

Big Data, Streaming, and Predictive Analytics in Oil & Gas

Data powers the oil & gas industry

As the oil and gas industry grapples with a period of over supply, lower prices, and sustained uncertainty, they increasingly rely on data and analytics as the key lever to drive operational efficiencies and stay competitive. An average large refinery can generate over **one terabyte of data per day**¹. Data can be a useful asset, but due to the volume, an estimated 99% of the data oil and gas companies generate goes unused. To be successful, oil and gas companies must manage growing volumes of data, collect data from new and diverse data sources, and deliver real-time insights with stream processing and streaming analytics.

Cloudera offers an end-to-end data management and analytics platform that enables oil and gas entities to ingest, process, store, analyze, and model any type of data (structured, unstructured, or semi-structured data), anywhere — at the edge, on premises at the refinery, or in any cloud. Cloudera offers an integrated suite of open-source data management tools and analytics engines that drive insights and action in real time, enabling some of the most compelling use cases for oil and gas companies and driving measurable business impact.

Chesapeake Energy

Downtime as a result of unexpected machine failure can cost tens of thousands of dollars a day in lost production. Chesapeake energy leveraged IoT data from 70 trillion sensor data points and robotic automation system feeds to build a predictive maintenance solution that enabled six years of maintained production and slashed capital costs by 80%.

How Cloudera Enables Oil & Gas Organizations

Today, major upstream, midstream, and refiners around the globe rely on Cloudera to enable data-driven use cases across the oil and gas value chain. Here is a summary of some of the key data-driven use cases in oil and gas:

Exploration	Production	Mid/Downstream	Marketing/Sales
<ul style="list-style-type: none">• Drilling analytics• Reservoir characterization• Real-time drilling operations• Predictive maintenance	<ul style="list-style-type: none">• Predictive maintenance• Wellhead monitoring & control• Reservoir simulation and optimization• Single view of operations and assets	<ul style="list-style-type: none">• Pipeline monitoring & management• Economic output optimization• Predictive maintenance• Supply chain optimization	<ul style="list-style-type: none">• Fleet optimization• Supply chain optimization• Website optimization• Merchandising optimization

What Cloudera Offers the Oil and Gas Industry

Cloudera provides an end-to-end data management and analytics platform that helps the oil and gas ecosystem drive insights and action from any data, anywhere, in real-time.

- **Ingest, process, and analyze** high volumes of real-time data from any source — connected equipment, production sensors, historians, ERP and MES systems, historical archives, master data management databases, fleet vehicles, or worker wearables.
- Enable **predictive analytics** or apply **machine learning algorithms** to petabytes of data while maintaining strict enterprise data security, governance, and compliance, with audit trails across on-premises, cloud, and hybrid environments.
- Gain insights from **unstructured data sources** originating from process sensors, robotics, video streams, or acoustic sensors.
- Build, test, iterate, and deploy **machine learning models** to enable use cases such as real-time equipment monitoring, wellhead monitoring, predictive maintenance, and more.
- Provide **multiple analytical options** to drive insights, intelligence, and action from data at the edge, on premises or in any public, private, or hybrid cloud.

Rowan Companies

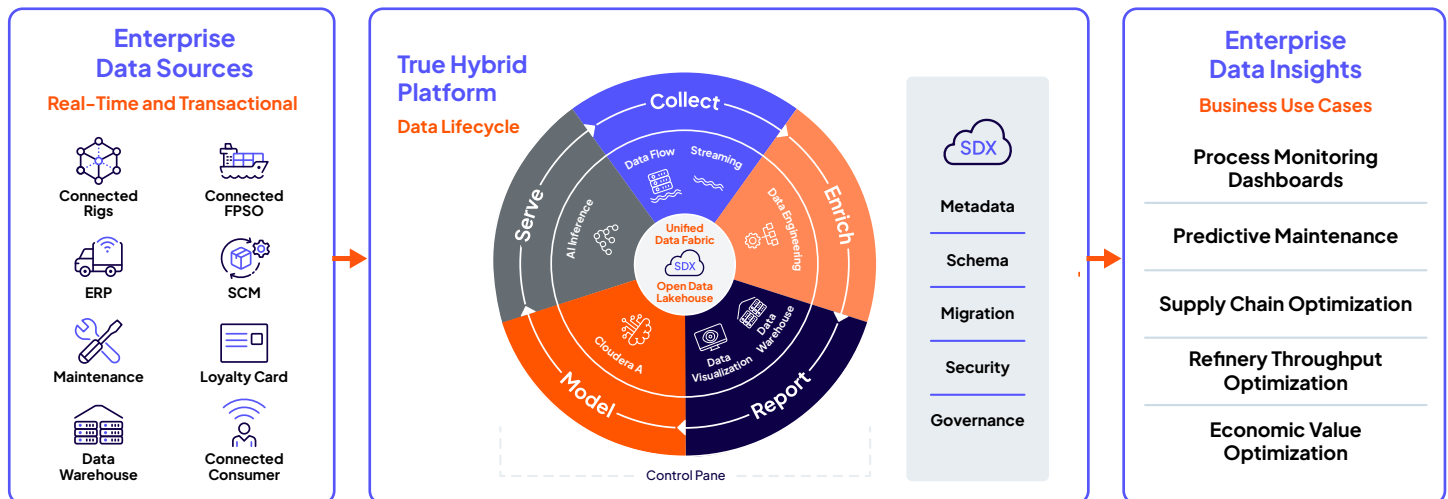
Offshore crews faced challenges due to limited access to real-time data, operating with reduced capacity and relying heavily on remote support. By implementing Cloudera, Rowan established seamless data connectivity, enabling near real-time monitoring and troubleshooting. This solution empowered remote teams to monitor critical conditions with up-to-date, real-time data, significantly improving efficiency and support capabilities.

Open

Cloudera is built on open-source technologies, standards, and processes, supporting your objectives while mitigating the risk of vendor lock-in and accelerating enterprise innovation.

- Open compute enables efficient server, storage, and infrastructure designs for scalable computing
- Open architecture mitigates interoperability concerns
- Open APIs provide access to visualization-agnostic tools
- Open cloud enables a cloud-agnostic approach

Multi-Functional Platform to Drive Outcomes in Oil and Gas



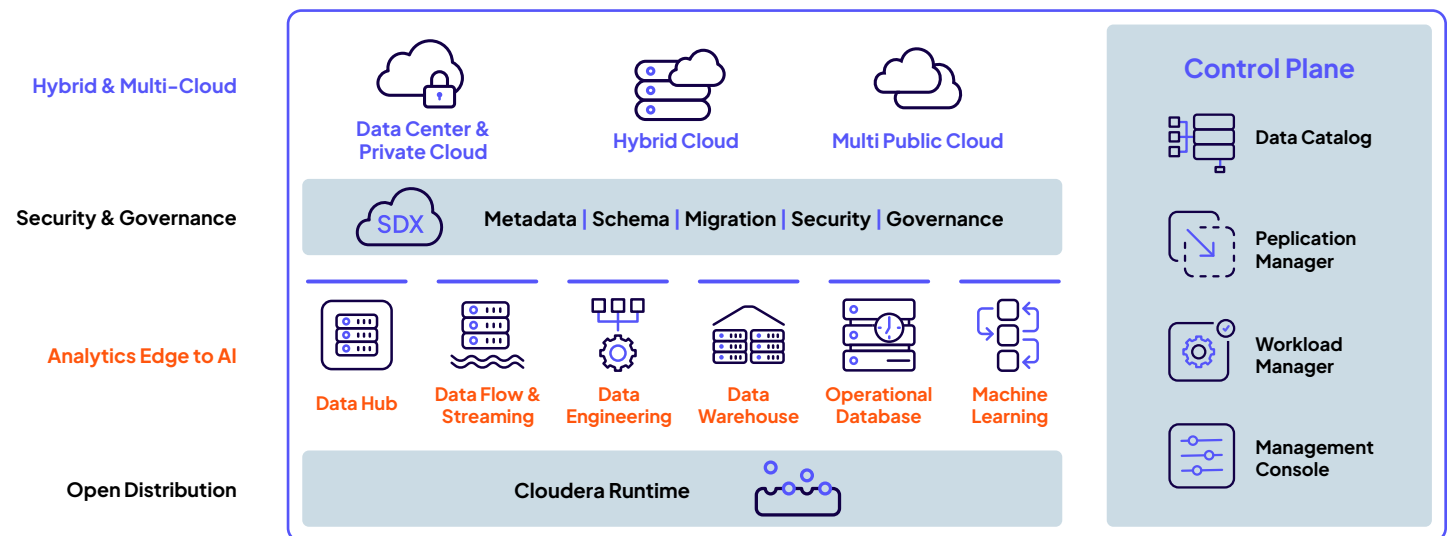
Cloudera

Cloudera is the industry's first enterprise hybrid data cloud, offering a full range of analytic capabilities from the edge to AI. Cloudera delivers powerful self-service analytics across hybrid and multi-cloud environments, Cloudera delivers a powerful platform that can collect, process, manage, analyze, and model any data anywhere to drive actionable, predictive insights. And it's built on open-source technologies, standards, and processes.

Cloudera Shared Data Experience (SDX) provides enterprise-grade security and governance on all data and metadata with dedicated, integrated interfaces to manage it. Data security, governance, and control policies can be set once and enforced consistently everywhere, reducing operational costs and business risks while also enabling complete infrastructure choice and flexibility.

Searcher Seismic

Combing through 20PB of data made audit and discovery nearly impossible. Searcher Seismic created a true hybrid platform offering self-service access to governed data for end-to-end analytics and ML workflows, reducing the need for manual processes to manage data. This change resulted in fewer human errors and made a 3- or 4-person job a 1-person job.



To learn more about how Cloudera drives outcomes for oil and gas organizations, visit <https://www.cloudera.com/solutions/energy-and-utilities.html>.

Sources

¹BehrTech Blog, behrtech.com, "16 Stats about Big Data and IoT in Oil and Gas".

CLOUDERA

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Cloudera is the only true hybrid platform for data, analytics, and AI. With 100x more data under management than other cloud-only vendors, Cloudera empowers global enterprises to transform data of all types, on any public or private cloud, into valuable, trusted insights. Our open data lakehouse delivers scalable and secure data management with portable cloud-native analytics, enabling customers to bring GenAI models to their data while maintaining privacy and ensuring responsible, reliable AI deployments. The world's largest brands in financial services, insurance, media, manufacturing, and government rely on Cloudera to be able to use their data to solve the impossible—today and in the future.

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