Playbook:
How to Deploy, Scale, and Trust Generative AI in the Oilfield

An introduction to LLMs + Industrial Knowledge Graph
Section 1:
What is the generative AI opportunity across the oilfield?

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
Generative AI delivers a valuable layer of capabilities that amplify existing efforts to make operators more efficient and effective.

**Content Generation**

“What is the highest temperature of equipment 21PT today? Did this equipment exceed normal temperature range last week?”

“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.

**Summarization**

“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 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.

**Code Generation**

“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.

**Semantic Search**

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“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.”
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:
Create simple access to industrial data and cross-source insights
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:
Optimize planning, scheduling, and execution of activities

Human contextualization for unplanned maintenance

- Unexpected failure
- Availability of skilled labor
- Locate spare parts
- Locate equipment history (maintenance system)
- Locate isolation procedure, ++ (documentation)

Ready to execute
Assess impact on existing plans
Schedule execution
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…
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?

Generic purpose LLMs can be used to deliver human-like insights from natural language data.

But to be valuable in industry, they need to be powered by rich industrial data, put in context.
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

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**Industrial Canvas**

**Generic-Purpose LLM’s without industrial context**

**Data sources**

- Field workers
- Operational (OT)
- Conventional (IT)
- Engineering (ET)
- Robotics

**Retrieve Augmented Generation (RAG)**

ML Assistant for industrial context

**Industrial Knowledge Graph**

Built using Cognite Data Fusion®
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 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, CFHOS, 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®

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Value</th>
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<tr>
<td>Gain in SME Efficiency</td>
<td>1-2%</td>
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<tr>
<td>Reduced Downtime</td>
<td>1-5 days</td>
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<tr>
<td>Gain from Data Productivity</td>
<td>1%</td>
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<tr>
<td>Reduced Maintenance $</td>
<td>2-3%</td>
</tr>
<tr>
<td>Increased Machinery Optz</td>
<td>2-3%</td>
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<tr>
<td>Less Energy $</td>
<td>7-8%</td>
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**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

Generative AI. Ready for APM?

GPT *thrives* on operational context

What you need to know about Retrieval Augmented Generation

5 things you need to know about Generative AI for industry

How to navigate industrial AI software purchasing

Why your operations need a "Digital Maverick"
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:

Energy

Manufacturing

Power & Renewables

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Thank You