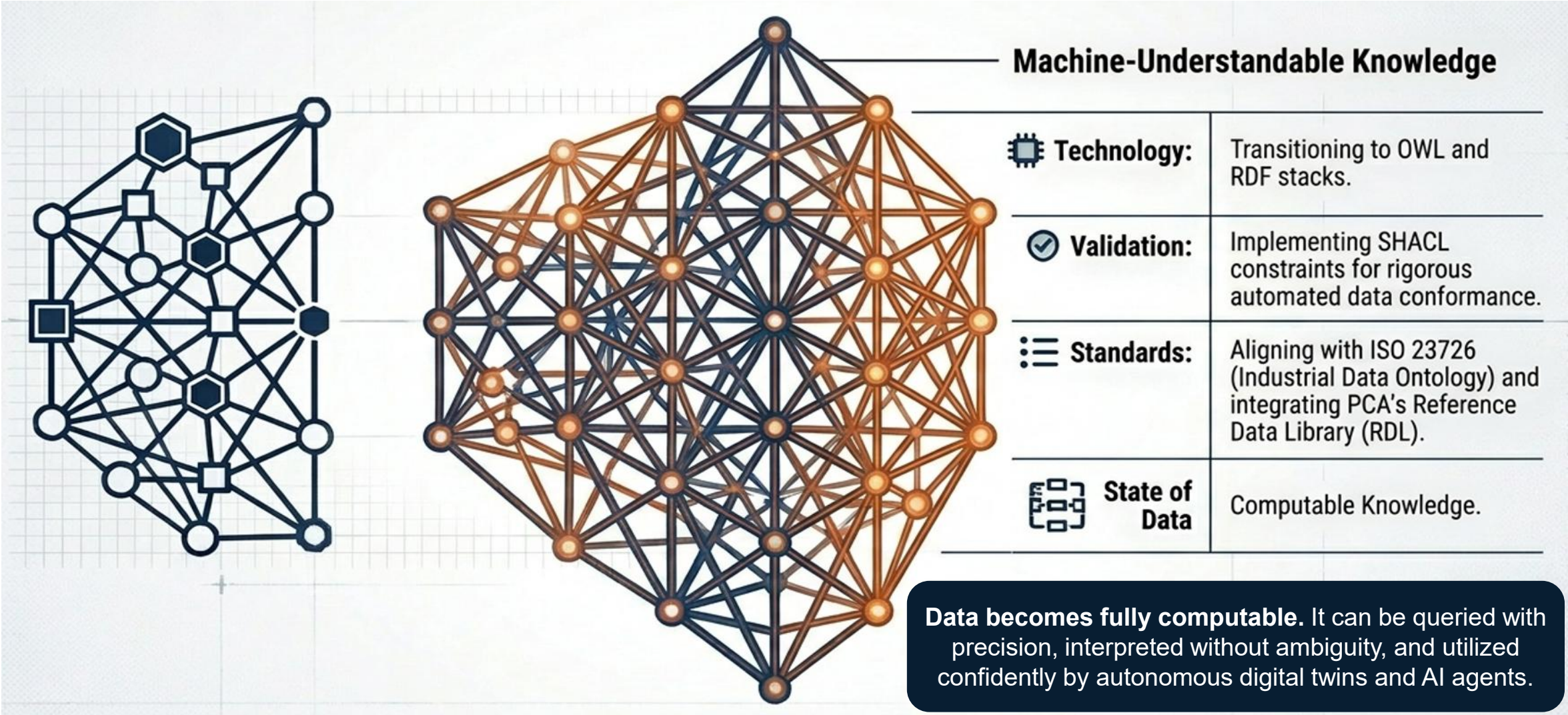
The three foundational pillars of AI-ready industrial data



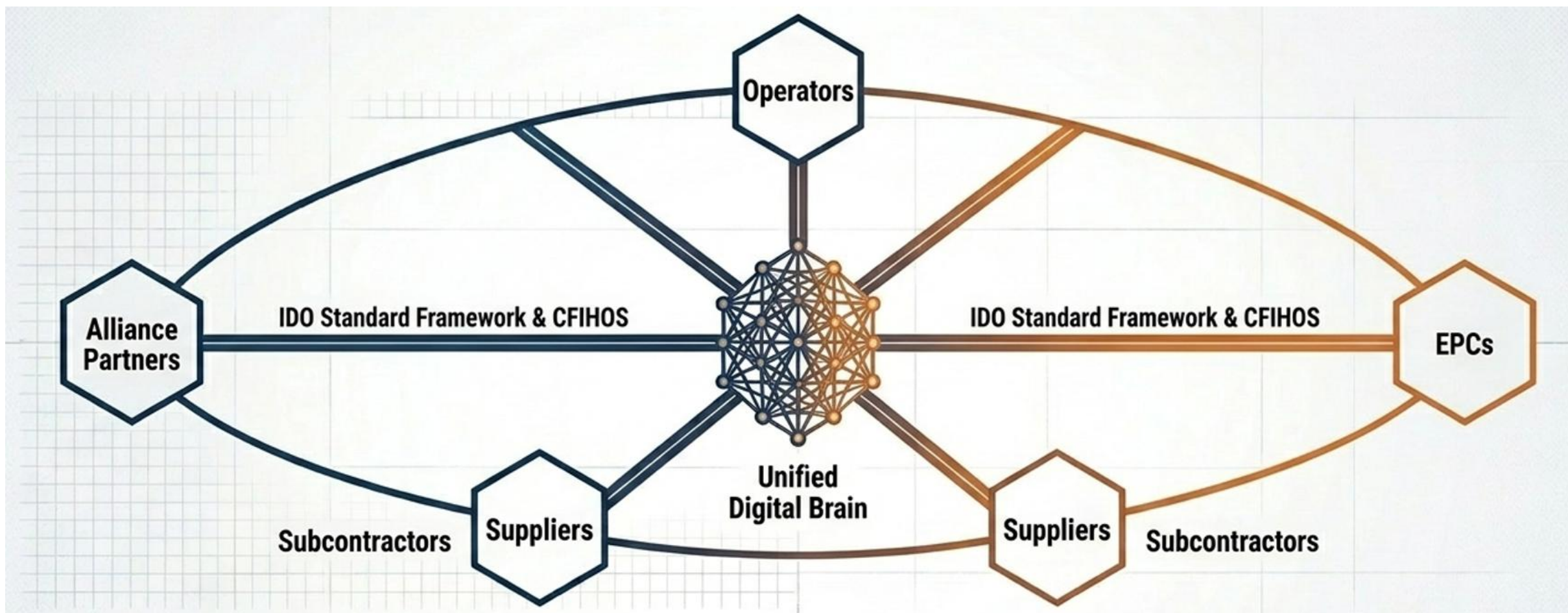
The Semantic Evolution Roadmap: Current State



The Semantic Evolution Roadmap: Future ambition



Scaling from project collaboration to industry-wide interoperability



Aligning with the **Industrial Data Ontology (IDO)** moves us from solving interoperability locally to enabling it at an **industry-wide** scale. Standardization is the only mechanism that allows data to cross organizational boundaries without losing its meaning.

Our blueprint: How to lay semantic tracks today



Start Practical

Don't wait for a perfect ontological vision. Solve real pain points today, like handover inefficiencies and data cleansing, using pragmatic tools like GraphQL to build trust and traction.



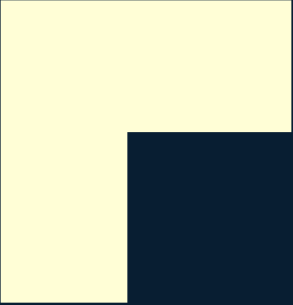
Use Industry Standards

Don't invent your own language. Adopt global standards like CFIHOS, ISO 15926 so your asset data is born speaking a universally understood language



Build for the Future

Treat data as a 30-year asset. Every structural decision you make today is laying the semantic tracks that future digital twins and autonomous AI agents will depend on.



*“Digital transformation is not about the tools
you buy - it’s about the meaning you build.*

*Because when the meaning is
right...interoperability, AI, and scalability
simply follow.”*





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