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Brochure

Purpose-Built for Industry: How AspenTech Inmation's Data Fabric Enables the Intelligent Enterprise

AspenTech Inmation™
INDUSTRIAL DATA FABRIC

Introduction: The Industrial Data Dilemma

Industrial enterprises today are navigating a paradox: they generate more data than ever before, yet struggle to extract meaningful value from it. From legacy control systems and proprietary protocols to cloud-native analytics and AI, the data landscape is fragmented and complex. Add in the pressures of digital transformation, sustainability mandates, and integration efforts related to mergers and acquisitions, and the need for a unified data strategy becomes urgent.

AspenTech Inmation is purpose-built to solve this challenge. As an Industrial Data Fabric, it provides a secure, scalable, and intelligent infrastructure that connects operational data from the shop floor to the executive boardroom. It doesn't just move data; it transforms it into a strategic asset. Read on to learn how AspenTech Inmation is uniquely designed to meet the needs of industrial enterprises, outperforming generic data management tools and systems and delivering measurable impact where it matters most.

What Is an Industrial Data Fabric?

An Industrial Data Fabric is a modern data architecture that enables seamless data integration, contextualization, and accessibility across heterogeneous systems. Unlike traditional data lakes or point-to-point integrations, a Data Fabric is dynamic, metadata-driven, and designed for real-time operations.

AspenTech Inmation delivers this through:

- Universal data acquisition from OT and IT systems using native connectors for OPC UA, MQTT, Modbus, OSIsoft PI, Honeywell PHD, and more
- Centralized data consolidation in a high-performance, NoSQL repository optimized for time-series and event data
- Real-time and historical data access via open APIs (REST, JSON, OPC UA) and secure tunneling protocols
- Semantic modeling that maps raw data into business-relevant structures and hierarchies
- Lua scripting engine that provides the flexibility to handle new and evolving use cases

This architecture ensures that data is collected, understood, and trusted across the enterprise.

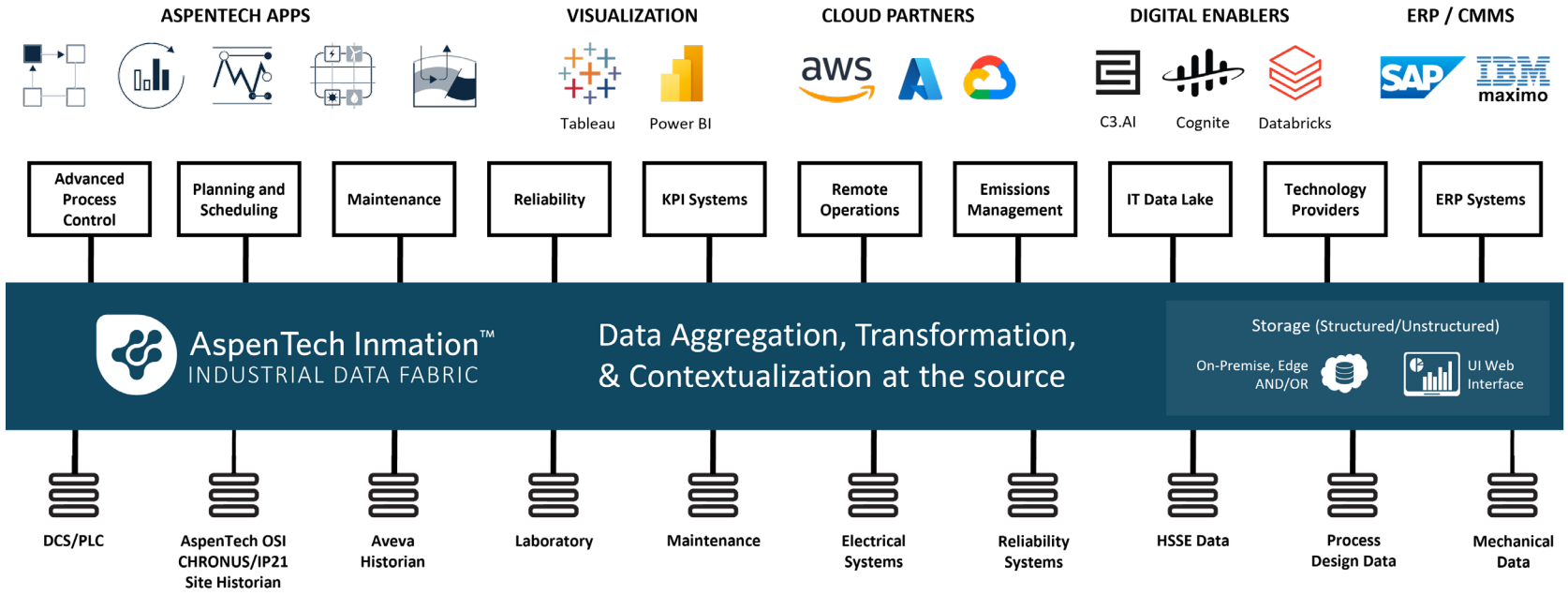

Figure 1: Changing the data paradigm using AspenTech Inmation from hard-to-get data to a unifying data fabric.

Built for Industrial Scale and Complexity

Industrial environments are inherently complex. They span multiple sites, vendors, and generations of technology.

AspenTech Inmation is engineered to thrive in this environment with:

- Microservice-based architecture for modular deployment and horizontal scalability
- Distributed node topology that supports edge, regional, and central data aggregation
- High-frequency data ingestion capable of handling sub-second updates from millions of tags
- Data buffering and store-and-forward mechanisms to ensure resilience during network outages
- Support for hybrid and multi-cloud deployments, including Azure, AWS, and private cloud environments

Whether you're managing a single refinery or a global network of manufacturing plants, AspenTech Inmation scales with your operations.

Figure 2: AspenTech Inmation WebStudio is designed to be a secure and singular interface to access your entire data source network.

Contextualization from Raw Signals to Smart Decisions

Raw data is only the beginning. To drive operational excellence, data must be contextualized by being linked to assets, processes, and business objectives.

AspenTech Inmation's Equipment Model provides a semantic layer that:

- Mirrors the physical and logical structure of your operations (e.g., plants, units, assets, sensors)
- Associates metadata such as units, limits, calibration status, and asset health
- Enables event-driven analytics, such as batch tracking, alarm correlation, and downtime analysis
- Supports data lineage and traceability, critical for regulated industries like pharma and food & beverage

This contextualization is accessible through DataStudio, AspenTech Inmation's client interface, and via APIs for integration with BI tools, MES, and AI platforms.

Powering Digital Transformation at Scale

Digital transformation is a business imperative. But without a unified data foundation, initiatives like predictive maintenance, digital twins, and autonomous operations stall.

AspenTech Inmation accelerates transformation by:

- Feeding AI/ML models with clean, contextualized, high-resolution data
- Enabling digital twins with real-time synchronization between physical assets and virtual models
- Supporting edge analytics for latency-sensitive use cases like vibration monitoring or emissions control
- Integrating with enterprise systems such as SAP, OSIsoft PI AF, and cloud analytics platforms

By bridging the IT/OT divide, AspenTech Inmation empowers cross-functional teams to collaborate, innovate, and act with confidence.

Security, Compliance, and Governance by Design

In an era of increasing cyber threats and regulatory scrutiny, data security is non-negotiable.

AspenTech Inmation is designed with a defense-in-depth approach:

- Single-port secure tunneling for all data traffic, minimizing attack surfaces
- Role-based access control (RBAC) and LDAP/Active Directory integration
- Audit logging and change tracking for compliance with FDA 21 CFR Part 11, ISO 27001, and NIST standards
- Data encryption at rest and in transit, using TLS and AES protocols
- On-premise data control, with optional cloud publishing for hybrid architectures

This ensures that your data is not only accessible—but also protected, governed, and compliant.

Real-World Impact Across Industries

AspenTech Inmation is trusted by global leaders across oil & gas, chemicals, pharmaceuticals, and more. Here are some ways that it delivers value:

Oil & Gas

- Unifies data from upstream, midstream, and downstream assets
- Enables predictive maintenance and emissions monitoring
- Accelerates post-merger integration of disparate control systems

Chemicals

- Centralizes data access across global production sites
- Improves batch traceability and quality control
- Supports digital twin initiatives for process optimization

Pharmaceuticals

- GxP-compliant data historization and audit trails
- Real-time visibility into manufacturing KPIs
- Reduced time-to-insight for quality and compliance teams

Metals & Mining

- Integrates data from mine sites, processing plants, and logistics systems
- Enables real-time monitoring of energy usage, ore throughput, and equipment health
- Provides a unified view of production and performance KPIs for both operators and executives

Manufacturing

- Connects legacy PLCs, SCADA systems, and MES platforms into a single data fabric
- Enables condition-based monitoring and predictive maintenance across production lines
- Improves OEE tracking and downtime analysis with contextualized, real-time data

And Beyond...

AspenTech Inmation's flexibility and protocol-agnostic architecture make it applicable across a wide range of industries, including:

- **Food & Beverage:** Ensuring traceability, quality control, and compliance with safety standards
- **Pulp & Paper:** Monitoring energy consumption, machine health, and production efficiency
- **Utilities & Power:** Aggregating data from distributed assets for grid optimization and emissions tracking
- **Water & Wastewater:** Enabling remote monitoring, leak detection, and regulatory reporting

These are just a few use cases of AspenTech Inmation across various industries, but users are developing new use cases every day. Wherever there's industrial data, AspenTech Inmation can bring clarity, control, and competitive advantage.

Purpose-Built for Industry—Not Just Another Data Platform

While many data management solutions claim to support industrial use cases, most are retrofitted IT tools that fall short in the face of real-world operational complexity. AspenTech Inmation is different. It was designed from the ground up to meet the specific, high-stakes demands of industrial enterprises—and that makes all the difference.

Native OT Integration, Not Just IT Compatibility

Most data fabrics are optimized for structured enterprise data—ERP systems, CRM platforms, and cloud databases. In contrast, AspenTech Inmation also speaks the native languages of the plant floor:

- Out-of-the-box support for industrial protocols like OPC UA, Modbus, MQTT, Siemens S7, Honeywell PHD, and OSIsoft PI
- Real-time ingestion of high-frequency time-series data from PLCs, DCS, SCADA, and historians
- No need for middleware or custom connectors, reducing integration time and risk

This deep OT integration ensures that data from critical assets is captured accurately, securely, and without disruption to operations.

Designed for Operational Continuity

Industrial environments can't afford downtime. AspenTech Inmation is engineered for always-on performance:

- Store-and-forward buffering ensures no data loss during network interruptions
- Redundant node architecture supports high availability and disaster recovery
- Edge-to-cloud flexibility allows data to be processed locally or centrally, depending on latency and bandwidth needs

These capabilities are essential for industries like oil & gas, chemicals, and pharmaceuticals, where uptime is non-negotiable.

Contextualization That Understands Industrial Workflows

Generic data platforms often treat all data as equal. AspenTech Inmation understands that a pressure reading from a compressor isn't just a number—it's part of a process, an asset, and a business decision:

- Hierarchical modeling mirrors physical plant structures and process flows
- Metadata enrichment adds meaning to raw signals (e.g., units, limits, calibration status)
- Event-driven logic enables batch tracking, alarm correlation, and root cause analysis
- This level of contextualization is what turns raw data into actionable intelligence for operators, engineers, and executives alike.

Security and Compliance Built for Industrial Risk

Unlike IT-centric platforms that bolt on security, AspenTech Inmation embeds it at the core:

- Single-port secure tunneling minimizes attack surfaces across firewalls
- Granular access control down to the tag or user level
- Audit trails and additional features support compliance with FDA 21 CFR Part 11, GxP, and ISO 27001

This is critical for regulated industries and for any enterprise managing critical infrastructure.

From Global Scalability to Centralized Operation

AspenTech Inmation is proven at scale—across hundreds of sites, thousands of assets, and billions of data points:

- Distributed architecture supports regional and global deployments with centralized governance.
- Microservice-based design allows for modular upgrades and minimal downtime.
- Unified system management through DataStudio simplifies configuration, monitoring, and license control.
- This means enterprises can grow without re-architecting their data infrastructure every time they expand.

Conclusion: The Future Is Fabric

Industrial enterprises are at a crossroads. The winners will be those who can harness their data, not just store it. AspenTech Inmation is the Industrial Data Fabric that makes this possible.

With its deep industrial connectivity, scalable architecture, real-time contextualization, and enterprise-grade security, AspenTech Inmation transforms data into a strategic advantage fueling innovation, resilience, and growth.

AspenTech Inmation is the data foundation for the future.

AspenTech Inmation Success Stories

TotalEnergies is deploying AspenTech Inmation across its industrial operations worldwide to aggregate and centralize millions of real-time data points into a single, secure platform. By unlocking unified access to operational data, TotalEnergies is accelerating the integration of AI into industrial processes, enhancing operational safety and performance, optimizing energy efficiency, and reducing CO_2 emissions.

AspenTech Inmation provides the technological backbone to support the smart manufacturing initiative for all of Boehringer Ingelheim's worldwide operations. AspenTech Inmation is guaranteed to enhance its product according to the challenging requirements of GxP in the regulated environment of pharmaceutical production.

AspenTech Inmation forms the "digital glue" required to integrate any equipment, automation system, MES and other operational data sources. It acts as a single, real-time data platform for the entire business unit. Bayer has seen a reduction of downtime, waste and other inefficiencies.

AspenTech Inmation supplies full data integration for SIG's next generation food packaging lines. Full standardization by using OPC UA across all equipment components, partially composed of third-party supplies. Creating a holistic packaging line address space in real-time, including full data historization for hundreds of thousands of items produced per day, different analytics and reporting.

AspenTech Inmation facilitates full integration of all of Philips' manufacturing equipment for shaver head production. The historian provides the highest performance and throughput capabilities to enable in-and-out of process analytics of high-volume discrete manufacturing data (involving sub-second and even sub-millisecond sensor data).

AspenTech Inmation securely streams real-time data from hundreds of connected interfaces into a centrally managed cluster. Endpoints provide pre-cleaned and contextualized data to various analytics and visualization tools empowering many value-added use cases, such as predictive maintenance, asset effectiveness, reliability center and augmented reality.

About AspenTech

Aspen Technology, now part of Emerson, is a global software leader helping industries at the forefront of the world's dual challenge meet the increasing demand for resources from a rapidly growing population in a profitable and sustainable manner. AspenTech solutions address complex environments where it is critical to optimize the asset design, operation and maintenance lifecycle. Through our unique combination of deep domain expertise and innovation, customers in asset-intensive industries can run their assets safer, greener, longer and faster to improve their operational excellence.

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