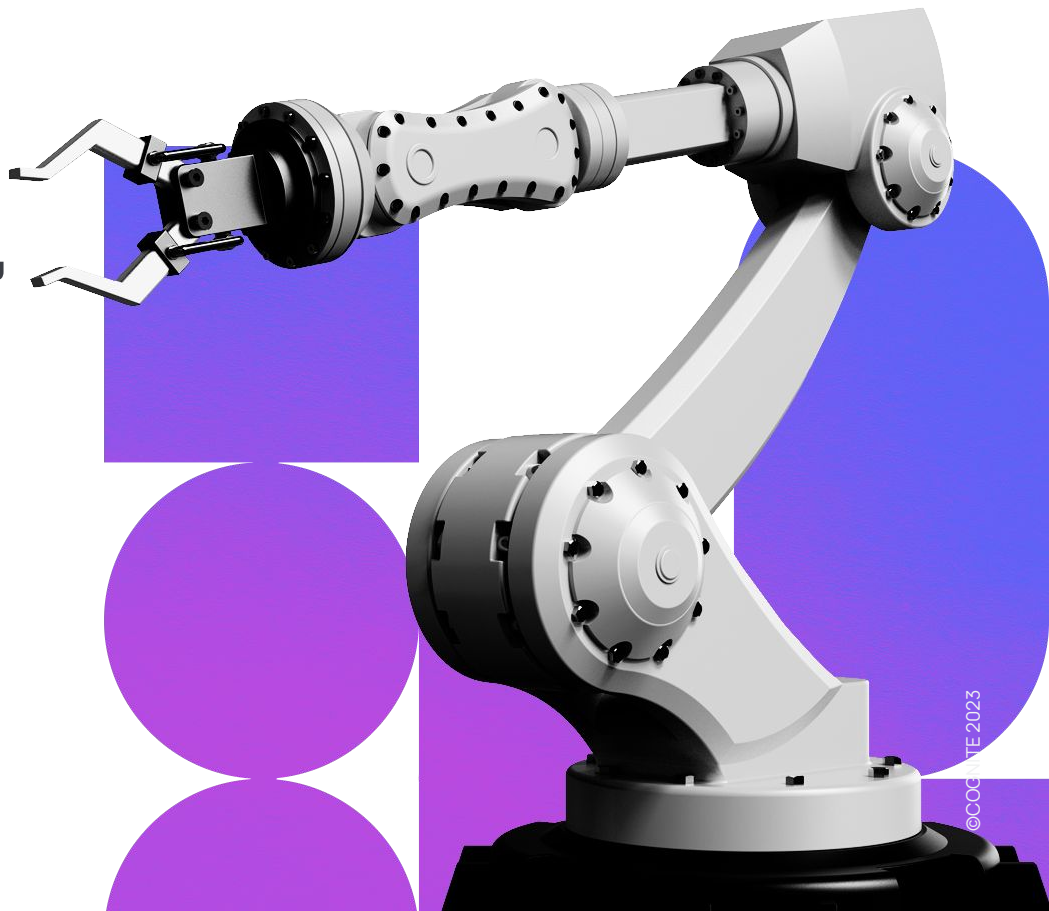




Playbook:

How to Deploy, Scale, and Trust Generative AI in the Chemicals Industry

An introduction to LLMs
+ Industrial Knowledge Graph

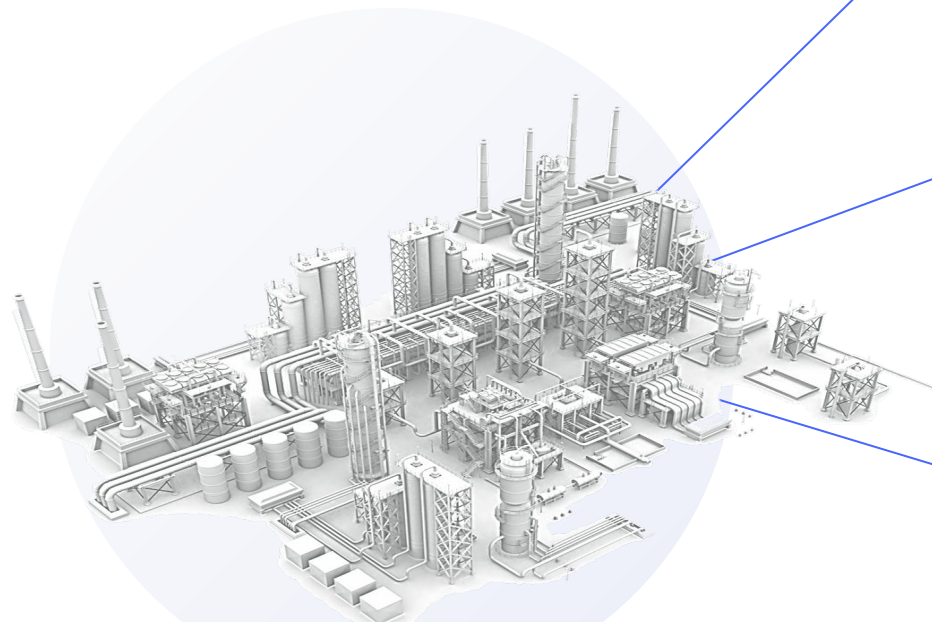


Section 1:

What is the generative AI opportunity across chemicals?

1. Value pools
2. Gen AI capabilities
3. Operations use case
4. Maintenance use case
5. Reliability use case

There is tremendous opportunity to improve operations with Gen AI



Optimizing production efficiency

10-30% throughput increase

- Reduce asset failures
- Faster root cause analysis
- Optimize planning and maintenance; reduce TAR planning times



Ensuring safe and sustainable operations

30-50% reduction in emissions

- Decrease water and energy consumption
- Remove people from hazardous environments
- Meeting GHG goals/emerging environmental regulations



AI-assisted business decisions

15-30% labor productivity increase

- AI-powered, no-code data exploration & analysis for subject matter experts
- Increase productivity in the field
- Develop and scale solutions at scale

The screenshot displays the 'Industrial Copilot' web application. The top navigation bar includes tabs for 'Manufacturing', 'Data Factory', 'Data Lake', and 'Settings'. The main interface is a chat window with a user asking to calculate excess power consumption for the Oda plant and a system response providing the calculation and a line graph. A blue book icon is overlaid on the right side of the screenshot.

[illegible]

The screenshot displays the 'Industrial Copilot' web application. The top navigation bar contains links for 'Manufacturing', 'Home', 'My extensions', 'Data Catalog', 'Robot', and 'Manage'. The main header area features the 'Industrial Copilot' logo and the tagline 'Experience the power of Google Data Studio and artificial intelligence.' Below this, a summary card titled 'Summarize the findings of the latest maintenance report for equipment 21-071-079. Did it resolve the issue we had during last week's production cycle?' is shown. The summary text states: 'Here is a summary of the maintenance report that Johan Hansen submitted on Monday, March 20th: The seal breakdown on March 17th was the result of a faulty seal, which ultimately caused a leak. The seal was replaced and the equipment now seems to be functioning as expected. Some minor, pending follow-up inspection next week. Below, you will find an image taken after the completion of the repair, as well as the relevant P&ID and time series.' The summary is accompanied by a photo of the equipment, a P&ID diagram, and a time series graph. A sidebar on the left shows a list of documents. A large purple icon of a document with a list is overlaid on the left side of the image.

The screenshot displays the 'Industrial Copilot' interface. At the top, a navigation bar includes 'Home', 'My collections', 'Data Catalog', 'Build', and 'Manage'. The main header reads 'Industrial Copilot' with the tagline 'Experience the power of Cognitive Data Fusion and artificial intelligence.' Below this, a message states: 'Show me all of the pumps made by Honeywell after 2015 in the compounding plant, serviced in January, that have had high upstream pressure (pumps lasting more than one minute in the last 4 months).' A section titled 'Here is a list of the 4 pumps that match your query:' provides a brief explanation of the search criteria. Below this is a table with 6 columns: Equipment ID, Manufacturer, Location, Date serviced, Upstream pressure, and Highest spike 1 hr mid. The table lists four Honeywell pumps from the compounding plant, all serviced in January 2023, with their respective upstream pressure trends and highest spikes.

Equipment ID	Manufacturer	Location	Date serviced	Upstream pressure	Highest spike 1 hr mid
Pump: 20-P1-0109	Honeywell	Compounding	January 15, 2023		4.1 bar 18:00-19:00 February 1, 2023
Pump: 20-P1-1021	Honeywell	Compounding	January 15, 2023		3.8 bar 09:00-10:00 February 1, 2023
Pump: 20-P1-0258	Honeywell	Compounding	January 20, 2023		3.9 bar 16:00-17:00 March 2, 2023
Pump: 20-P1-4030	Honeywell	Compounding	January 26, 2023		3.8 bar 06:00-07:00 March 2, 2023

At the bottom, there is a text input field with the placeholder 'Type a response, question, or query...' and a 'Send' button.

"My pump xx has failed. I need all the relevant data to troubleshoot the issue." Ask your Copilot to bring all the relevant data for troubleshooting, such as documents, pressure, temperature, etc.

"Summarize the findings of the latest maintenance report for the heat exchanger." Your Copilot will help summarize all your documents and bring the most important information upfront.

"I have this huge report on an RCA; which are the most important insights?" Ask your Copilot to summarize the insights and share them with colleagues.

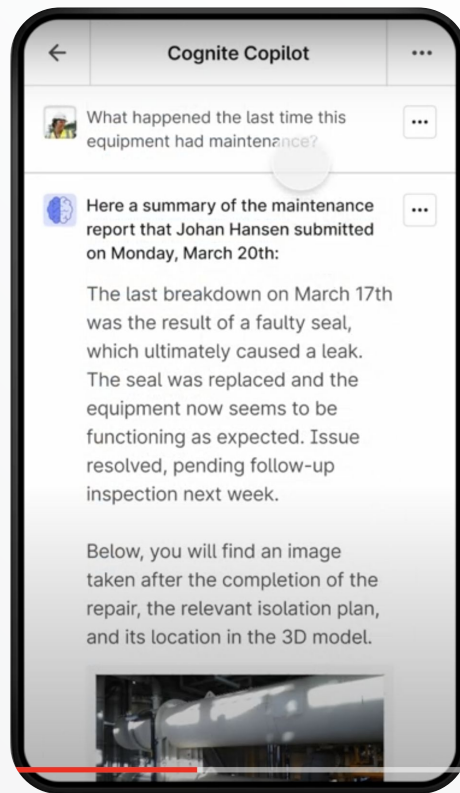
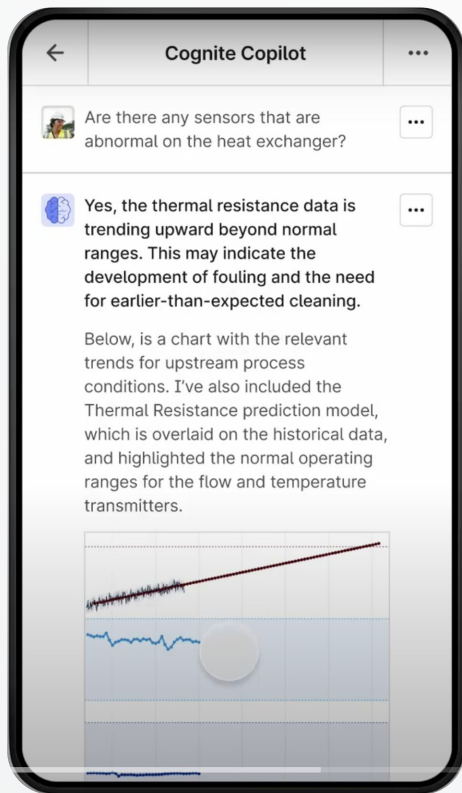
"I would like to create an application that shows me every work order whenever I search for a piece of equipment." Copilot can generate the code required to build Streamlit applications

Use case:

Create simple access to industrial data and cross-source insights

As an operator in the field, I don't have the time to double-check multiple sources (data and people) to gain context.

I need quick access to trustworthy data so I can understand real world conditions and take the appropriate actions to improve production ASAP.

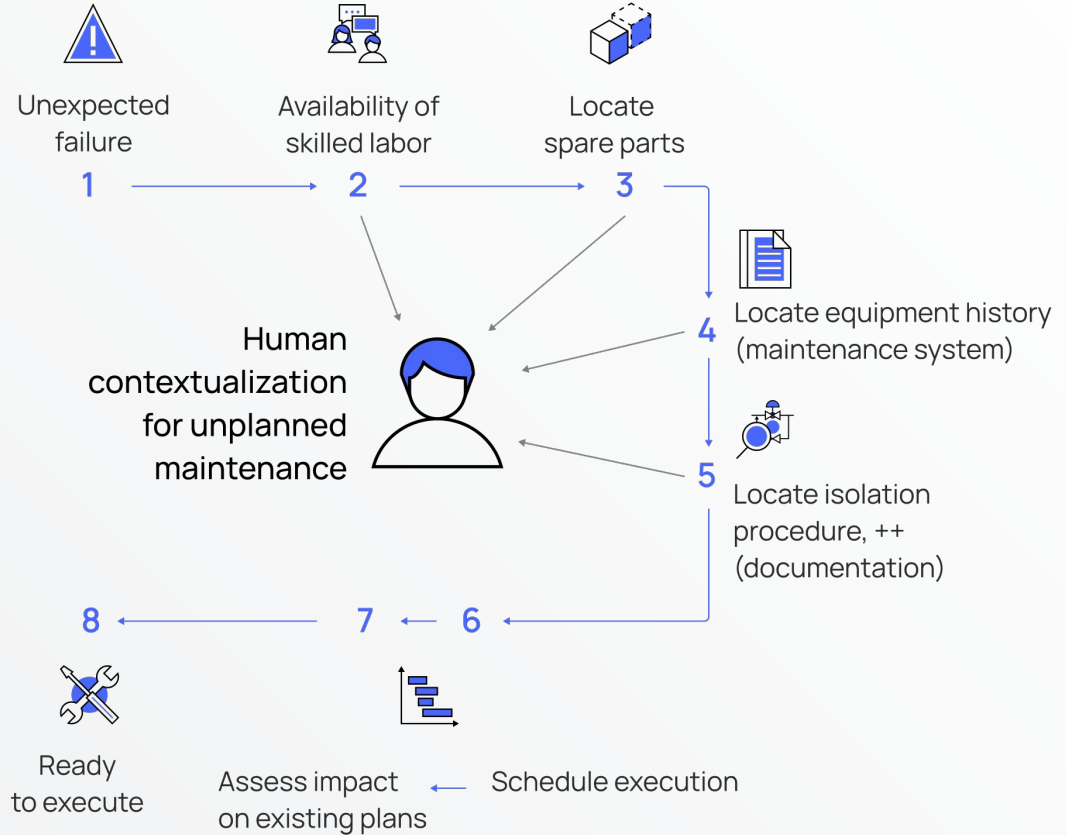


Use case:

Optimize planning, scheduling, and execution of activities

As a maintenance manager, I am always trying to proactively plan, but I have little insight into operations.

Priorities can shift rapidly, and it is a painful process to shift resources to execute new plans while minimizing impact to scheduled activities.



Use case:

Accelerate shift to data-driven condition-based activities

It's very hard to understand the condition across many different equipment as data and analysis are captured in disjointed systems and some assets have very little data.

Often times I need more complete information to take timely actions...



To troubleshoot the issue of the coffee being cold, you can start by checking the temperature sensor readings in the time series data. If the temperature readings are consistently low, it may indicate a problem with the heating element in the coffee machine. You can also use the infrared camera on the robot to check the temperature of the coffee machine directly. If the temperature is low, you may need to replace the heating element or adjust the settings on the coffee machine to ensure that it is heating the water to the correct temperature.

To troubleshoot the issue of the main water supply valve, you can use the computer vision model to check if the valve is open or closed. If the valve is closed, you may need to open it to ensure that the coffee machine is receiving water. You can also check the diagram that shows how the coffee machine is connected to the main water valve to ensure that the connections are secure and there are no leaks.



show the chart with the temperature values



Ok, showing the chart for 21PT1019 for the last week:

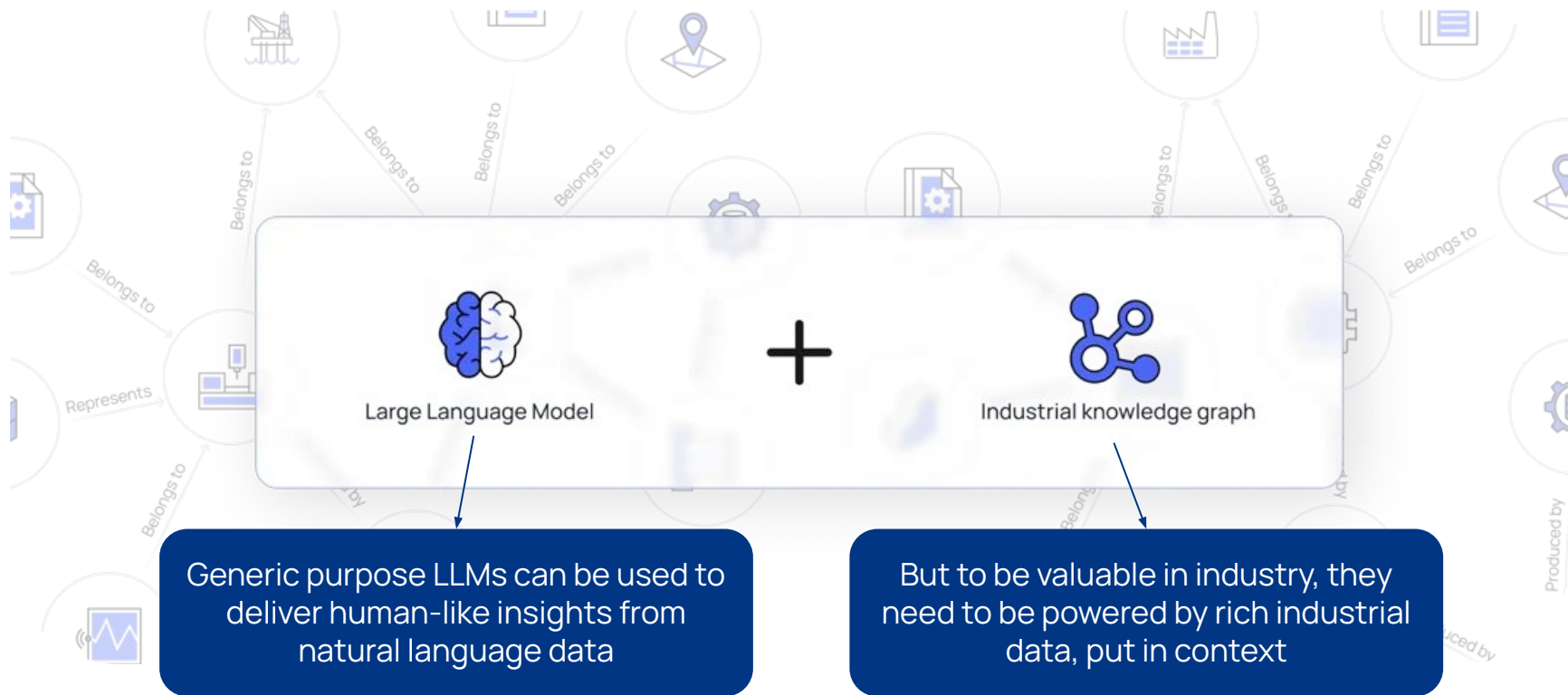


Section 2:

How do you deploy and scale generative AI use cases?

1. What's required?
2. How to trust Gen AI outputs
3. How do you deploy and scale?
4. Framework

What's required to deploy industrial generative AI?



This important combination of LLMs + an industrial knowledge graph offers *explainability* to **ensure user trust and prevent security risk**

Cognite AI addresses:

1. Data leakage

Keep industrial data proprietary and resident within the security of your corporate tenant

2. Trust & Access Control

Control what data is accessible through graph and API

3. Hallucinations

A deterministic industrial knowledge graph to minimize hallucinations



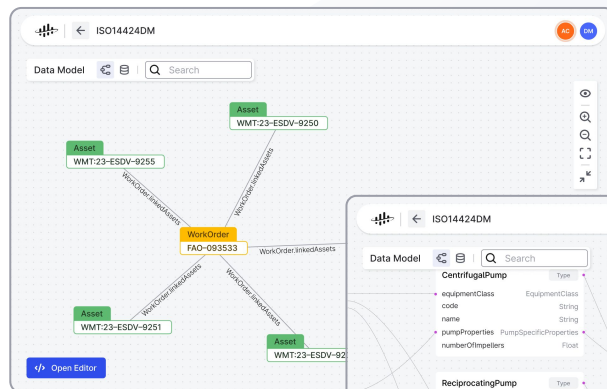
The industrial knowledge graph enables deployment of co-pilots and more, while serving as a foundation for scaling site-to-site

Automate data contextualization

- AI-powered contextualization services
- Mappings maintained automatically

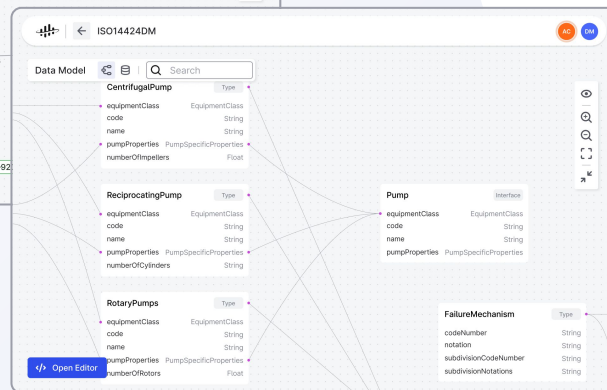
Contextualize all data types

- OT, IT, engineering, videos, images, etc.
- Pre-built extractors to industrial sources / protocols



Cognite Data Fusion's Industrial Knowledge Graph

Cognite Data Fusion's Flexible Data Modelling



Auto-populate data models

- AI suggestions to populate fields
- Copilot powered search

Use pre-built model templates

- Based on industry standards (ISA, CFIHOS, OSDU)
- Tailor templates to unique needs

With the right **data + AI framework**, you can rapidly scale proven capabilities & value

Scale what is proven

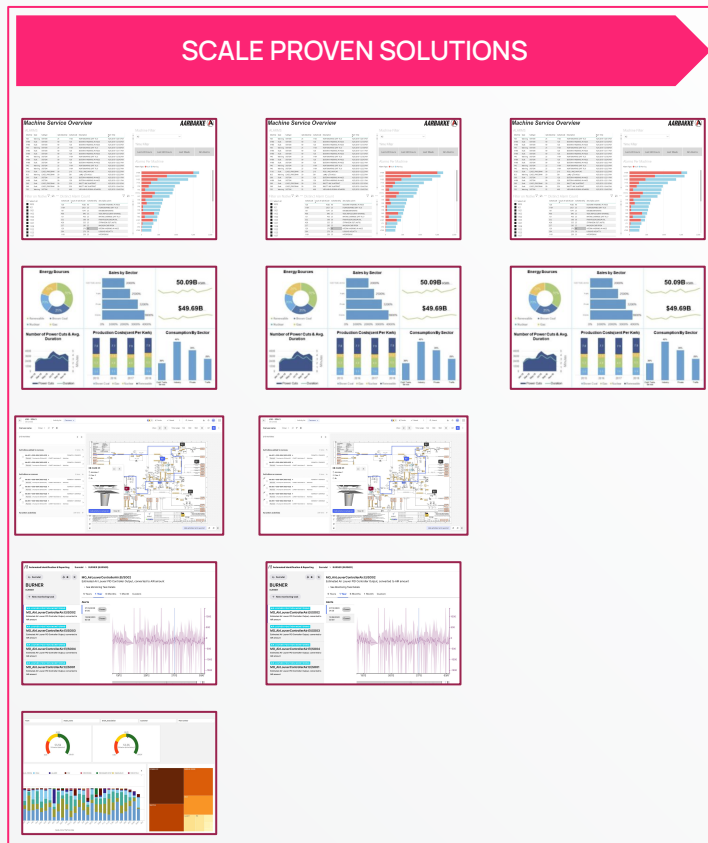
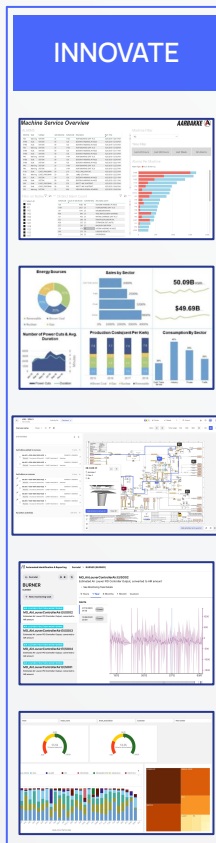
Rapidly scale proven solutions across production assets and fields

Scale in weeks, not months

With templated solution, and the ability to easily reuse previous data efforts, scale solutions in only days

Collaborate on innovation

Continuously improve and unlock value from 10s of use cases across assets by collaborating and sharing experiences



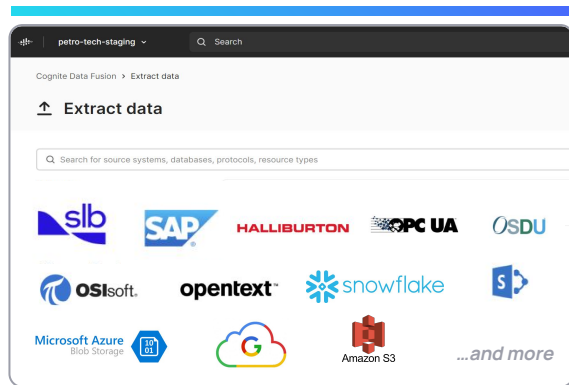
Section 3:

Where and how to get started

1. **Getting started**
2. **Cognite tech stack**
3. **Business value potential**
4. **Additional resources**

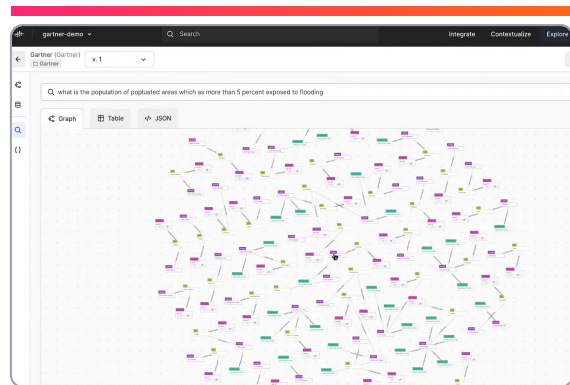
Getting Started: Prerequisites and order of operations

Liberate data



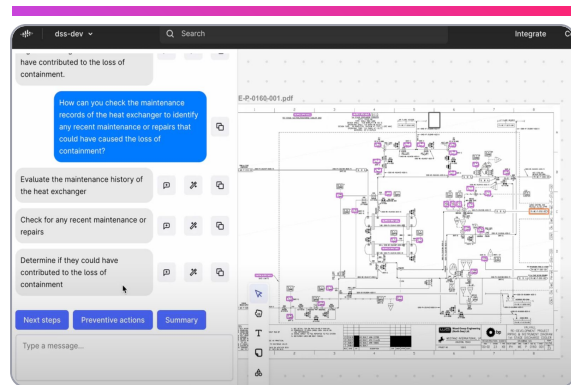
- All OT, IT and engineering data - **contextualized with AI**
- **Pre-built extractors** into common industrial sources and protocols
- Everything is accessible through a well-documented, open API

Build data foundation



- Interact with contextualized data through models, drawings, and **Google-like search**
- Automatically populate data models for faster and efficient scaling across
- Build knowledge graphs/ digital twins and leverage AI analytics to optimize plans

Create insights with AI

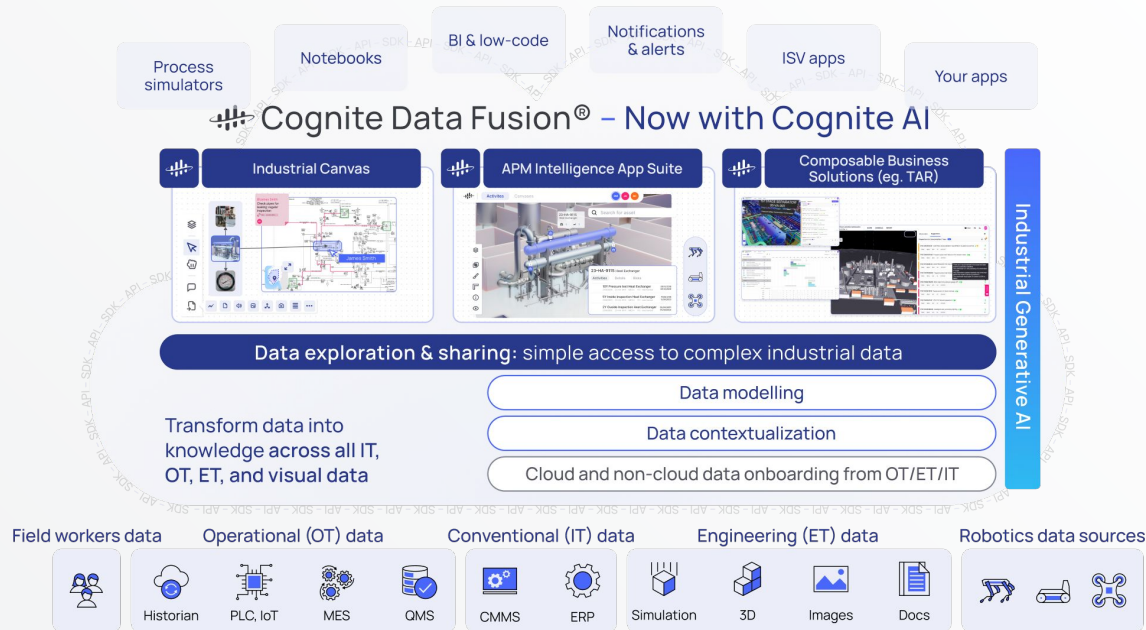


- Collaborative workspace for any data type (interactive P&IDs, 3D Models, and more)
- **AI-copilot** to find relevant data, no-code capabilities to create summaries, solutions, conduct root-cause analysis and make recommendations

Cognite offers comprehensive capabilities to accelerate your AI roadmap

→ Get in touch:
cognite.com/contact

→ Get a free AI value review:
cognite.com/en/value-review



Cognite Data Fusion offers industry-leading, automated data contextualization capabilities that ***make AI work for industry***

The business value of Cognite Data Fusion® with Cognite AI

Forrester Consulting: **400% ROI** from Cognite Data Fusion®

1-2%

Gain in SME
Efficiency

1-5 days

Reduced
Downtime

1%

Gain from Data
Productivity

2-3%

Reduced
Maintenance \$

2-3%

Increased
Machinery Optz

7-8%

Less Energy \$

Cognite AI

Increases efficiency of industrial workflows by **10x**
and **ease of use for end-users**

Industrial Canvas

Analyze complex scenarios 90% faster than before

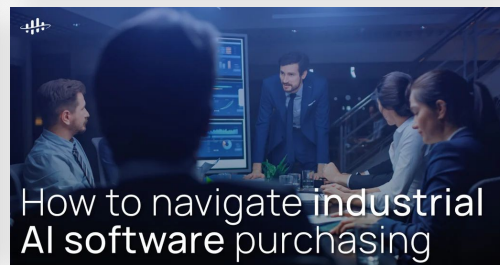
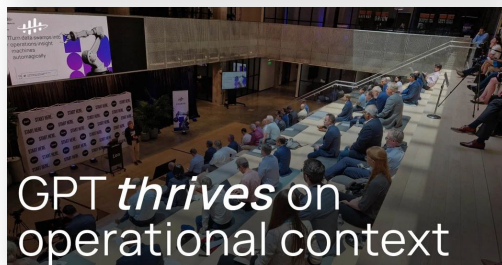
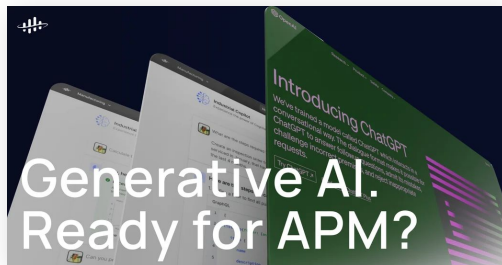
Data Modeling

Save thousands of domain expert hours

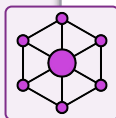
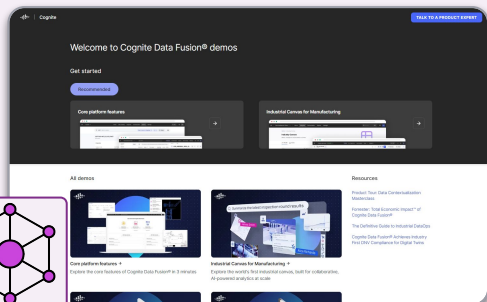
Industrial DataOps

Scale asset-to- asset, site-to-site in hours and weeks, not months and years.

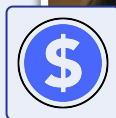
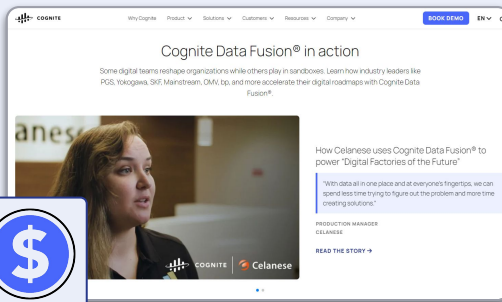
Learn more about Generative AI



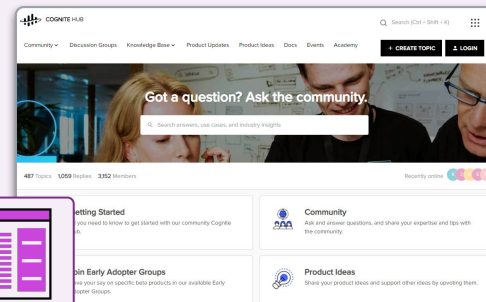
Learn more about Cognite



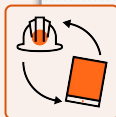
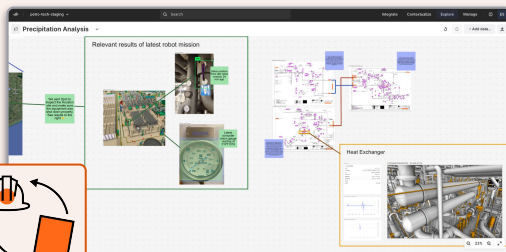
Cognite Demo Hub
Explore Cognite Data Fusion



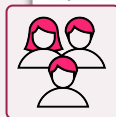
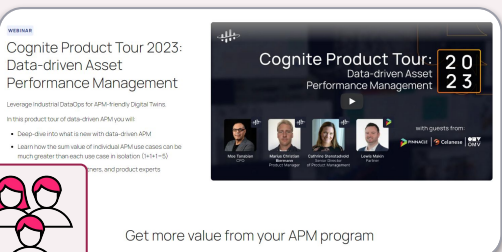
Customer Stories
Cognite success stories



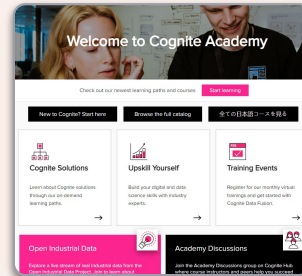
Cognite Hub
Cognite's user community



Industrial Canvas
Simple access to complex industrial data



Customer Solutions
Cognite's solution areas



Cognite Academy
Learn Cognite Data Fusion

Industrial Software for Global Industry

Simple Access to Complex Industrial Data

Cognite is the fastest growing industrial SaaS company in the world

Key Partners:



Global Partnership in the Energy Industry



Global Partnership for Manufacturing



Global Alliance & Center of Excellence



Global ISV, PRACR, Marketplace



Google Cloud Partner; Technology Partner of the Year: Manufacturing



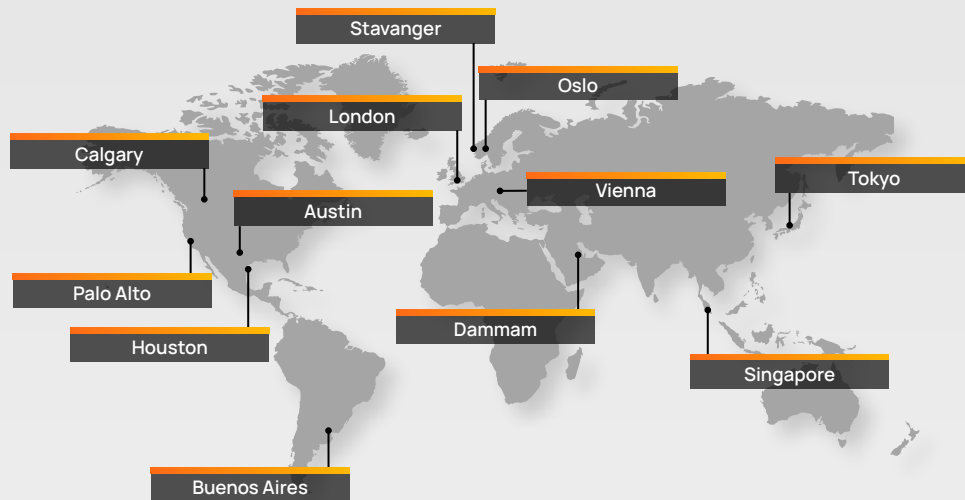
Long-term digitalization partner with 7.4% stake in Cognite



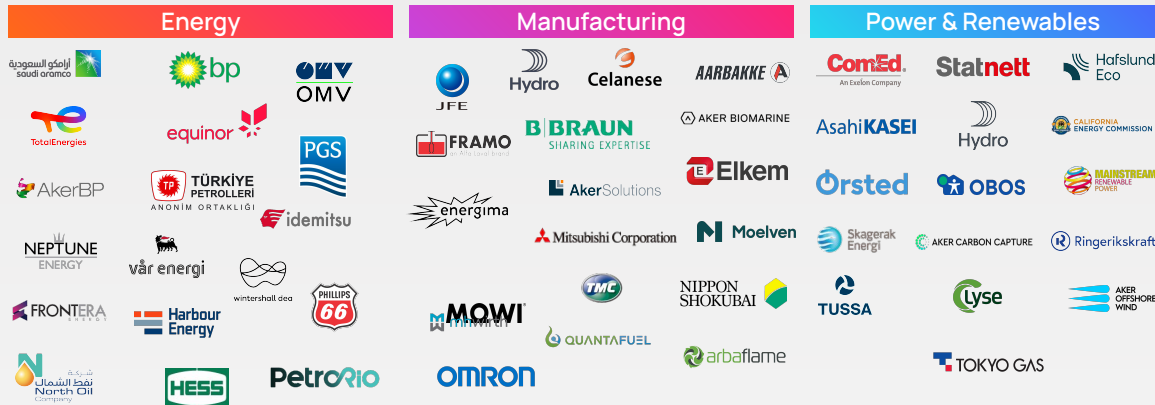
\$150M Series B (at \$1.6B) Redefining Modern industrial Data Management



\$75M Series A (at \$500M) To Accelerate Leadership in Industrial DataOps



Our Customers:





Thank You

contact@cognite.com
www.cognite.ai

