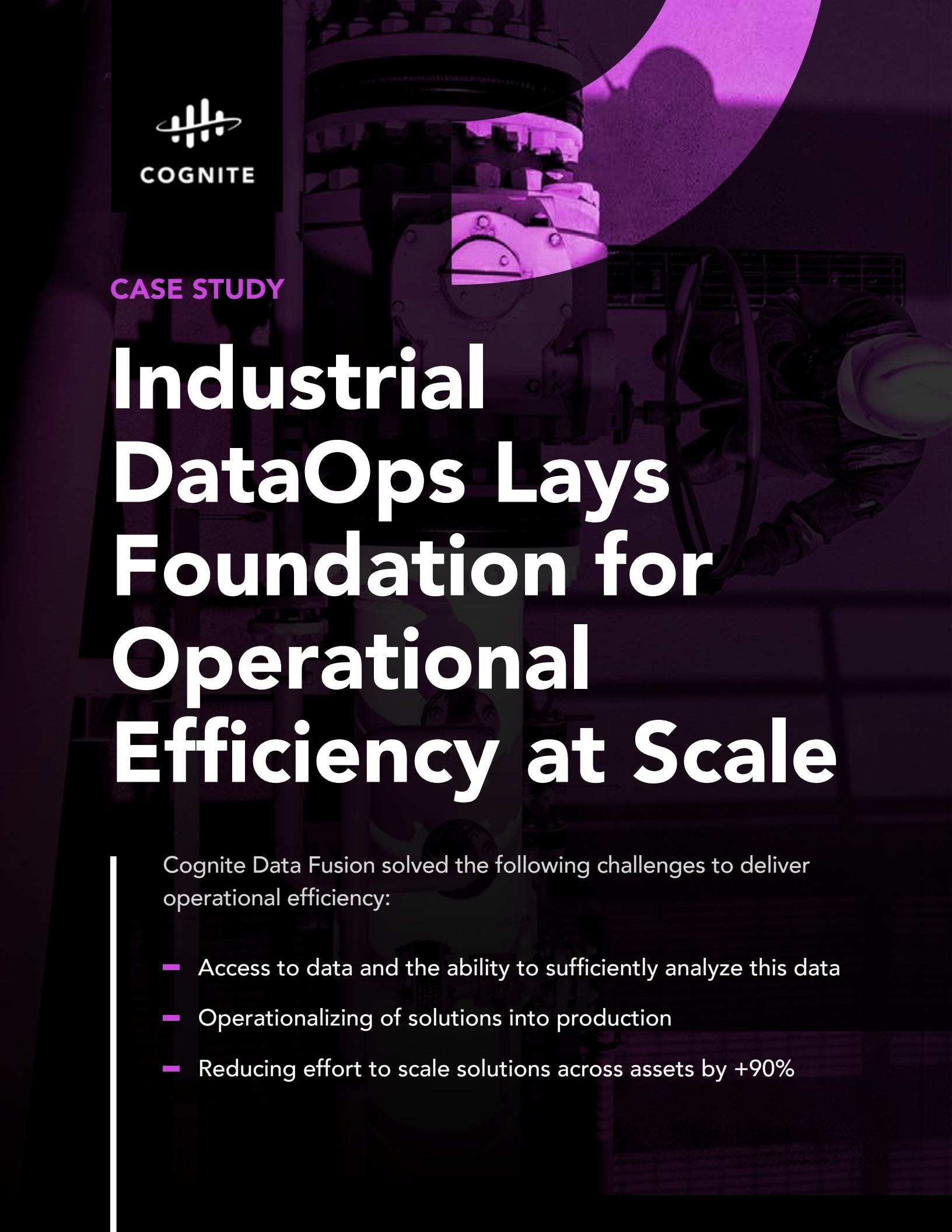


COGNITE

CASE STUDY

Industrial DataOps Lays Foundation for Operational Efficiency at Scale

Cognite Data Fusion solved the following challenges to deliver operational efficiency:

- Access to data and the ability to sufficiently analyze this data
- Operationalizing of solutions into production
- Reducing effort to scale solutions across assets by +90%

SECTION ONE

Seeking a Solution to Improve Maintenance

By leveraging Cognite Data Fusion, first for one asset, and then quickly scaling to 29 across their portfolio, a major offshore oil operator ('the Operator') reduced planned shutdowns by 30%, boosting production by approximately 7,000,000 barrels annually: an estimated value of $38 million in gains.

Solving for Complexity in the Industrial World

The Operator has 30 oil platforms with more than 300 wells. Like most operators, they lacked a unified overview of maintenance activities within and between all assets. This prohibited them from optimizing the scheduling, realizing synergies between assets, communicating across organizational silos, and making data-driven decisions.

The Operator's goal was to make use of the intelligence hidden in their equipment by using their existing data to develop solutions for operational efficiency.

With the desire to leverage scalable digital technology, The Operator established a DataOps platform to fully leverage and integrate existing data sources. Once the data was contextualized and a foundational data model was created, AI capabilities were used to analyze the data.

Multiple solutions could then be created, enabling operational efficiency. These include maximizing production, reducing the carbon footprint, and reporting sustainability progress.

Beginning the Digital Journey

Maintenance management is a critical workflow that is ideal for digital optimization. Offshore O&G platforms must maintain thousands of components, including hundreds of complex rotating equipment components, from multiple vendors, with critical information stored in multiple data silos.

Moreover, the cost of being wrong is exorbitant for safety, environmental, and production. Planned and unplanned maintenance often results in deferred production, costing the Operator millions of dollars each year in unplanned events.

While many solutions could be deployed, the Operator focused first on maintenance production deferments. By focusing on maintenance first, the Operator could use AI to help optimize how they planned, managed, communicated, and made decisions about their asset maintenance.

This operator asked themselves:

- **How can we approach unplanned deferments in a more grounded, data-driven way?**
- **How do we use analytics to better plan, manage, and communicate our maintenance activity?**
- **How do we make use of the investments made across the whole fleet?**

SECTION TWO

Solving the Challenge with Industrial DataOps

The Operator wanted to improve the time to value, quality, predictability, and scale of the operational data analytics life cycle at their organization. The goal was that many future projects would reap the rewards of this digital investment. So it was critical to approach the problem at the foundational level. By using Cognite Data Fusion as the foundational Industrial DataOps platform, a new way of managing data was set within the wider organization, enabling it to embrace growing data diversity and serve a growing population of data users.With faster time to realizing value from digital, the Operator realized direct impact on its bottom line.

25x

Faster deployment of solutions to live production use

Execution

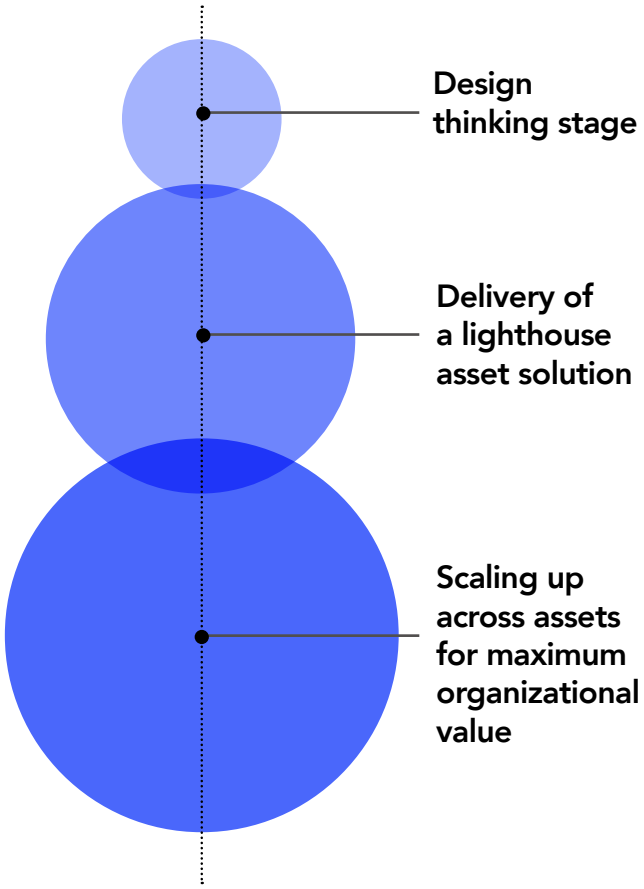
Setting the foundation for operationalizing data and leveraging AI models that deliver trustworthy insights can be a difficult task at a large organization.

The Operator experienced challenges with vendor-specific industrial data, isolated in multiple formats, in multiple systems of record.

In order to manage this challenge, Cognite delivered three phases to unlocking value.

Across these three phases, value metrics were included directly into the product, to ensure that all digital investments would provide a return for the organization.

The journey to value



From theory to execution

High-level design thinking: To maximize and accelerate value delivery, it's important to assess which use cases will have the highest impact for the least amount of effort, and prioritize the data that will support those use cases.

This was done through a **design thinking stage** when Cognite and the Operator collaborated to define a baseline performance.

Working together, they visualized the current state, defined the business issue, discovered the problems with existing processes, identified the data types and data sources to ingest into a DataOps pipeline, design human-data-analysis solutions, developed a roadmap to value and KPIs, and agreed Phase 1 scope and schedule.

In this workshop, it was established that maintenance workflows stood to gain the most from the DataOps workflow.

The Operator was spending lots of time and money on maintaining components across multiple vendors with information stored in different data silos. The safety, environmental, and production implications of any issues were significant. Whether planned or unplanned, maintenance often resulted in deferred production, costing millions of dollars each year.

Before Cognite Data Fusion Deployment.

Platform was responsible for solution rollout.

Manual maintenance planning process included many people and many touchpoints.

The Operator suffered from production losses and inefficient use of resources.

Delivery of a Lighthouse Asset Solution

Cognite and the Operator worked together to create an interactive maintenance planner application to help optimize efficiency and reduce waste by enabling efficient scoping, planning and execution of maintenance work. The application is built around four core ideas:

1. **A tool that connects worker orders and risk factors (such as defective valves, integrity threats, and out-of-service equipment) to a 3D model to give a visual overview of a selected platform.**

2. **The functionality to help plan maintenance campaigns by reassigning work orders into different campaigns.**

3. **A drag-and-drop interface for sequencing work orders.**

4. **Automatic reports to provide the user with visibility on performance in real-time.**

The application works in a sequence of four steps:

Step One: Data is unlocked from different source systems and collected in Cognite Data Fusion. This includes 3D models, work orders from SAP, risk factors from eCow, SAP, and Synergi, and piping and instrumentation diagrams (P&IDs) from Prodom.

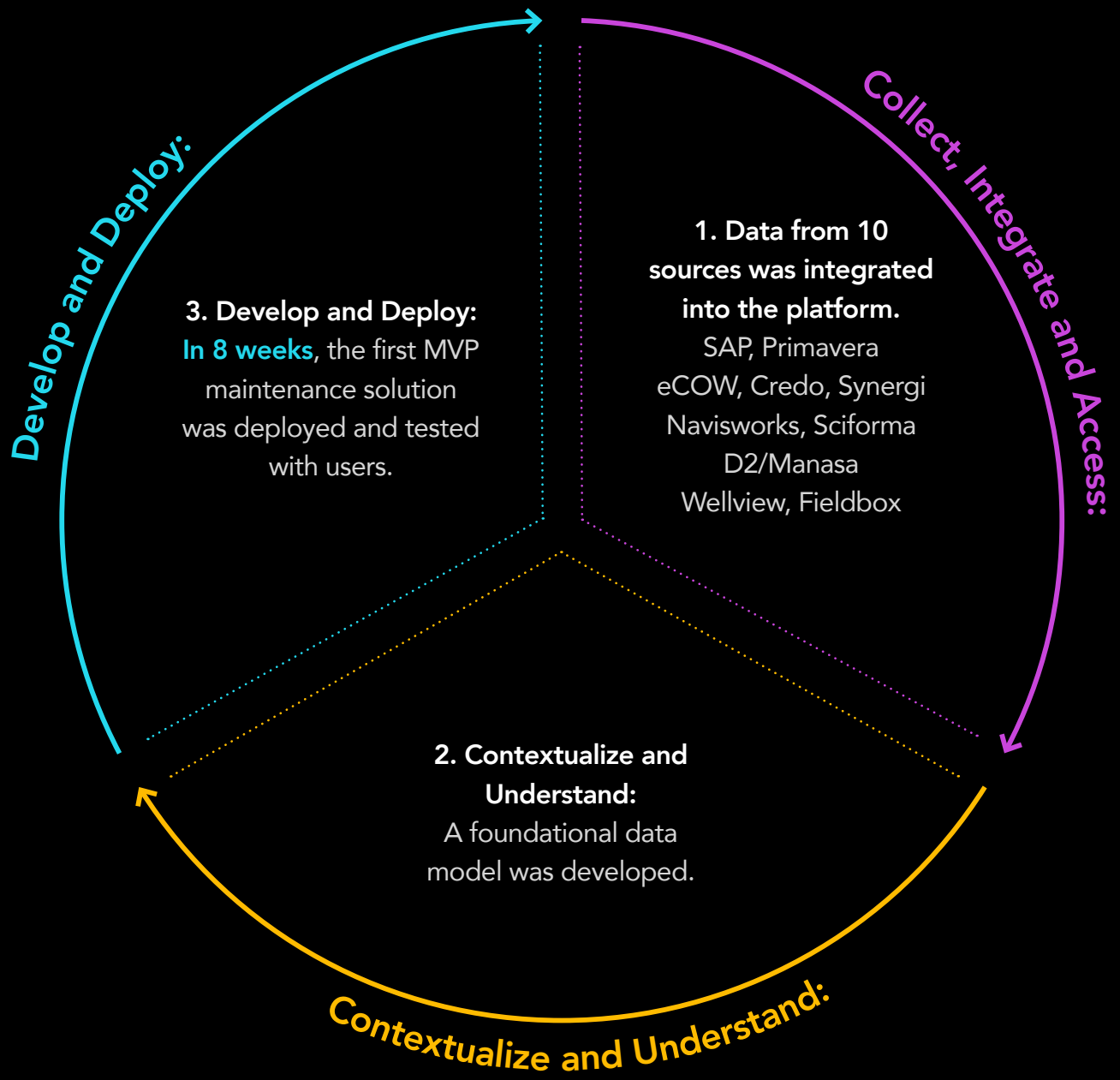
Step Two: The home screen of the application displays a list of work orders prioritized by risk factors and maps them to a 3D model of the platform.

Step Three: The work orders can be filtered or bundled to further organize the information.

Step Four: Once a campaign has been planned, the user is then presented with a simple drag-and-drop scheduling chart. Previously, this sequencing was performed in a spreadsheet.

The Journey From Raw Data to Maintenance Solutions

Cognite and the Operator worked together to develop a DataOps pipeline for a single asset.



1 asset | ~1000 work orders | 3 users | 2 months

SECTION THREE

Industrial DataOps, Built for Scale

By approaching the solution with Industrial DataOps, the effort to deploy the same solution across all assets was reduced by 216 weeks.

A single solution alone provides value to the organization, but the true value is realized in the moving of a solution across the whole fleet of assets.

By leveraging the data model and processes developed in Phase1, the maintenance solution could then be applied to other assets quickly, accelerating value delivery.

For the Operator, this meant applying the data model, contextualization, and connections from the first asset to 29 other assets across their portfolio, over 300 users.

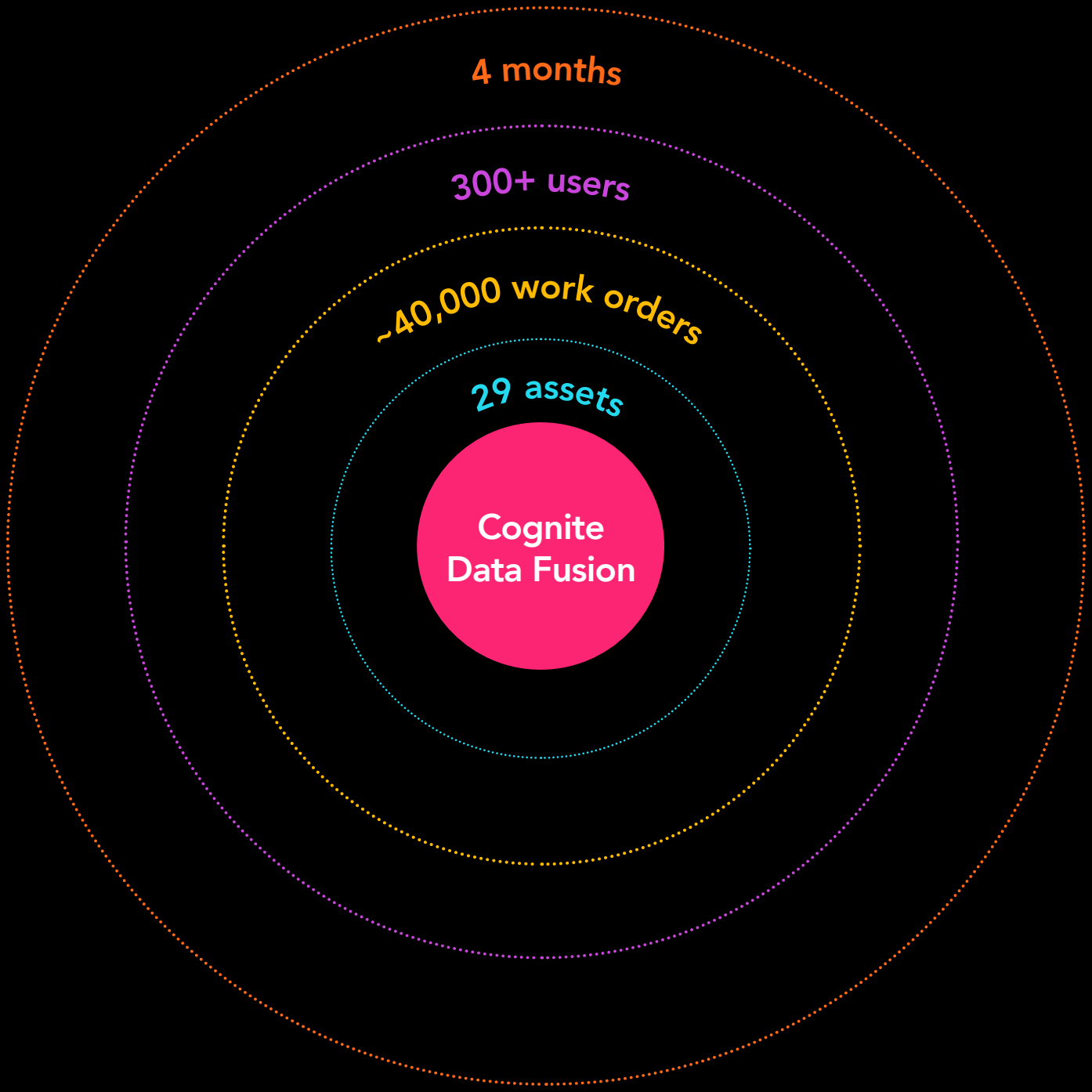
By leveraging Cognite Data Fusion, the Operator reduced planned shutdowns by 30%, boosting production by approximately 7,000,000 barrels annually, an estimated value of $38 million in gains.

Maintenance solutions: After implementing Cognite Data Fusion

Full fleet of assets are using maintenance solutions in production.

AI models are calculating maintenance plans based on real-time performance.

Efficient resource utilization and reduced waste by creating cross-asset synergies, driving higher sustainability and reduced carbon emissions.


4 months
300+ users
~40,000 work orders
29 assets
Cognite
Data Fusion

The new solution delivered:

Improved visibility and risk alerting of out-of-spec equipment status

Better monitoring and mitigation planning of spill and gas leak risks

Lower risk to personnel was reduced by clustering higher-risk maintenance work

Reducing unnecessary exposure to risk during lower-risk work orders

Lower GHG emissions due to less frequent transport of personnel and parts

Reduction in materials usage and waste from unnecessary, schedule-driven parts replacement

SECTION FOUR

Value realized, limitless potential

The Operator finds itself in a market that is facing both significant challenges and opportunities.

Many energy companies have made bold and ambitious sustainability promises to the market and to consumers, and are using these commitments as a launchpad to explore new business opportunities and revenue streams.

This makes the efficient operation of their existing revenue streams even more critical.

For the Operator and many other organizations, profitability and sustainability increasingly go hand in hand, and efficiency initiatives have positive environmental impacts as well.

$38

million in gains by leveraging Cognite Data Fusion

Automating maintenance opens up opportunities for operations.

- Automating safety reporting to EMS and sustainability tracking and reporting
- Creating decision-supporting dashboards and scenarios to allow data-driven maintenance decisions which incorporate risk and sustainability limits
- Tracking of additional cost reduction metrics such as POB and travel, job duration, vendor performance
- Developing a joint asset-OEM data platform which allows for performance-based commercial contracts
- Realizing synergies across assets or across operators

COGNITE.COM