



Playbook:

# How to Deploy, Scale, and Trust Generative AI for Production Optimization

An introduction to LLMs  
+ Industrial Knowledge Graph

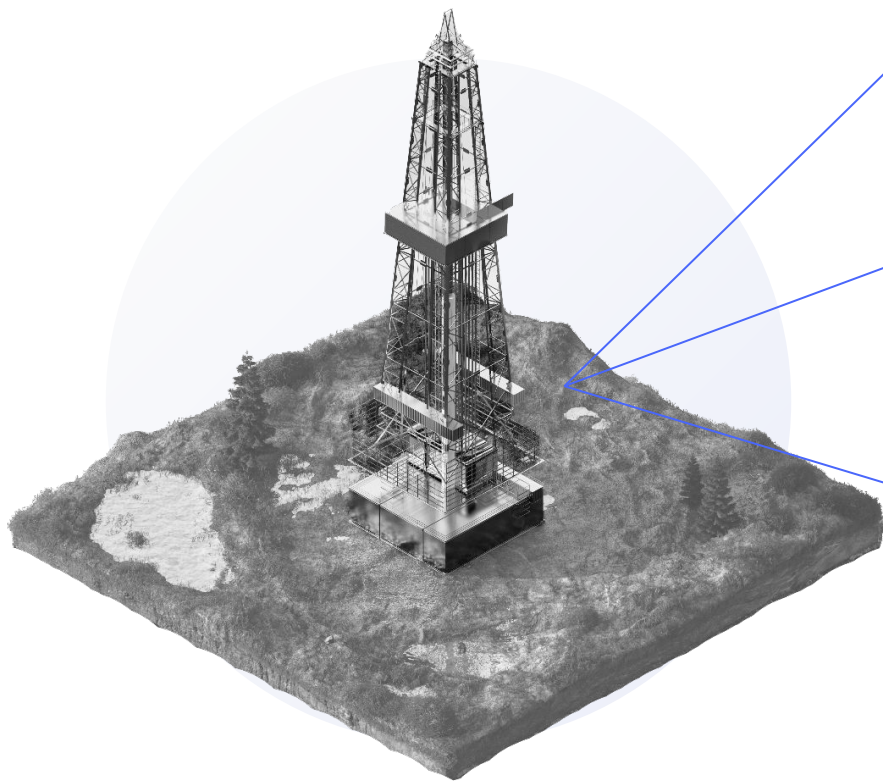


Section 1:

What is the generative AI opportunity to optimize production?

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



## Maximizing production efficiency

10-30% throughput increase

- More efficient ways to detect and deal with production disruptions
- Reduce operations and shutdown costs
- Extend the economic life of brownfields



## Ensuring safe and sustainable operations

30-50% reduction in emissions

- Reduce total 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 Capital' application interface. The header includes a 'Menu' button, a search bar, and navigation links for 'Data Center', 'Data Center', 'Data Center', and 'Data Center'. The main content area shows a task description: 'Calculate the excess power consumption (in megawatts) of our Otsu manufacturing plant over the past week.' Below this, a calculation result is shown: 'Excess power consumption = Otsu: 2,384 MWh'. A line graph is displayed, showing 'Excess power consumption (in MWh)' on the y-axis and 'Date' on the x-axis. The graph shows a steady increase in power consumption over time. A blue book icon is overlaid on the right side of the screenshot.

# Code Generation

The screenshot displays the 'Industrial Copilot' web application. The top navigation bar includes 'Home', 'My collections', 'Data Catalog', 'Build', and 'Manage'. The main content area is titled 'Industrial Copilot' and 'Experience the power of Digital Data Fusion and artificial intelligence.' Below this, a task is defined: 'Define an filter to find all pumps made by Honeywell after 2015 in the compounding plant, serviced in January, that have had high upstream pressure spikes lasting more than one minute in the last 6 months.' The application then generates a JSON response, which is highlighted by a red box and a magnifying glass. The JSON defines a filter for pumps, including criteria for manufacturer, date, and pressure spikes.

```

{
  "filter": {
    "name": "Pumps made by Honeywell after 2015 in the compounding plant, serviced in January, that have had high upstream pressure spikes lasting more than one minute in the last 6 months",
    "description": "Pumps made by Honeywell after 2015 in the compounding plant, serviced in January, that have had high upstream pressure spikes lasting more than one minute in the last 6 months",
    "criteria": [
      {
        "name": "Manufacturer",
        "value": "Honeywell",
        "operator": "equals",
        "isAnd": true
      },
      {
        "name": "Date",
        "value": "2015-01-01",
        "operator": "greaterThan",
        "isAnd": true
      },
      {
        "name": "Pressure Spikes",
        "value": "1",
        "operator": "greaterThan",
        "isAnd": false
      }
    ]
  }
}

```

The screenshot displays the 'Industrial Copilot' application interface. At the top, there's a navigation bar with tabs: 'All', 'My collections', 'Data Catalog', 'Rollout', and 'Manage'. Below this, the main header area includes the application name 'Industrial Copilot' and a subtitle 'Experience the power of Cognitive Data Pools and artificial intelligence.' To the left, a sidebar contains a search icon and a list of items. The main content area features a search bar and a list of items. The first item is a query: 'Show me all of the pumps made by Honeywell after 2010 in the compounding plant, serviced in January, that have had high operation pressure spikes lasting more than one minute in the last 4 months.' Below this, a section titled 'Here is a list of the 4 pumps that match your query:' presents a table of results. The table columns are 'Equipment ID', 'Manufacturer', 'Location', 'Date serviced', 'Operation pressure', and 'Highest spike in 1 week'. The results list four pumps with their details and associated pressure spike graphs.

Equipment ID	Manufacturer	Location	Date serviced	Operation pressure	Highest spike in 1 week
Pump: 20-P1-009	Honeywell	Compounding	January 10, 2023	4.1 bar	18.0-4.0 January 16, 2023
Pump: 20-P1-021	Honeywell	Compounding	January 10, 2023	3.2 bar	18.0-2.0 February 5, 2023
Pump: 20-P1-028	Honeywell	Compounding	January 20, 2023	3.9 bar	18.0-10.0 March 5, 2023
Pump: 20-P1-403	Honeywell	Compounding	January 20, 2023	2.8 bar	18.0-0.0 March 8, 2023

At the bottom, there's a section for 'Open a response, question, or query...' with a text input field and a play button icon.

**"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.

"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.



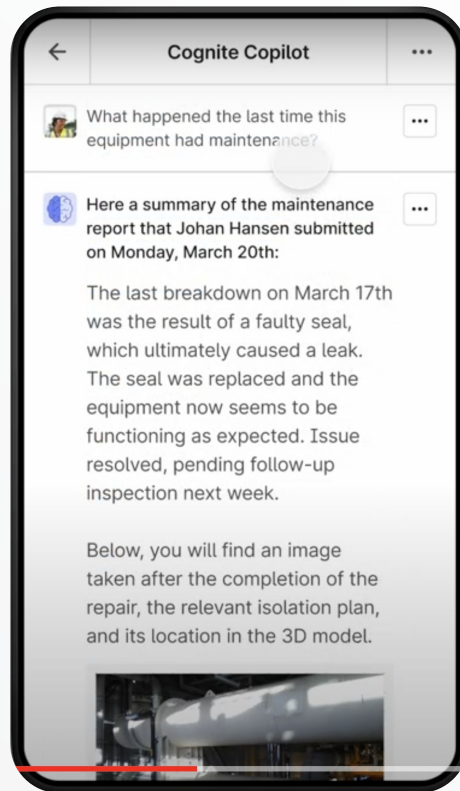
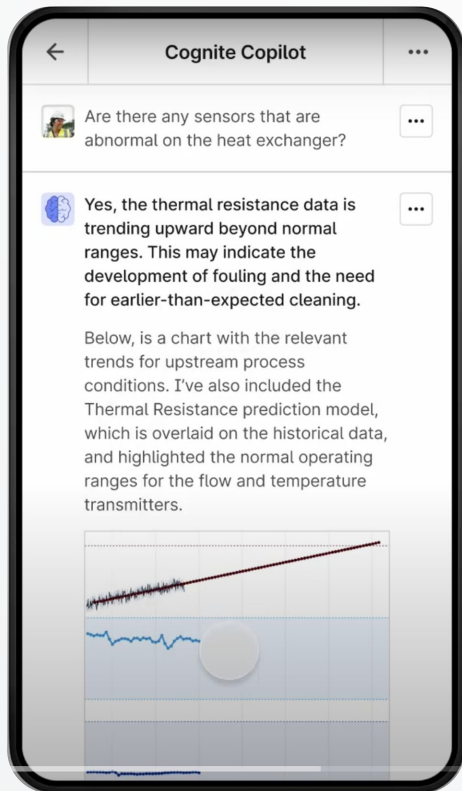


Use case:

## 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.*

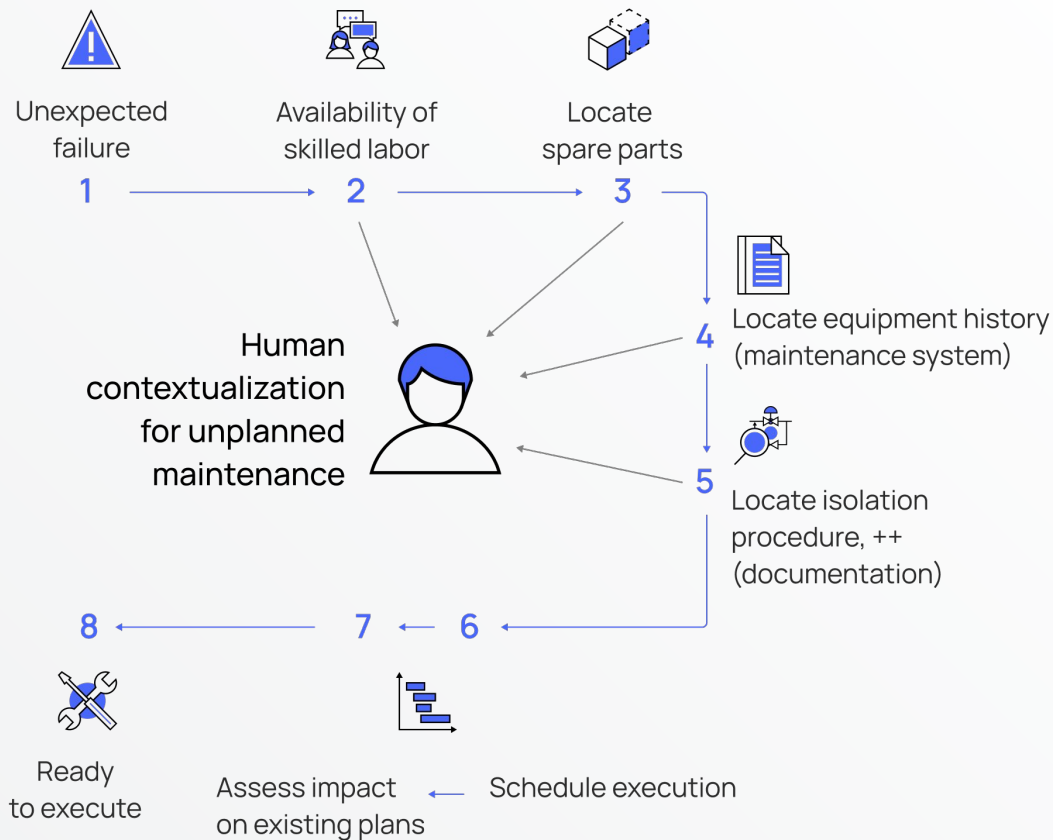


Use case:

## 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:

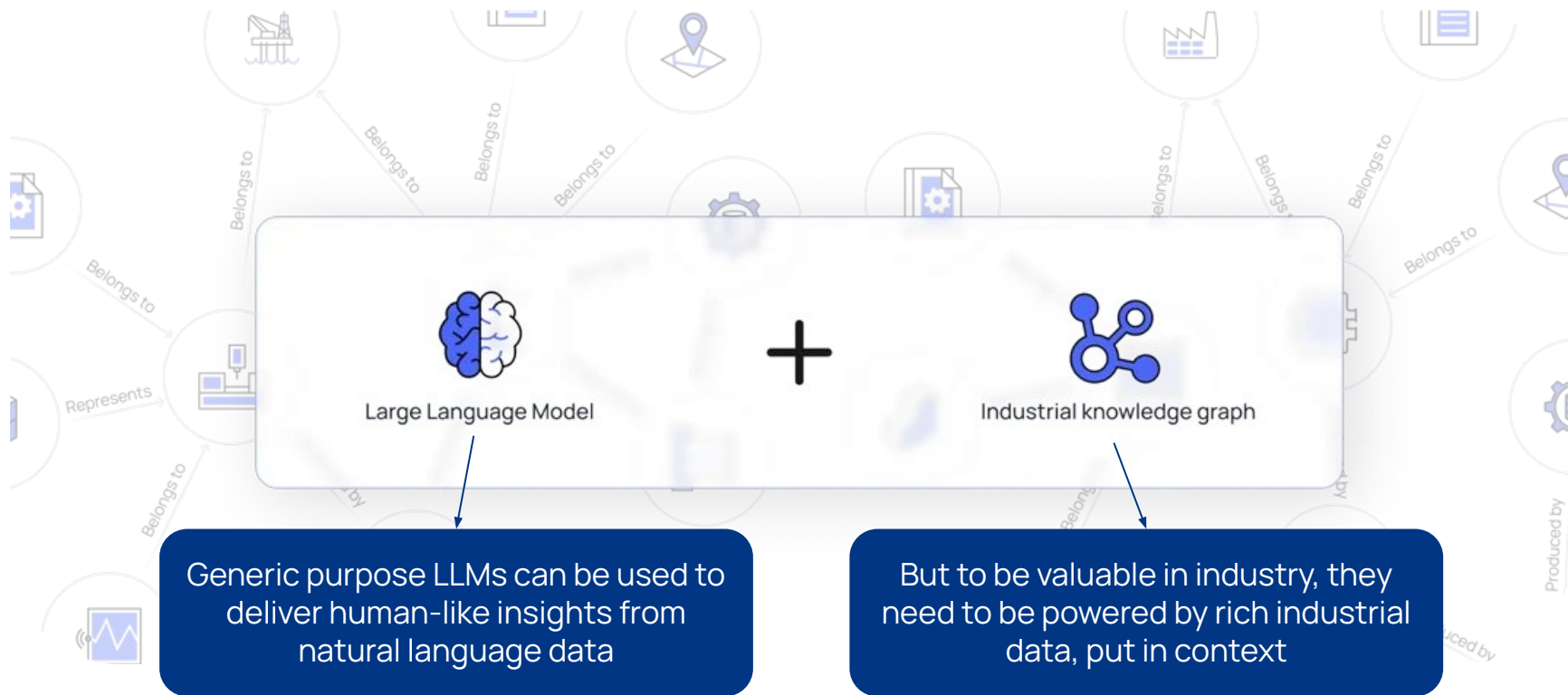


Section 2:

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





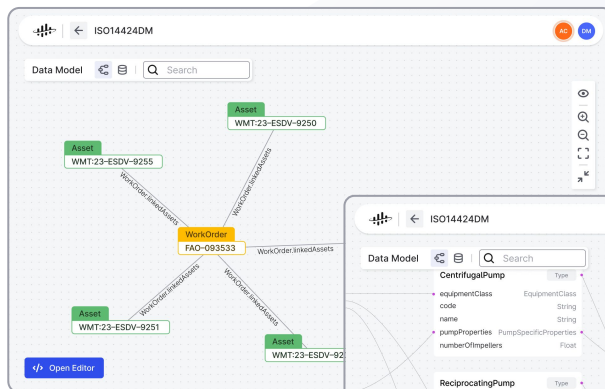
# The industrial knowledge graph enables deployment of co-pilots and more, while serving as a foundation for scaling site-to-site

## Automate data contextualization

- AI-powered contextualization services
- Mappings maintained automatically

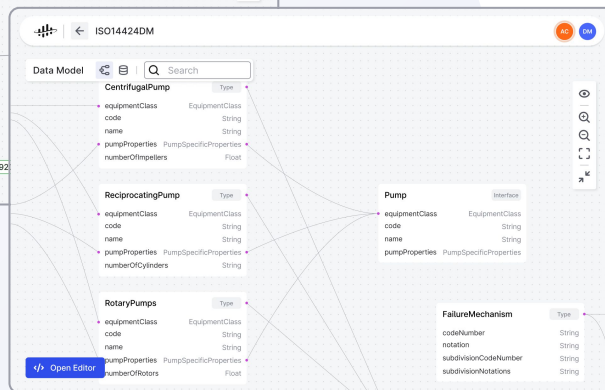
## Contextualize all data types

- 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

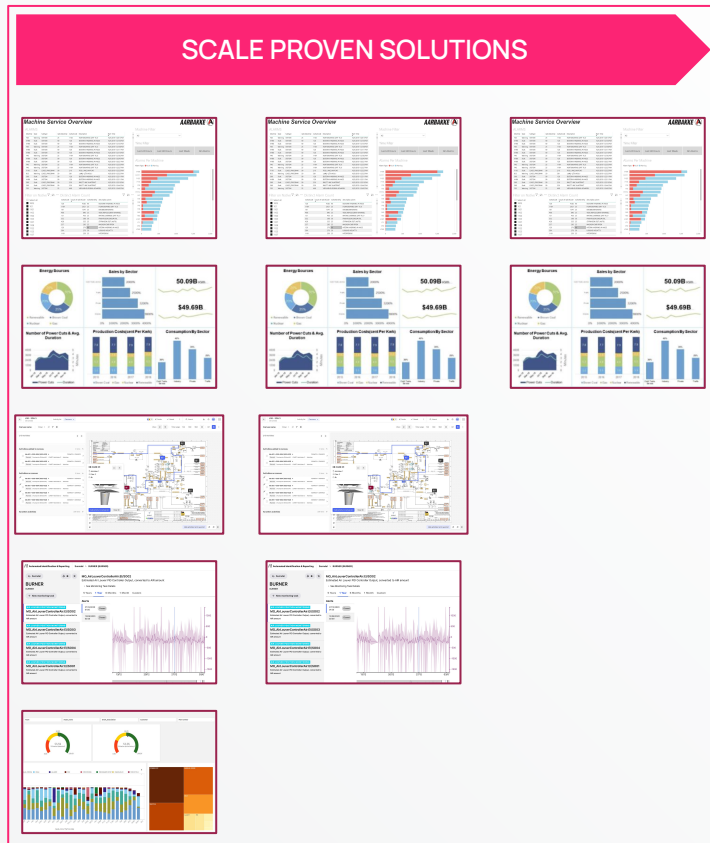
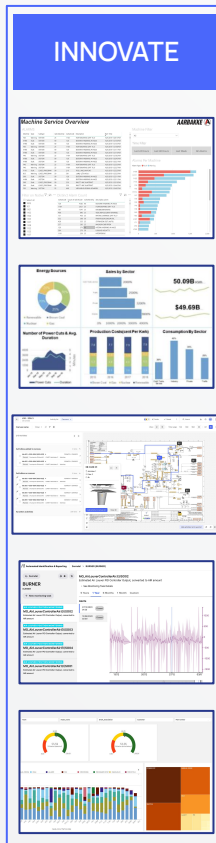
Rapidly scale proven solutions across production assets and fields

### 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



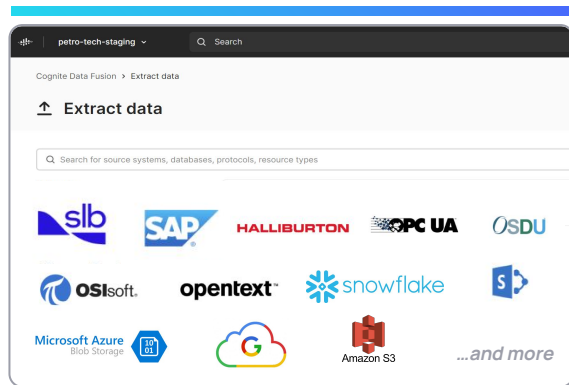
Section 3:

## Where and how to get started

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

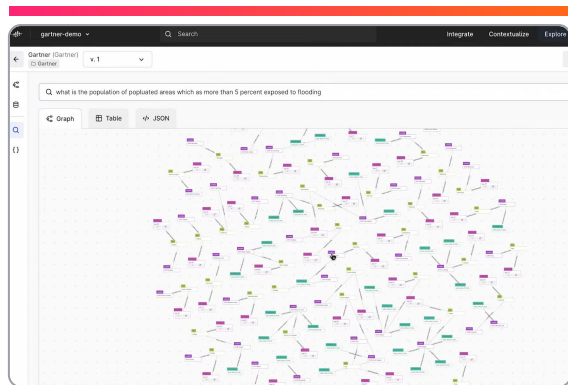
# Getting Started: Prerequisites and order of operations

## Liberate data



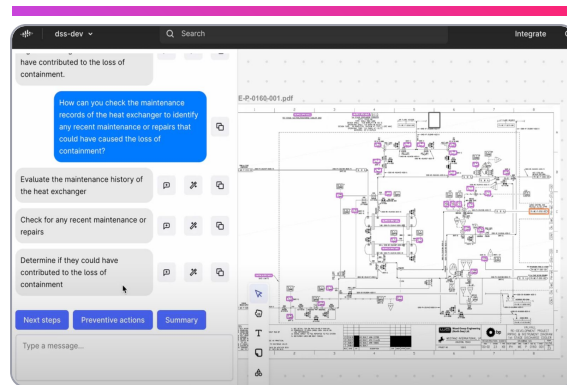
- All OT, IT and engineering data - **contextualized with AI**
- **Pre-built extractors** into common industrial sources and protocols
- Everything is accessible through a well-documented, open API

## 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

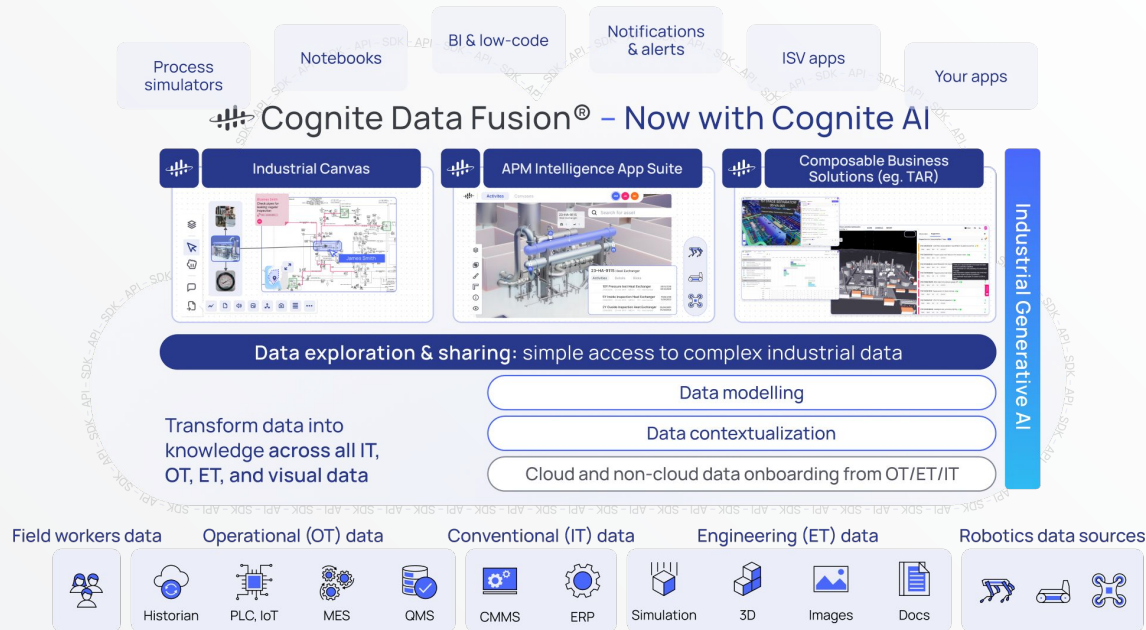


- Collaborative workspace for any data type (interactive P&IDs, 3D Models, and more)
- **AI-copilot** to find relevant data, no-code capabilities to create summaries, solutions, conduct root-cause analysis and make recommendations

# Cognite offers comprehensive capabilities to accelerate your AI roadmap

→ Get in touch:  
[cognite.com/contact](https://cognite.com/contact)

→ Get a free AI value review:  
[cognite.com/en/value-review](https://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

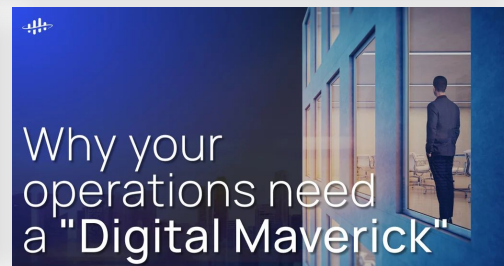
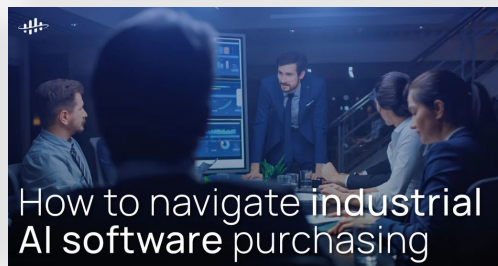
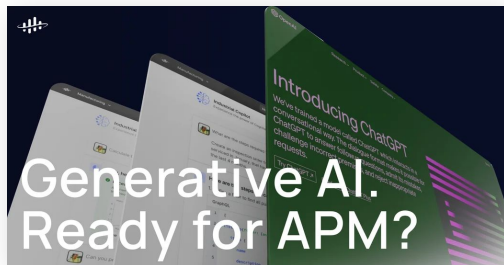
## Data Modeling

Save thousands of domain expert hours

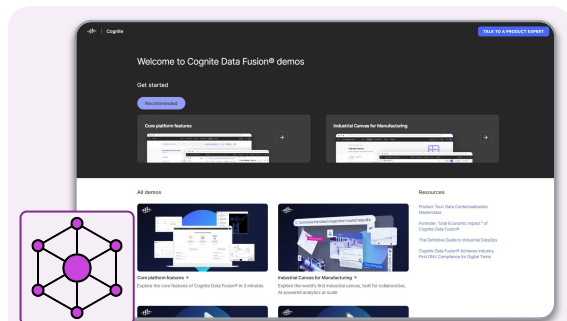
## Industrial DataOps

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

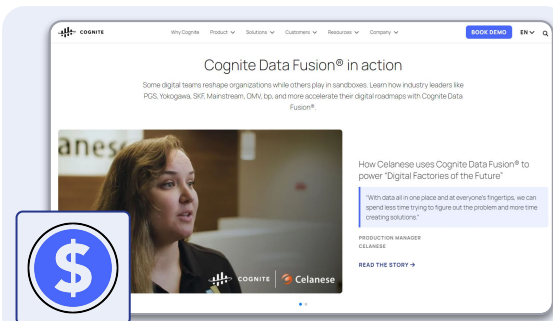
# Learn more about Generative AI



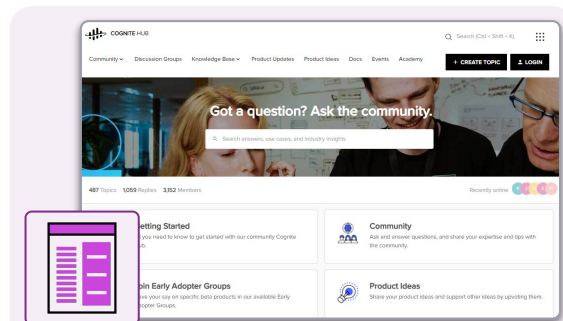
# Learn more about Cognite



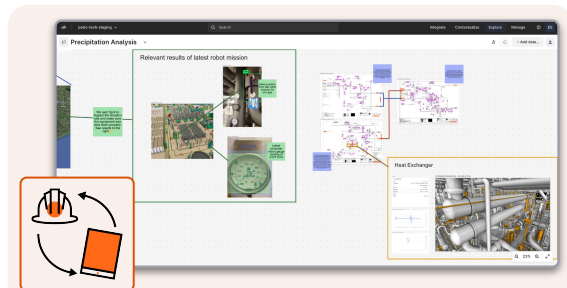
**Cognite Demo Hub**  
Explore Cognite Data Fusion



**Customer Stories**  
Cognite success stories



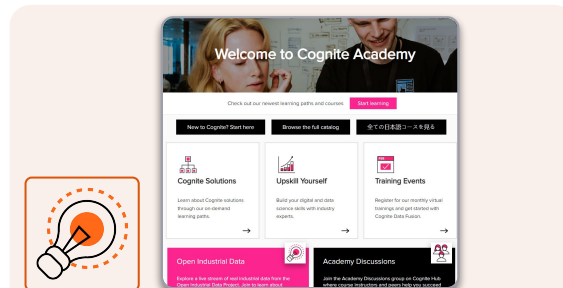
**Cognite Hub**  
Cognite's user community



**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



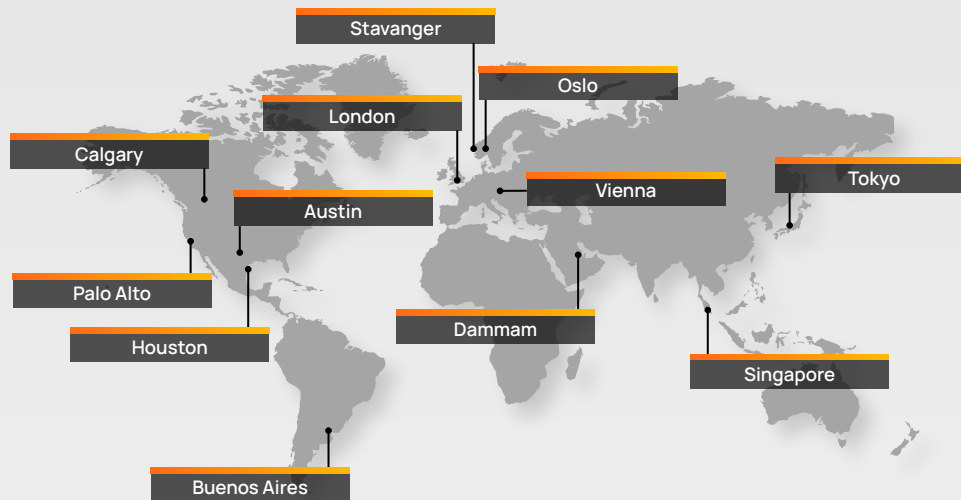
Long-term digitalization partner with 7.4% stake in Cognite



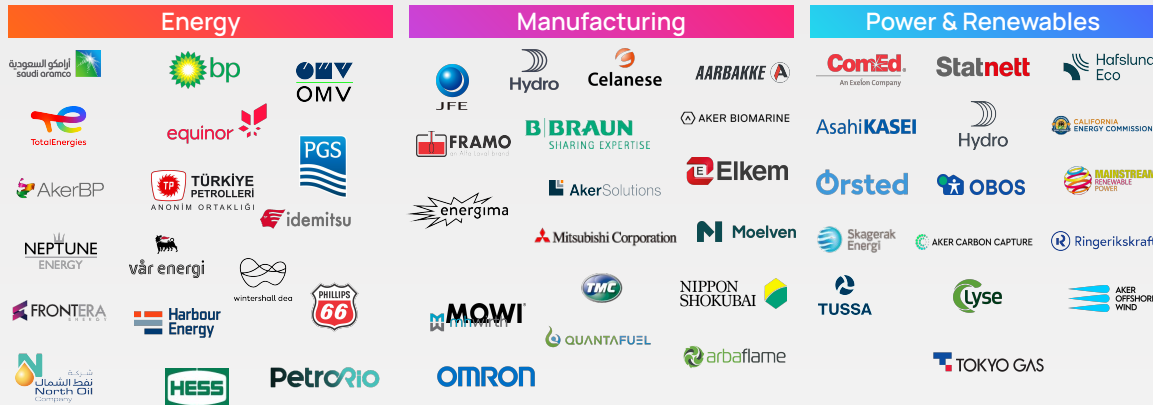
\$150M Series B (at \$1.6B) Redefining Modern industrial Data Management



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



## Our Customers:





# Thank You

[contact@cognite.com](mailto:contact@cognite.com)  
[www.cognite.ai](http://www.cognite.ai)

