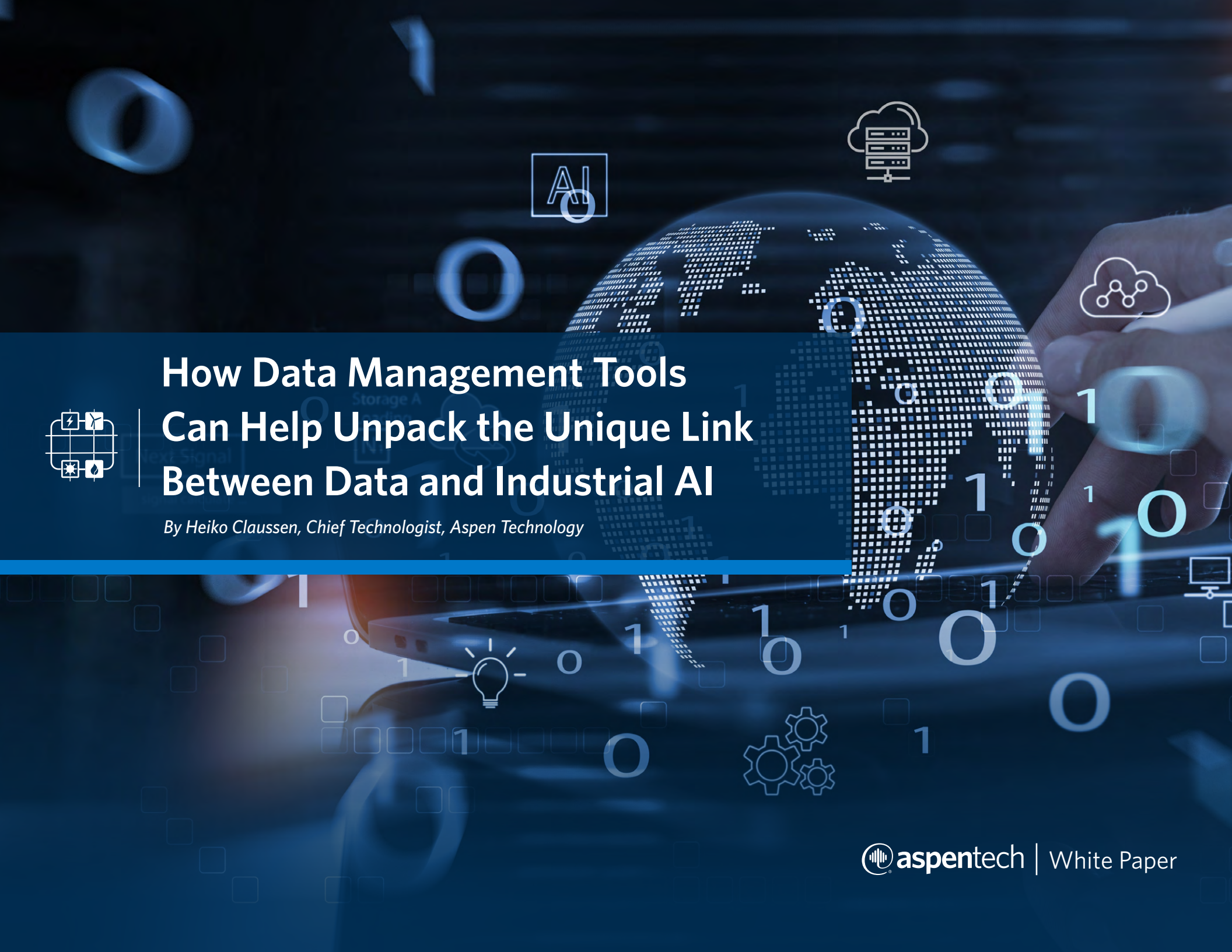

How Data Management Tools Can Help Unpack the Unique Link Between Data and Industrial AI

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Introduction

Data and AI are inextricably linked in most conversations. The narrative tends to be that organizations are not using AI effectively if they don't have quality data from the field feeding into AI models.

While this may be true in many industries and organizational contexts, it's far from universal. In fact, in many contexts, purpose-built industrial AI can be highly effective based solely on first principles and simulation models.

But while purpose-built industrial AI designed for industries like oil and gas or chemicals may not require data from the field, that's not to say data is unimportant. Ensuring engineers, plant personnel and IT/OT leaders have access to centrally managed, contextual data is critical to deriving data-driven insights across the business.

With the proliferation of modern digital tools and sensors, industries are collecting more data than ever before. As the volume of industrial data continues to grow, data management tools are fast becoming a key technology, helping companies sort through vast pools of data to better understand what information they have—all of which translates to higher levels of operational excellence.

Forward-looking industrial organizations understand the growing data landscape, how well-managed data can improve their businesses and even the nuanced relationship between data and industrial AI. An advanced data integration and management platform is becoming a critical tool, as it creates a unified data fabric across plant and enterprise systems by connecting directly to OT platforms and IT systems.

With connectivity between OT and enterprise systems, companies can achieve the true end-to-end visibility they need to get the most out of their industrial AI solutions.

Dealing With Today's Data Deluge

For decades, companies have collected data in one form or another, beginning with paper records collected by hand for sensors and integrated systems. What was once a trickle of information has become a deluge in recent years.

Estimates from the World Economic Forum suggest that industries generated as much as 130 zettabytes of data in 2023. Despite collecting huge amounts of data, surveys show relatively little data actually gets used. A Forrester Research study found that companies use just 12% of their data for analysis and less than 30% of companies say they can translate the data into action.

One reason why data is not used as well as it could be is because it is often highly siloed. In industrial environments, data is collected and stored across different plants and systems with different formats, tags and protocols, making it difficult to coordinate the use effectively.

Giving Data Context

Some organizations are mitigating siloes and simplifying the process of aggregating vast amounts of data through agnostic **centralized data management tools.** With fewer connectors and extractors across various systems,the ability to be hosted anywhere, ingest data from anything and feed data into anything, such tools are making data available to users when, where and how they need it.

But arguably the most important capability of advanced data management tools is adding crucial context to raw data. Context gives companies a holistic understanding of their data—where it comes from, what sensors and units of measure it represents, when it was collected and more. Today's industrial use cases require not just a stream of binary values, but also metadata, such as specifications, plans, schedules and work orders. All this data needs to be stored in the right context for it to be useful.

Data contextualization can be automated with an industrial data management tool such as **AspenTech Inmation™**. Because this technology inherently knows the location of data and its associated context, industrial organizations can eliminate the challenging, manual task of moving data and applying context afterward.

By eliminating this step, companies can accelerate efficiency gains and fuel digital transformation initiatives that help them overcome increasingly complex technological and environmental challenges.

Data and Industrial AI: A Powerful Combination

AI is a digital transformation initiative that has quickly risen to the top of corporate priority lists across industries. Purpose-built industrial AI solutions can be applied to a wide range of operational challenges, from monitoring and analyzing emissions to automating mundane tasks to aiding engineers' decision-making.

Much of this can be achieved without field data, thanks to first principles, simulation models and deep industry domain expertise to keep AI results safely within real-world constraints. In fact, an asset shouldn't be deployed in the field without such an approach. Industrial organizations eager to begin reaping the benefits of AI often don't have the luxury to wait for field data to be collected over time before training a model and controlling the asset.

While industrial AI is effective as-is, asset data can help take AI results to the next level. By refining an AI model with in-context operating data from an industrial data management platform, organizations are closing the simulation-reality gap and projecting future outcomes based on past observations. For instance, AI applications for predictive maintenance can be improved by identifying asset abnormalities and building models based on both normal and abnormal operations.

The powerful combination of industrial AI and the right data from the field can effectively supercharge companies' operational excellence initiatives, making it easier to create and sustain meaningful AI models that give companies a significant competitive edge. Whether it's helping to optimize existing processes, identifying ways to increase efficiency or informing the design of new processes, there should be little doubt that data is—and will continue to be—a critical resource for industrial organizations.

Making the Transition

Given the benefits of data for AI and other business improvements, how can companies make the move to more effective industrial data management tools? Replacing a web of siloed, global data connections that were likely set up by different personnel years earlier can feel overwhelming. And at the same time, companies have to maintain business continuity and avoid disrupting established processes that require traceable product information, test results and more.

By initially configuring a new data management tool as a real-time backup or redundant control system alongside current connectivity architecture, then removing previous connectivity incrementally after a validation period, industrial organizations can safely implement centralized data management tools. Ultimately, this approach is faster, easier and more secure than setting up many peer-to-peer connections.

With the right data management tool and strategy in place, organizations can get the most value from their data and enhance AI applications. The industrial data fabric of AspenTech Inmation enables the critical link between industrial OT and enterprise IT environments, connecting operational data into one platform that uncovers actionable insights and drives digital transformation initiatives.

As companies continue evolving toward more connected, data-driven operations, the seamless connection of servers, systems, interfaces, endpoints and data sources becomes critical to scale AI programs across the enterprise. By unifying data across systems, contextualizing it in real time and making it accessible to everyone, AspenTech Inmation provides the infrastructure to support that evolution.

Industrial Data Management Tools in Action

BASF uses AspenTech Inmation to securely stream 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 that enable many value-added use cases, such as predictive maintenance, asset effectiveness, reliability centers and augmented reality.

Bayer uses AspenTech Inmation to integrate equipment, automation systems, MES and other operational data sources. With a single, real-time data platform connecting the entire business unit, Bayer has seen a reduction in downtime, waste and other inefficiencies.

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 integrating AI into industrial processes, enhancing operational safety and performance, optimizing energy efficiency and reducing CO_2 emissions.

About Aspen Technology

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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