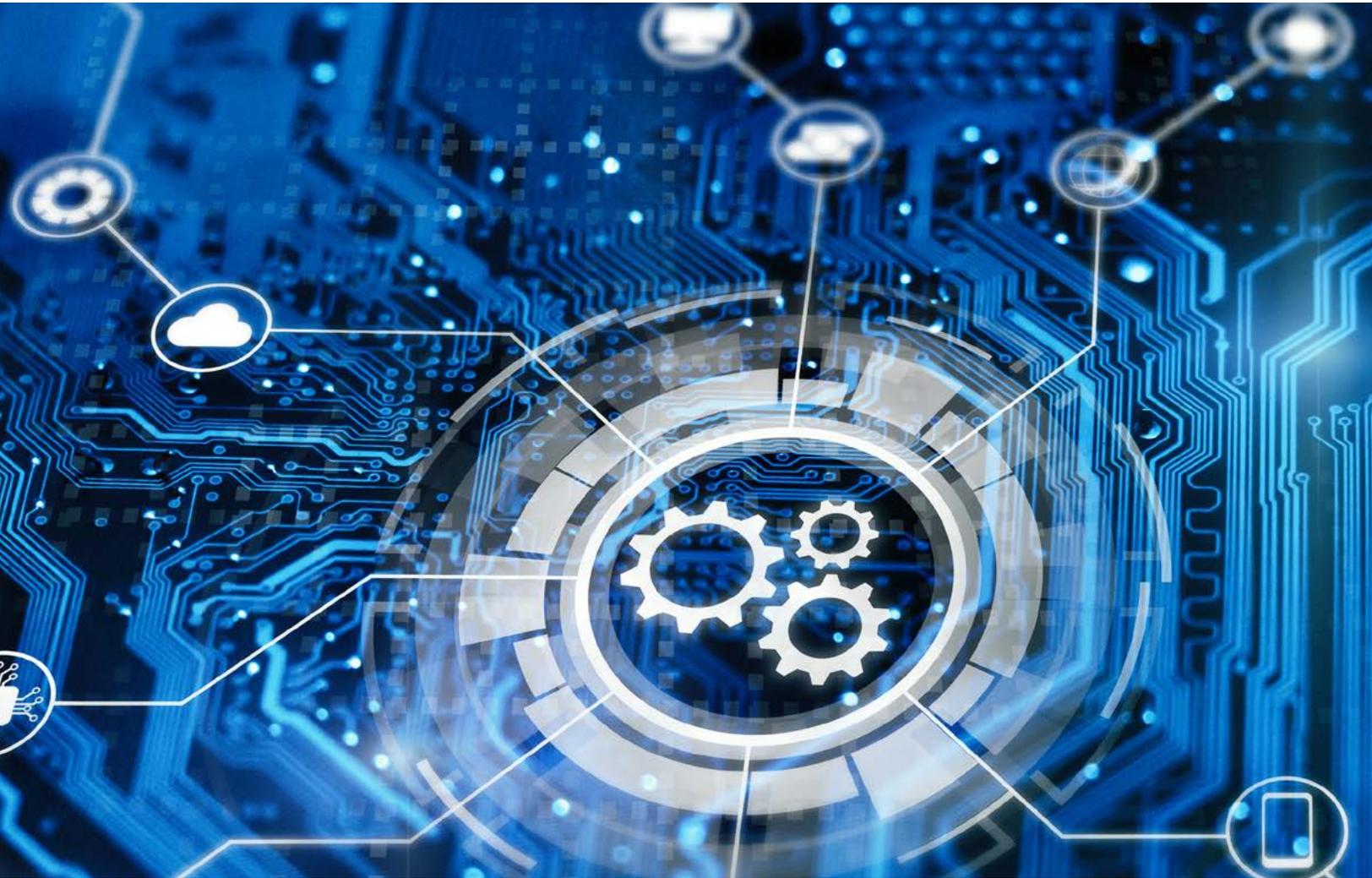


*Powering clients to a future shaped by growth*



A Frost & Sullivan Executive Summary

# Modernizing Energy: Why a Technologically Progressive Industry Still Struggles with Legacy Data and Integration

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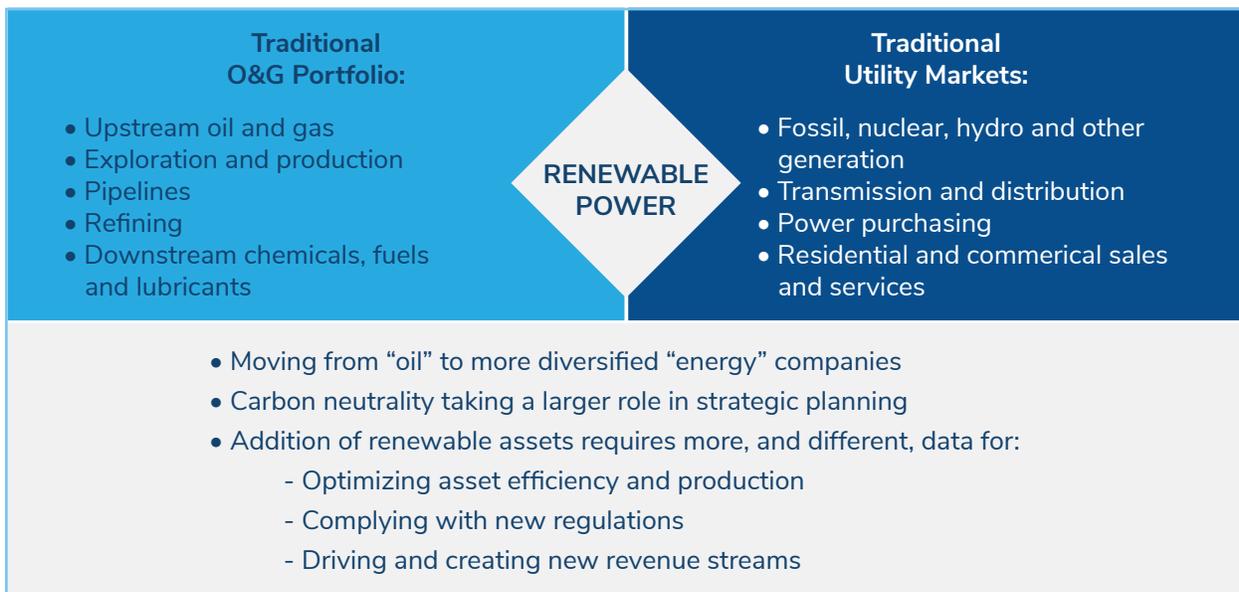
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These are tumultuous times for the oil and gas industry. Pricing challenges exacerbated by the pandemic and economic crises, mounting costs and difficulty extracting resources, and an uncertain geopolitical landscape are all affecting output and performance. Ongoing pressures to update aging systems and processes, integrate large volumes of disparate data, and develop environmentally desirable solutions like renewable energy<sup>1</sup> round out the many obstacles to be overcome.

Moving forward will require aligning and organizing complex information matrices across regions, apps and databases, and leveraging technology to improve capabilities and efficiencies. Currently, a significant amount of oil and gas (O&G) and energy data still resides in organizational siloes. In addition, it is difficult to access and leverage sometimes decades-old data stored in counties and countries around the globe. The fact that much of this data is stored both on-premises and in the cloud is another impediment. Many businesses now require advanced data management tools to address these complicated realities. Smart platforms and services can help enterprises locate, digitize, and utilize both structured and unstructured data. Data analysis can also aid in the adoption of expensive, intermittent renewable generation technologies.

Today, major global oil and gas companies are evolving from being primarily based on the extraction, refining and selling of fossil fuels to being “energy companies” in a comprehensive sense of the term, incorporating new sustainability practices and renewable power into their portfolios. By doing so, they are blurring the lines between traditional fuel suppliers and power generators such as utilities and independent power producers. These challenges include easily accessing and utilizing renewable energy resources, creating distributed energy solutions in a timely manner, and meeting new and ongoing regulations on renewable resources. Importantly, as the traditional hub-and-spoke utility model transitions into a more complex, matrixed energy model, the quality and visibility of data become paramount.

### Line Between O&G and Utility Markets is Blurring



## Tools to Help Oil and Gas Suppliers Improve Current Assets

Myriad new technologies are expanding O&G capabilities and markets, including facilitating renewable energy initiatives. These include drones, satellite imagery, augmented reality (AR), thermal imaging, and digital twins. These tools create new volumes of data that also need to be leveraged and managed. On the operations side, the traditional O&G infrastructure is not set up for real-time (RT) tracking; RT sensors and data analytics can mitigate some of these challenges. Overall, significant challenges in energy data management exist, including:

- ✓ Difficult access to legacy (physical) assets.
- ✓ Multiple document types and vast amounts of unstructured data.
- ✓ Multiple repositories/sources of truth.
- ✓ Manual, time-consuming, resource-intensive.
- ✓ Inability to find key data quickly.
- ✓ Remote, globally distributed workforce.





## New Technologies will Fuel the Growth of Clean Energy

Frost & Sullivan predicts that renewable energy will grow from 26% to over 45% of energy by 2040. As O&G majors implement renewable energy, they will need more and different types of data for effective operations and to address new regulatory mandates. For example, offshore wind installations are growing rapidly but remain expensive. The right data at the right time can help wind turbine owners, operators and builders to:

- ✓ Optimize positioning for wind speed and consistency.
- ✓ Make corrections and predictions: climate change makes it harder to predict wind patterns over time, but data and AI can help.
- ✓ Extend the life of aging installations.
- ✓ Improve prediction for energy generation, operations and maintenance (O&M), and maintenance, repair and overhaul (MRO).

## Deliver the Right Data to the Right Person at the Right Time

As industry expert Lorena Pelegrin, Digital Product Manager at Iron Mountain, told Frost & Sullivan, “Often employees are spending too much time looking for data, so they can’t get to the (more critical) data analysis. Consequently, enterprises have difficulty moving beyond the pilot stage with new initiatives.” A strong data governance strategy, one that provides “the right data to the right person at the right time” is needed. The data should be integrated and shared across siloes and the enterprise. Artificial intelligence (AI), machine learning (ML) and automation can augment data strategy and governance, minimizing redundancies and leading to better, faster implementations and results. This helps O&G companies get the most out of their existing operations and create more efficient and profitable businesses as they expand into power generation markets.

## Data Management in the Energy Industry: Some Early Use Cases

The quest now is to make relevant data available to energy organizations when needed. A use case can be found in leveraging advanced data management capabilities for mergers and acquisitions and divestitures. Where the due diligence required in these cases might previously have taken several months, with advanced data tools, the value of assets can be determined in a fraction of the time. Advanced data management in the energy sector can also help with knowledge sharing, i.e., making data readily and easily available to operators, engineers and other workers.

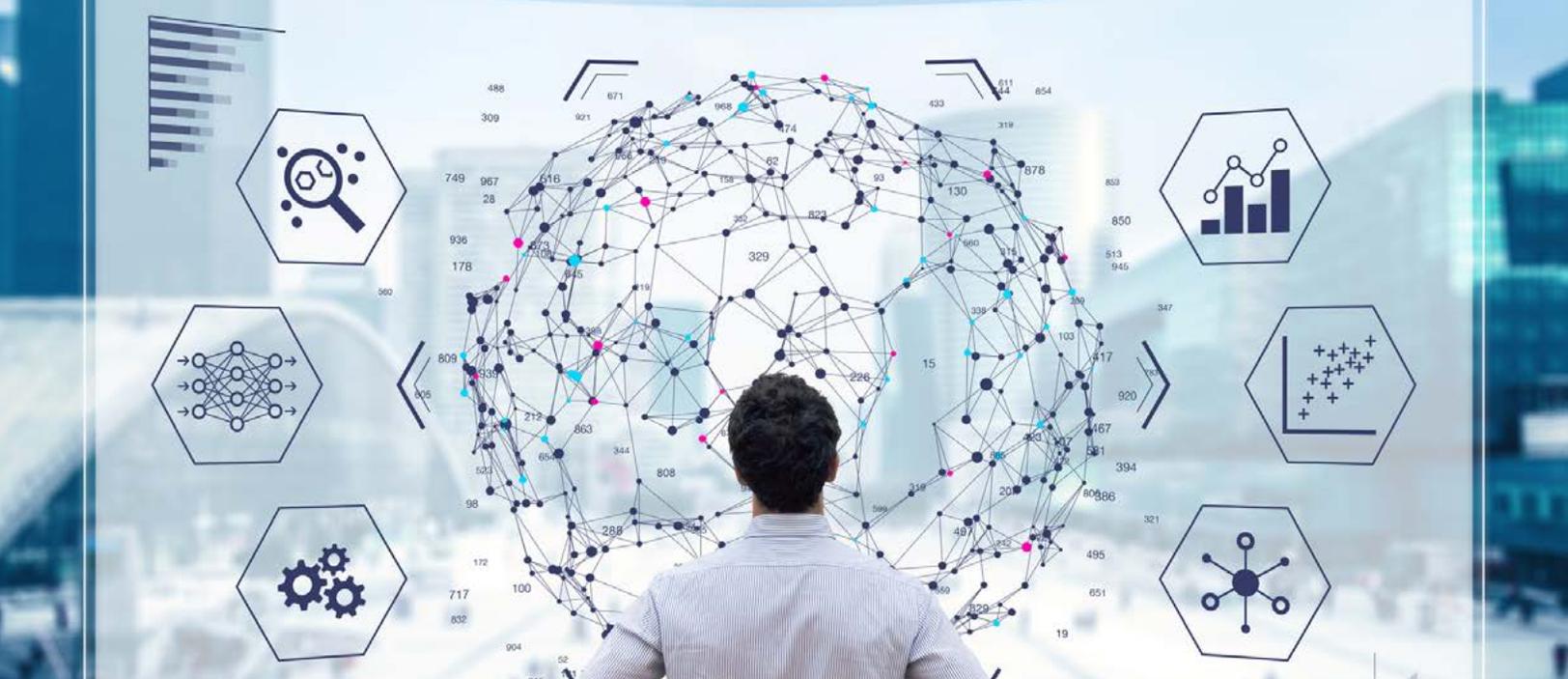
**The organizational benefits of advanced data management include:**

**Operational resilience**—enabling global access to accurate, digital, relevant data from all formats; automating and eliminating costs associated with manual checks.

**Improving strategic initiatives**—Advanced data management enables fast scaling on a global level and provides analytics to identify risks and revenue opportunities earlier.

**Drives compliance and governance**—Allows users to validate and verify document completeness and apply regulatory and legislative requirements.





Applications for advanced data management tools include:

### Early Use Cases Driven by Oil & Gas



#### O&G Subsurface Data

Search and find seismic images, well logs, and core photographs to estimate reservoir volumes and inform capital investments



#### Asset Integrity & Compliance Management

See the full picture of your assets by merging physically and digitally born data to assess maintenance needs and easily demonstrate compliance



#### Land & Data Rights Use

Process legacy, handwritten documents to verify title and land ownership for land rights negotiations or the right to use or lease seismic survey data



#### Mergers, Acquisitions & Divestitures

Quickly identify data needed to be handed over in the process of changing ownership of assets



#### Oil Corrosion Knowledge Transfer

Compile, index, identify and make available best practices to junior corrosion engineers and novel data scientists



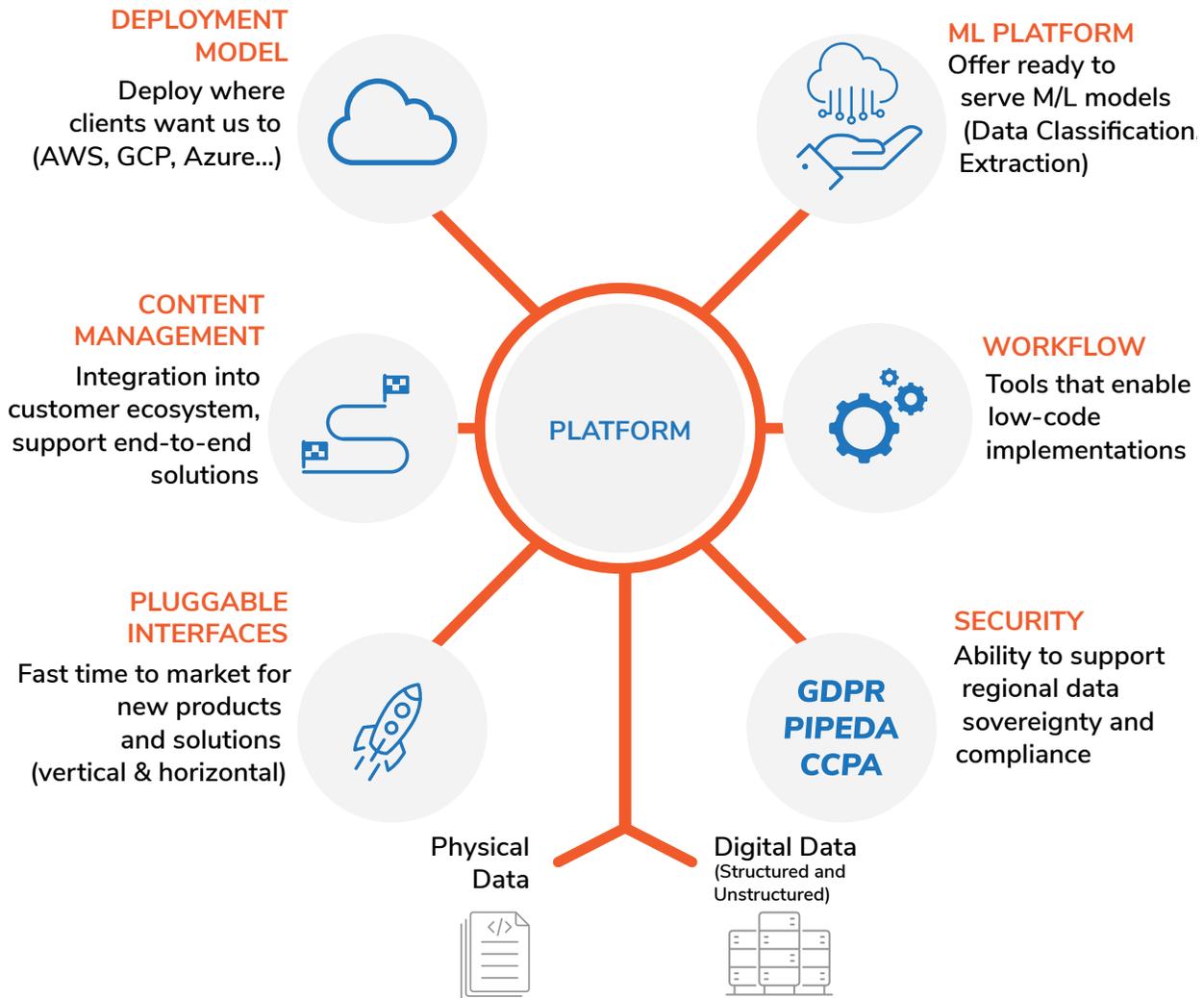
#### Contracts Management

Fast search and access to contract documentation to identify key terms, reduce risk and exposure, and facilitate negotiations

## Improving Energy Initiatives: Next Steps

As Roberta Gamble, Partner and Vice President, Frost & Sullivan, noted, “The energy industry needs to improve its data game to recognize more value.” Automating processes that increase productivity and free up an expensive and dwindling workforce to focus on higher-value tasks is a critical step. Enabling global access to data and improving decision-making with data to foster better outcomes are also crucial. Digital content management tools like the Intelligent Content Services Platform offered by Iron Mountain, an information management services company, can facilitate the transition to better data management. The platform provides “data about the data” in a convenient visual interface that can be easily navigated and leverages automated workflow models aided by analytics. The platform, which resides on the cloud, includes the following key capabilities:

### Intelligent Content Services Platform



As Gamble concluded, the right tools “can help your data work harder for you.” As the energy sector continues its transformation and use cases grow to include initiatives like utility asset monitoring and maintenance, wind turbine site evaluations, and supply chain automation, continuously extracting key data will become increasingly important.

This Executive Summary was derived from a recent webinar with hosts Lorena Pelegrin, Digital Product Manager, Iron Mountain, and Roberta Gamble, Partner and Vice President, Frost & Sullivan.

1 Renewable energy includes wind, solar, hydropower, biofuels and geothermal resources.

F R O S T  S U L L I V A N

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