



COGNITE

DataOps for Power Generation

Manage architecture complexity
& enable scale for digital applications



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About Cognite

Cognite is a global industrial SaaS company that supports the full-scale digital transformation of asset-heavy industries around the world. Our core Industrial DataOps platform, **Cognite Data Fusion**[®], enables data and domain users to collaborate to quickly and safely develop, operationalize, and scale industrial AI solutions and applications.

Cognite Data Fusion[®] codifies industrial domain knowledge into software that fits into your existing ecosystem and enables scale from proofs of concepts to truly data-driven operations to deliver both profitability and sustainability.

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↳ DataOps for power generation

Introduction

Digital transformation in the power industry is not a new concept. For decades, ideas, technology, and resources have poured into digital programs aimed at curtailing the impending pressures caused by decreasing demand, decarbonization, and decentralization of power generation sources. This has resulted in a proliferation of new industrial data that is distributed across organizations and sites, but only truly valuable with contextualization and the proper transformations.

The opportunity

In light of rapidly aging assets and an experienced operational workforce that is leaving the field, CDOs, Operations, IT, and Citizen Data Scientists are focusing their attention on high value applications that maximize operational potential and longevity while reducing costs. Through a targeted deployment of technology enabled operations, such as workflow optimization, condition-based maintenance, process digitization, and agile working, utilities can increase plant efficiency (heat rate) by up to 3 percent, reduce the average all-in cost of generation (excluding fuel) by 10 to 20 percent for coal and 5 to 15 percent for gas, all while improving safety¹.

Use case pipeline

1. Data operationalization

- System-specific condition monitoring
- Asset health & risk monitoring
- Automated KPI aggregation & reporting
- Drawing digitization of P&ID, diagrams

2. Workflow optimization

- Production & maintenance planning
- 3D risk modeling for O&M, HSE
- Anomaly detection & management
- Work order management/digital worker
- Knowledge capture & distribution

3. Smart automation

- Robotic inspection for critical infrastructure
- Inventory management
- Work order generation

Data extraction, pipelining, access, contextualization, delivery

Physical models, digital twins, machine learning, OCR, NLP

Advanced data science, logistical models

Tech stack

- Improving power forecasting and trading decisions
- Maximizing operational visibility across sites/regions
- Streamlining maintenance planning and wrench time

three progressive categories of value to the organization ▲.

¹ Unlocking the value of digital operations in electric-power generation, McKinsey & Company, October 2019.

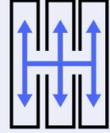
The individual applications that serve these larger objectives are widespread and can be tiered into

The challenges

However, with so much value potential and the eagerness to explore advanced analytics, AI, and machine learning, industrial data architectures have become increasingly complex, unable to serve data consumers in a dynamic, scalable, and repeatable way. This leads to stalled digital transformation efforts, cost overruns, and inefficient use of human resources, which manifest themselves in the following ways ▶.

These challenges are born out of data architectures that were fundamentally designed for point solutions and not with an open, holistic view that enables data utilization, prototyping, and rapid iteration for a growing portfolio of internal (Data Scientists, SMEs, Analysts) and external (System Integrators, Application Developers) stakeholders. The good news? Inflexible data architectures can be fixed with DataOps and Contextualization.

Challenges with traditional data architectures

	A	B
 <p>1 More data silos created due to vendor lock-in</p>	Inefficient data sources and licensing	Ineffective cross-compatibility of systems
 <p>2 Eroded trust in data quality & consistency</p>	Decreasing quality of analytics	Apps that are created but not used
 <p>3 Human costs outpacing efficiency gains</p>	Data scientists spend 80% of their time looking for data	More data managers required and provisioned
 <p>4 Long timelines for model development</p>	Models are stale by the time they reach deployment	Few actual deployments with significant maintenance overhead
 <p>5 Data usage barriers scaling with digital investments</p>	No good platform that integrates OT & IT systems at scale	Complexity is carried forwards via bespoke apps

↘ The solution

Liberate your data with DataOps and contextualization

The fastest path to returning value starts with getting the right data to the right user with the right context for the right problem at the right time. Said another way, with proper DataOps, your data becomes searchable and easily accessible for developers, data scientists, and third-party applications.

The secret to successful DataOps programs lies in investing in data contextualization. It is in this layer of the stack where meaningful relationships between data sources and types are established. This enables nonsubject-matter experts to be able to use that data for their projects. For example, turbine sensor tags and hierarchy may not make sense to analysts outside of the maintenance domain, but with proper context and mapping to P&IDs, the information becomes intuitive to nontechnical users for rapid application and model development at scale.

Cognite delivers DataOps & contextualization through Cognite Data Fusion®

Born from industry, Cognite offers Cognite Data Fusion® to support data consumers with highly accessible, relevant, and contextual-

What is DataOps?

A collaborative data management practice focused on improving the communication, integration and automation of data flows between data managers and consumers across an organization.

ized data from both OT and IT data sources across their organization. This empowers users to leverage AI & ML toolkits and low-code development frameworks to scale projects that are already in place or dramatically reduce the overhead and services required for new ones and quickly bring business value back to their organizations.

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Cognite Data Fusion® benefits

1. Expands the breadth of applications that can be developed internally or with partners
2. Empowers internal development teams with self-service APIs & SDKs

The goal of DataOps is to create predictable delivery and change management of data, data models and related artifacts.

DataOps uses technology to automate data delivery with the appropriate levels of security, quality and metadata to improve the use and value of data in a dynamic environment.

3. Accelerates app development and time to value with a robust data model
4. Expands app lifecycle and sustainability with rich data pipelining and aggregation
5. Democratizes embedded subjectmatter expertise with data access and contextualization

Cognite Data Fusion® stands apart from other data management vendors

- IT & OT Data Contextualization
- 3D & Unstructured Data
- Open Frameworks & Toolboxes
- Hybrid AI
- Digital End-to-End Solutions
- Performance and Scale

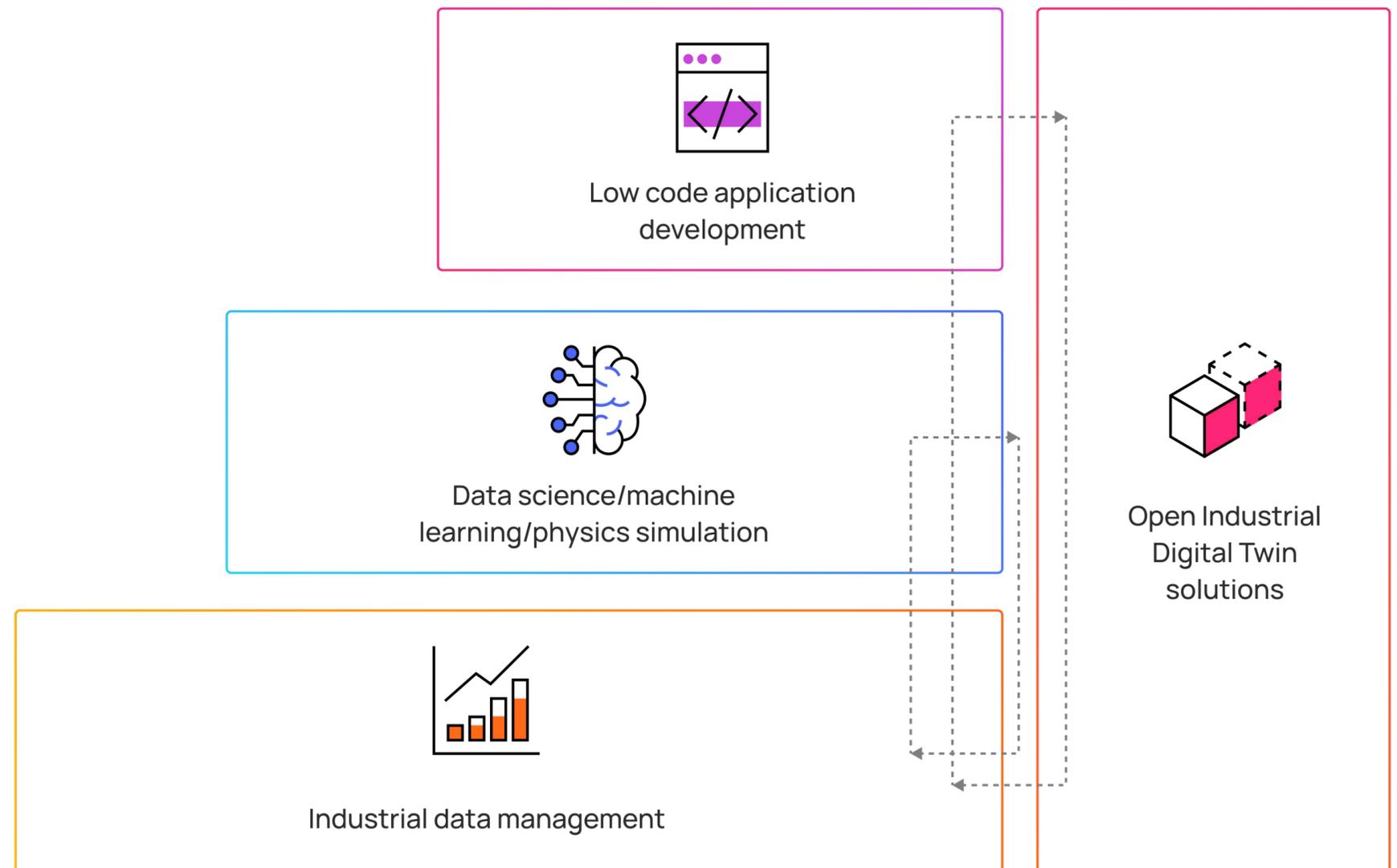
Cognite Data Fusion® is already delivering real value to industrial customers

Case 1: DataOps enabled Hafslund Eco to optimize turbine startup sequences, reducing downtime and enabling a more efficient response to fluctuating grid demand.

[READ MORE →](#)

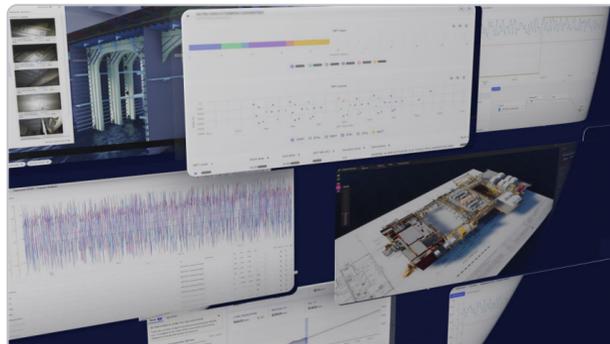
Case 2: Cognite Data Fusion® contextualized operational data from four different Aker BP source systems into a unified dashboard, saving 15 hours weekly on maintenance review of critical equipment.

[READ MORE →](#)



Want to know more about our product?

Explore more insights from Cognite



PRODUCT TOUR

Learn from Cognite customers and product managers how Cognite Data Fusion® simplifies and streamlines the data experience of a subject matter expert.

[WATCH NOW →](#)



CUSTOMER STORIES

Discover how Cognite Data Fusion® makes data more accessible and meaningful, driving insights that unlock opportunities in real-time, reduce costs, and improve the integrity and sustainability of your operations.

[GO TO STORIES →](#)



ANALYST REPORT

Customer interviews and financial analysis reveal an ROI of 400% and total benefits of \$21.56M over three years for the Cognite Data Fusion® platform.

[READ THE REPORT →](#)



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