



OIL & GAS

Improving operational performance through digital excellence

Success for oil and gas firms depends on their ability to unlock the power of their data.



INTRODUCTION

The need to succeed against the odds

The [World Economic Forum](#) (WEF) predicts that the move to digital operations (DigiOps) has the potential to create around \$1 trillion of value for oil and gas (O&G) firms.

Industry leaders are taking note. According to [KPMG](#), more than 90% of CEOs say that digital disruption is an essential part of their growth strategy. Success will enable them to innovate more quickly, lower operational costs, and make better-informed decisions – business strengths that will define market-leading firms who are able to keep up in a digital era characterized by its rapid pace of change.

Despite this enthusiasm for digital disruption, there's no getting away from the fact that a massive [70% of digitalization projects fail](#). This rises to between [89% and 96% in industries such as O&G](#).

There are many reasons for this unsettling rate of failure, but at the top of the list are lack of agility, too many disparate silos of information, ineffective data sharing, lack of control over data, and poor internal engagement. To succeed, companies need to pay attention to each of these factors.



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Recognizing the digital opportunity

Digital excellence can fast track success for O&G companies. But what does digital excellence really mean?

It's not about simply digitizing archaic practices or implementing fancy new devices. It's about top-to-bottom digitalization, imparting a fundamental transformation in how people, processes, and equipment are connected, resulting in new efficiencies across every area of the business.

When physical assets, equipment, and people are aligned with the digital technology and software that a company uses to maintain day-to-day operations, monitor performance, and plan future strategies, the opportunities are boundless. Companies are able to optimize performance, expedite innovation, and generate additional revenue.

To be successful, only a holistic approach to achieving digital excellence will do.

Organizations must foster a digital culture throughout all dimensions of the business and its wider operating ecosystem.

Moreover, the company must focus as much on digital excellence as on the physical assets – any investment in the physical must be matched in digital competencies.



FUELING PROGRESS

Four steps to achieving DigiOps

There are four steps that O&G companies should take to achieve DigiOps:

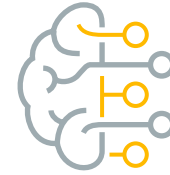




1. BREAK DOWN DATA SILOS

According to [IDC](#), 68% of the best-run midsize businesses strongly agree that getting data under control is essential for gaining and maintaining a competitive edge.

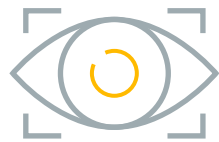
By freeing up data trapped in various silos and consolidating it, companies can significantly increase its value. Data consolidation can help improve agility, uncover unforeseen trends, and highlight hidden inefficiencies.



2. TURN DATA INTO KNOWLEDGE

Data transformation is at the heart of DigiOps. While many O&G firms generate heaps of real-time data from assets throughout their upstream and downstream operations, data on its own has no meaning.

To transform the data into actionable information that can be used by both humans and machines to create a thriving ecosystem of industrial applications, companies need software that can collect, clean, and contextualize the data.



3. VISUALIZE INSIGHTS

Static reports are a thing of the past. With state-of-the-art visualization software, key stakeholders from across a business can access easy-to-understand, actionable information in just a few clicks.

With this easily accessible data at their fingertips, users can go in-depth and compare real-time and historical data models to unearth trends, optimize processes, and enable more proactive operations – or zoom out and view 3D models powered by sensor data to get to grips with what’s happening across assets and regions.



4. OPTIMIZE YOUR OPERATIONS

Armed with detailed insight into their business, O&G firms can optimize their operations in unprecedented ways, enabling them to perform with greater efficiency and productivity. Suppliers can be incentivized on performance, not asset provision. Hidden cost savings can be discovered, and ongoing analysis can help:

- **MAINTAIN OPERATIONAL INTEGRITY**
- **ANTICIPATE BREAKDOWNS**
- **STREAMLINE MAINTENANCE**
- **INFORM DECISION-MAKING**
- **MEET REGULATORY DEMANDS**

The result? A level of competitive advantage that has never before been possible.

How Cognite can help

Cognite Data Fusion (CDF) is a collection of microservices that empower companies in industries like O&G to liberate data, giving them accessibility, operational scalability, and contextualization.

CDF retrieves all kinds of data from disparate silos and contextualizes it, making it available as a comprehensive set in the cloud. The solution integrates seamlessly with existing infrastructures, providing O&G firms with full visibility and total control of their industrial data.

With authenticated access, authorized users are free to analyze sensor data that is presented in relation to equipment hierarchies, piping and instrumentation diagrams (P&IDs), 3D models, maintenance logs, environmental data, and more.

This intelligence can be shared with selected stakeholders, benefiting the entire ecosystem and enabling truly informed decision-making.



THE PATH TO DIGITAL EXCELLENCE

Connecting the physical and digital worlds

Ultimately, digital excellence is about the successful integration of the physical and digital worlds. By combining DigiOps with physical assets, O&G firms are able to become more streamlined and operate with greater accuracy.

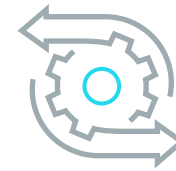


There are four parts to this transformation:



1. SENSORIZING ASSETS

The Internet of Things (IoT) acts as a bridge between the digital and physical worlds and is at the crux of Industry 4.0 – the Fourth Industrial Revolution that is characterized by smart and autonomous systems fueled by data and machine learning. By using the internet to connect sensorized devices spanning every system at every installation, O&G firms can improve visibility and reliability, optimize operations, and create new value from data.



2. AUTOMATION

According to the [WEF](#), automation represents a \$220 billion opportunity for O&G firms. The combination of technologies such as IoT, robots, and drones will accelerate real-time, data-driven decision-making processes, automating a wide range of tasks spanning drilling, onshore and offshore pipelines, refineries, and more.

Increased automation will also help mitigate risk and prevent accidents, especially in remote or dangerous operating environments, by reducing the number of people required to carry out the most hazardous aspects of fieldwork.

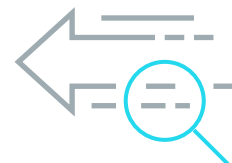


3. REMOTE MONITORING AND PREDICTIVE MAINTENANCE

[Baker Hughes research](#) has found that unplanned downtime costs offshore O&G organizations an average of \$38 million annually.

For the worst performers, the losses can reach up to \$88 million.

By monitoring assets and systems using IoT, O&G firms can fetch data from sensors to scrutinize performance, identify unusual behaviors, and predict failure before it happens.



4. DATA LIBERATION

Seamless data sharing, both internally and throughout the entire supply chain, is essential to achieving digital excellence. Any industrial data, from any system, can be aggregated and contextualized.

The more data available, the richer the context. With a single view of all assets and locations, all stakeholders – from an offshore field worker to a regulatory body – can access contextually enhanced, real-time data whenever and wherever they need it.



THE ULTIMATE GOAL

Modernized processes

The firms that achieve digital excellence by connecting the physical world with DigiOps will be able to modernize key processes.



Intelligent robots powered by IoT data, for example, will improve the accuracy and precision of time-consuming, error-prone tasks, delivering greater consistency and enabling the organization to spend more time on in-depth, analytical work. Meanwhile, robotics used in extreme and unpredictable environments will not only provide huge economic benefits, but potentially save lives.

IoT in O&G has also laid the foundation for open data ecosystems and new ways of collaborating. O&G firms can work with suppliers and partners situated anywhere in the world, enabling them to be more innovative in their design processes and solve problems far more proactively.

The epitome of connecting physical assets with DigiOps is digital twins, which promise to open the door to even more transformation for the O&G industry. By creating complete 360-degree digital replicas of a physical asset such as pipelines, turbines, pumps, or entire plants, O&G firms can explore ways to optimize processes and improve capital investments in the virtual world without risk, before applying them in the real one.



Conclusion

In the face of constant pressure to optimize performance, innovate faster, and reduce costs, digital excellence should be the primary goal for today's O&G firms. Cognite Data Fusion (CDF) is the solution to deliver digital excellence.

By aligning DigiOps and physical assets – recognizing them as one and the same, rather than separate ventures with different missions – CDF empowers organizations to become true pioneers, using the latest technologies to automate manual processes and enable the human and robotic workforces to work in tandem.

As digital twin technology comes to the fore, even greater efficiencies and innovation potential will be realized.



None of this is possible without data. CDF carefully harvests, consolidates, manages, and contextualizes data, then liberates it for wider use, allowing O&G companies to achieve data excellence. This will create a unique opportunity to achieve DigiOps and, in turn, digital excellence.

The current operating conditions are ripe for this transformation. The O&G firms that realize the full promise of digital excellence will buck the trend and deliver digital projects that put them well ahead of the competition.





Want to speed up your O&G company's journey to digital excellence? See for yourself how Cognite Data Fusion can give you a crucial competitive advantage.

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