

From Matter to Intelligence

The AI Transformation of the Chemical Industry

How BASF, Accenture, and SAP are
building the cognitive enterprise.

Strategic Brief: Deep Tech • Clean Core
Strategy • Geopolitical Competitiveness



Executive Summary: The Path to the Cognitive Enterprise



The Shift (Why)

The industry is pivoting from "Mastery of Matter" to "Mastery of Complexity." AI is a geopolitical necessity for controlling energy, medicine, and materials.



The Engine (How)

A dual-engine strategy:

- **The Core:** SAP S/4HANA and 'Clean Core' strategy as the digital nervous system.
- **The Architect:** Accenture enabling process strategy and change management.



The Impact (What)

- **R&D:** Compressing 5-7 years of lab work into **6-12** months.
- **Production:** Yield increases of **+3-8%** and energy reduction of **-10-20%**.



The Horizon (When)

Moving from "Digital Twins" (Now-2028) to "**Autonomous Discovery**" (2033+), where software drives the industry.

The Industry Inflection Point: Managing Complexity is the New Competitive Advantage

The definition of value in the chemical industry is changing.

- **Historically:** Mastery of Matter through Knowledge.
- **Future:** Mastery of Complexity through Intelligence.

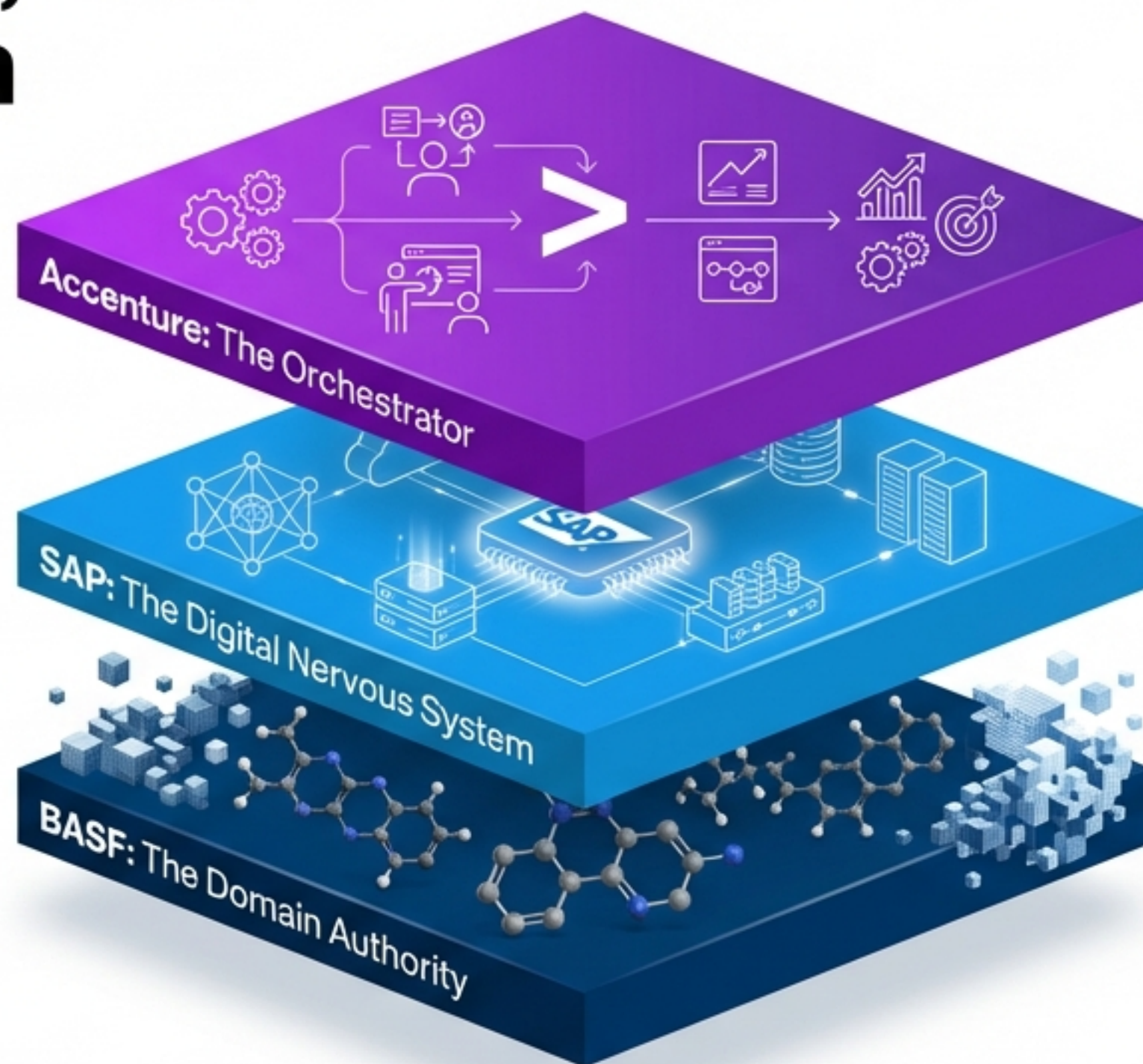
The Stakes: A civilization-level challenge. Winners control the fundamentals: Materials, Energy, Medicine, Infrastructure.

The Gap: Data silos and legacy paper systems prevent AI scaling. Without a data foundation, AI is just a gimmick.

Key Insight: Winners will use AI to break dependency; losers will become dependent on external technology platforms.



The Strategic Ecosystem: Domain, Core, and Orchestration



Bridge between raw tech and business value.
Specifics: Process strategy, prompt design, data governance, Human-in-the-loop change management.

Technical foundation: S/4HANA Cloud Private Edition, Datasphere, Business AI.
Role: The strategic digital core, not just legacy ERP.

Deep chemical expertise, regulatory requirements, specific data models.
Goal: Moving from "Expertise in heads" to "Real-time data intelligence".

The Digital Nervous System: SAP S/4HANA & The 'Clean Core' Strategy

Standardization:

Reducing customer-specific modifications to ensure upgradeability.

Real-Time Agility:

Shifting from retrospective reporting to real-time analysis kernel.

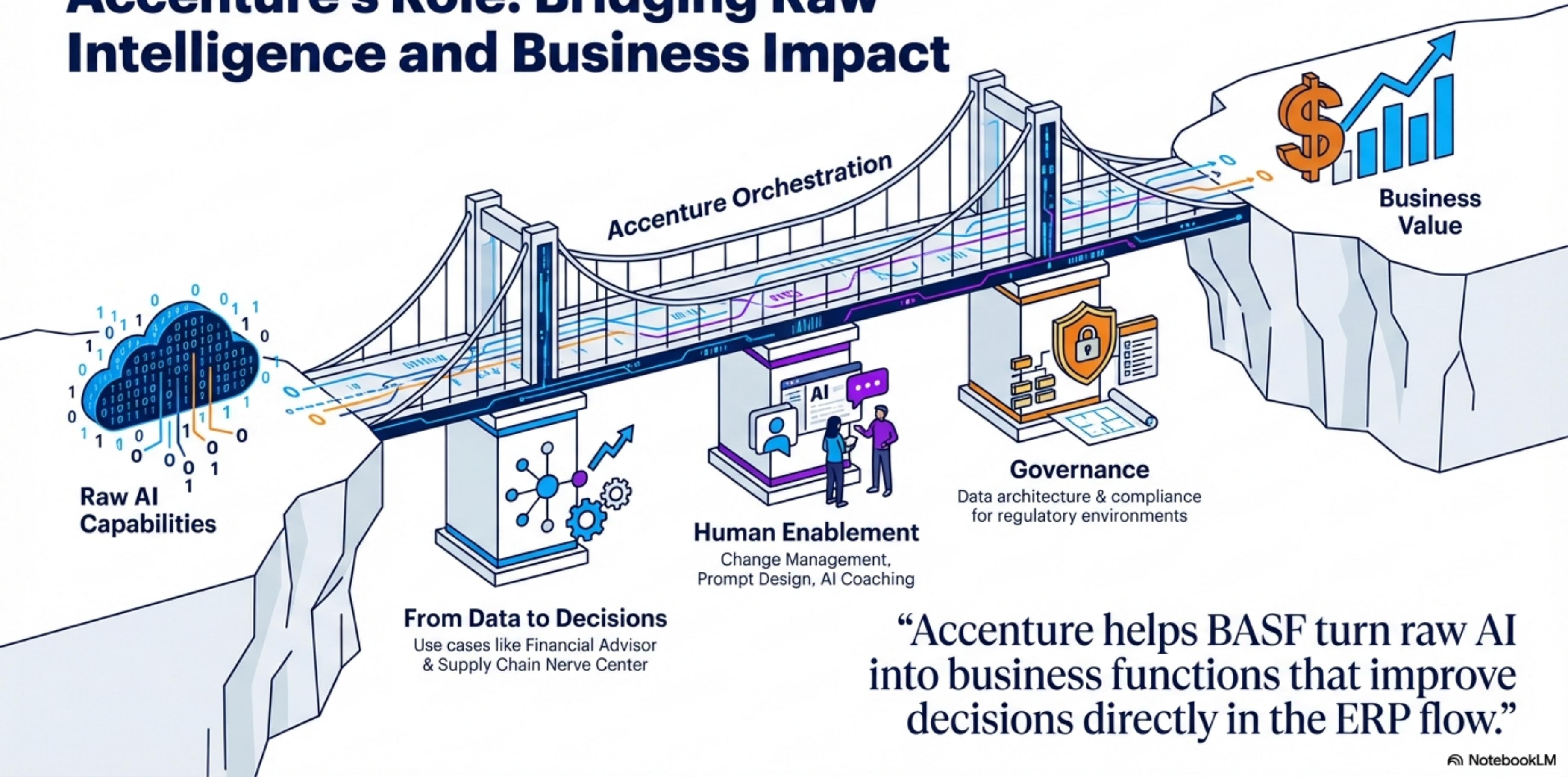


Business AI & Joule:

Integrating intelligence directly into process flow (Finance, Supply Chain).

The Payoff: A centralized data pivot point is the prerequisite for all advanced AI operations. No Clean Core = No Scalable AI.

Accenture's Role: Bridging Raw Intelligence and Business Impact



Scientific Corporate Precision

Arena 1: Research & Molecular Discovery (The Deep Tech Core)

Compressing innovation cycles from years to months.



Capabilities



- Generative design of molecules, screening thousands of variants in hours, property prediction before synthesis.

Applications



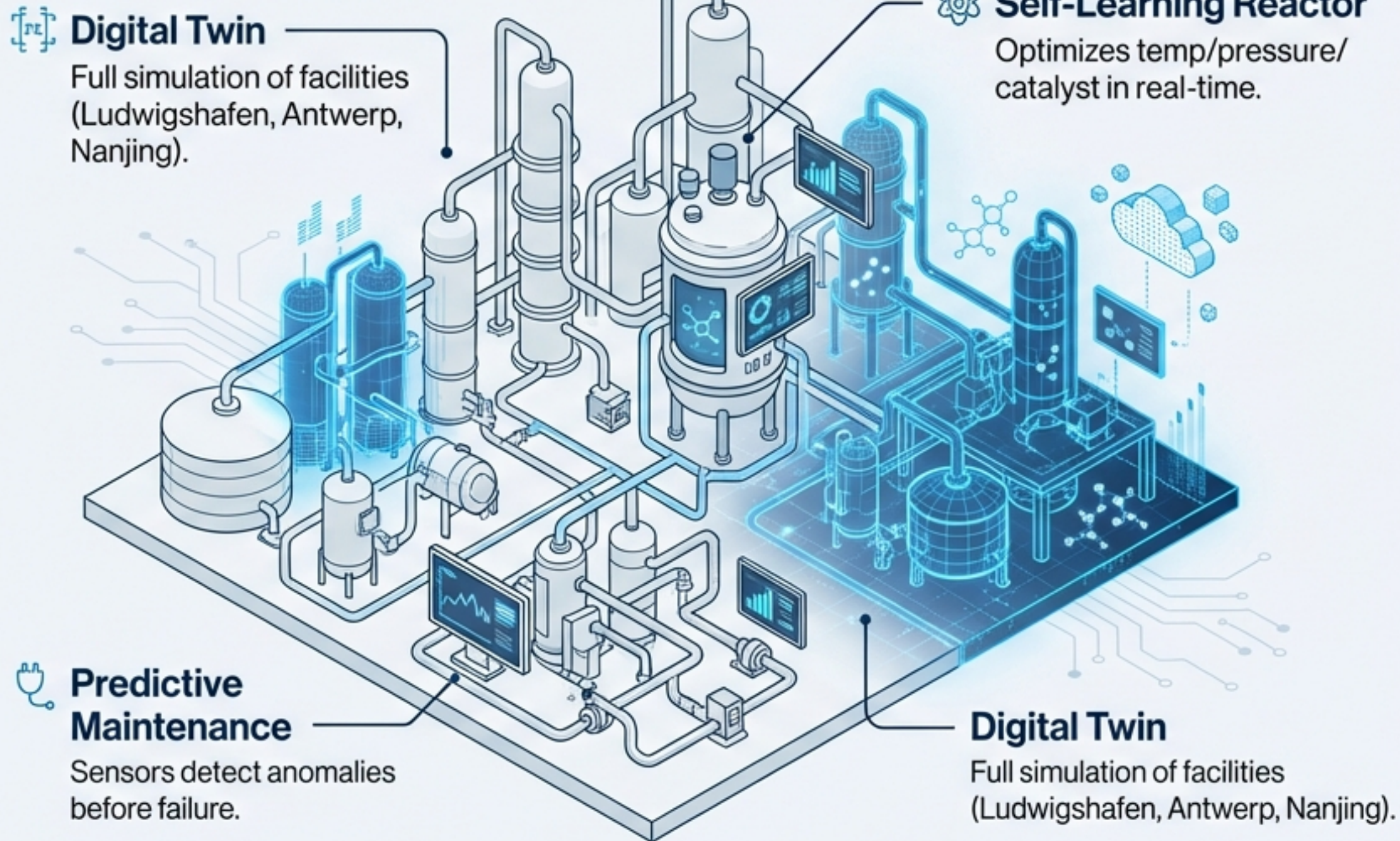
- New polymers, battery materials, catalysts, CO₂-lowering processes.

Partnerships



- Collaboration with Microsoft, IBM, Google, and startups (Citrine, Kebotix) integrated with SAP backbone.

Arena 2: Smart Manufacturing & The Self-Optimizing Plant



Yield: ↗

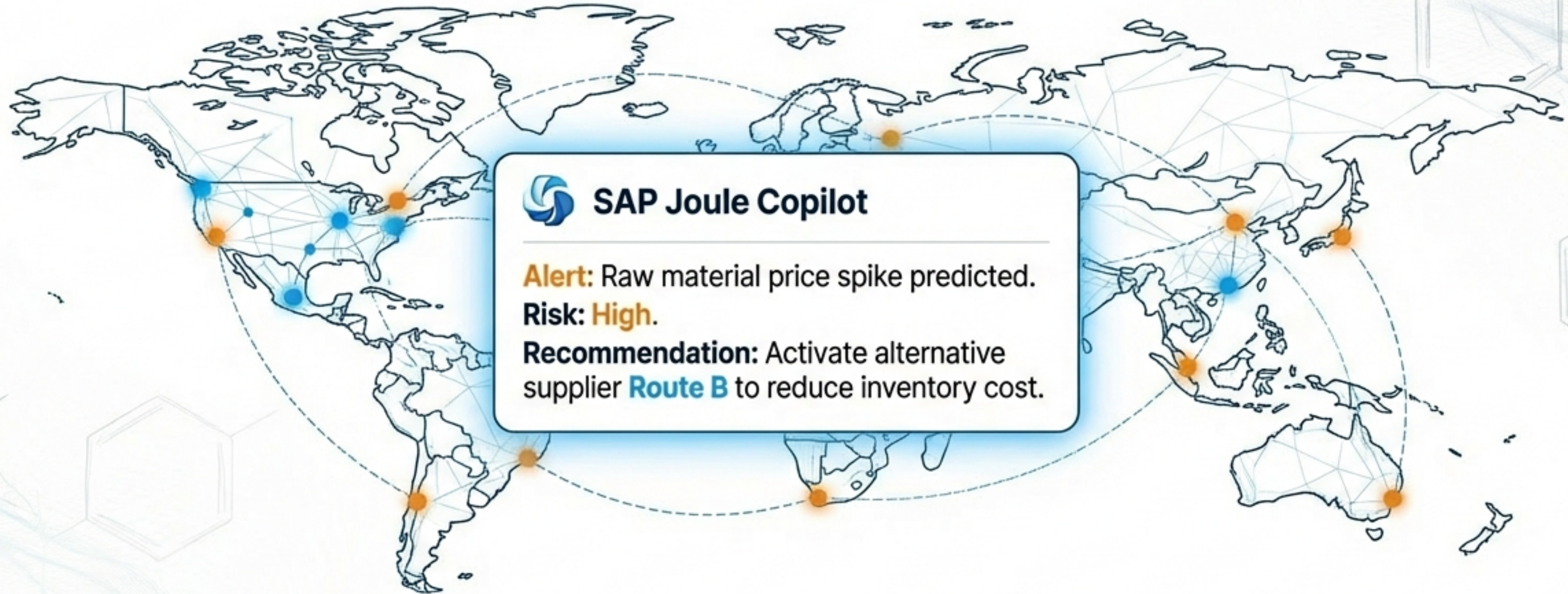
+3–8%

Energy Consumption: ↓

-10–20%

For BASF's scale, these shifts represent billion-euro value effects.

Arena 3: The Intelligent Enterprise & Resilient Supply Chains



Joule Copilot: AI assistance in HR, Finance, and Procurement.



Supply Chain Nerve Center: Dynamic forecasting for volatile markets (War, Energy Crisis).



The Shift: From Reporting to Recommending.

The Horizon: A Roadmap to Autonomous Discovery (2026–2035+)



Clean Core, Digital Twins in core plants, AI in labs. Result: 5–15% productivity gains.



Semi-autonomous factories, Green Chemistry focus, reduction in failed experiments.



“Autonomous Discovery.” AI develops, tests, and optimizes independently. Chemistry becomes a software-driven industry.



Critical Success Factors: Why Transformations Fail

It's not about the model; it's about the foundation.



Data Quality

Silos and legacy paper kill AI.
"Garbage in, Garbage out".



Talent Integration

Chemists and Data Scientists
must work in one team. No silos.

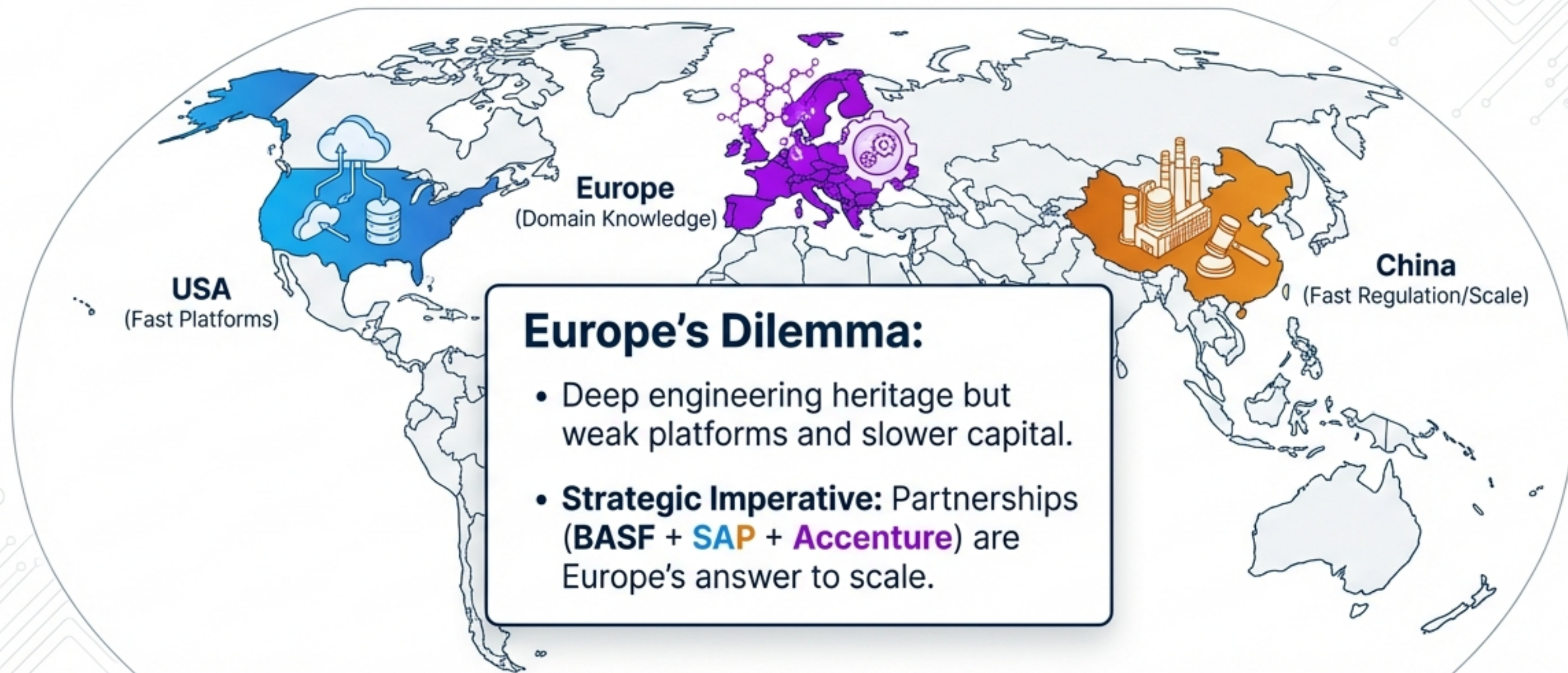


Patience & The J-Curve

Data cleanup takes 2-3 years.
ROI is not visible in 6 months.

Cultural Shift: Moving from 'Gut Feeling' to 'Evidence'.

The Geopolitical Reality: Europe vs. The World



The Civilizational Question: Control over the chemical industry is control over the building blocks of the future economy.

Conclusion: The Formula for Resilient Corporate Steering


$$\text{Data} \times \text{Domain Knowledge} \times \text{Patience} \times \text{Culture} \times \text{Integration} = \text{Success}$$

If any factor is zero, the result is zero.



SAP

Delivers the digital core and AI functions.



Accenture

Orchestrates integration and value delivery.



BASF

Connects operative data with real-time insights.

This is not merely digitalization. It is the foundation for a resilient, intelligent enterprise.

Appendix & Implementation Details

- Technical Specifications: SAP S/4HANA Private Edition Architecture
- Extended Use Case Data: Smart Manufacturing Yield Analysis
- Contact Information & Presenter Details

