OIL & GAS SOLUTION BRIEF

Transforming exploration and production with AWS Machine Learning

In oil and gas exploration, seismic data processing, interpretation, and inversion are highly complex processes in which seismic reflection data helps provide information about subsurface structure, rock formations, and reservoirs. AWS advanced machine learning and HPC tools allow oil and gas companies to reduce the time required for seismic data processing from several months to a few days, creating more accurate 3D models of rock and fluid properties that far surpass traditional methods.

These models (e.g., 3D porosity, permeability, and mechanical properties modeling) can be used in a variety of applications that lead to improved efficiency and speed of exploration, drilling, and production.

54%

54% of oil and gas companies are undergoing digitization efforts *

**2018 CIO Agenda: Oil and Gas Industry Insights*

66%

66% said analytics are transforming their companies*

**2016 Upstream Oil and Gas Digital Trends Survey – Accenture*

10TB

10TB of data is being exceeded per day for a single well*

**2016 Upstream Oil and Gas Digital Trends Survey – Accenture*

Industry trends

There are trends that are driving cloud adoption in the oil and gas industry:

LEGACY TECHNOLOGY

Trapped in outdated legacy technology, oil and gas companies need a low-cost storage option that extracts data, digitizes it, and makes it rapidly accessible.

SECURITY AND COMPLIANCE

There's a strong need for technology that automates compliance programs and improves safety outcomes and operational efficiency.

DIGITAL OILFIELDS

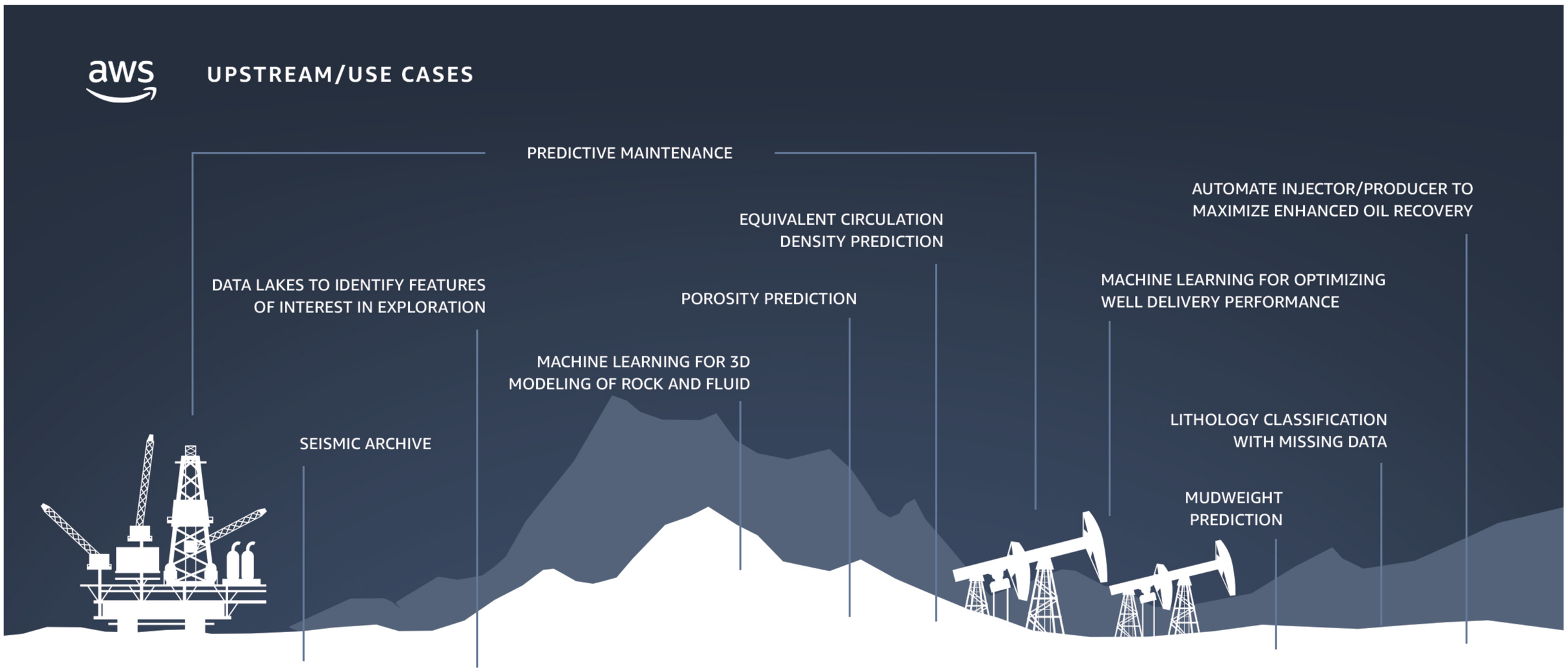
Companies need a better way to manage and monitor their growing assets at scale, to maintain system health, mitigate risk, and improve cost.

OPEN SYSTEMS

Freedom from mega-service companies lets companies innovate quicker, build apps reliably, and work cross-functionally across business disciplines.

Applications of ML in exploration & production

With Amazon machine learning, you can transform exploration in a number of innovative ways, including automating manual analysis and improving data completeness and resolution through prediction. AWS allows you to accelerate exploration in a variety of ways using raw data like well logs, wire line, and other seismic data.



Applications

FORMATION EVALUATION/PETROPHYSICS

- 3D rock property: porosity, density, permeability, prediction
- Lithology classification
- Rock/fluid property prediction in cased holes

SEISMIC INTERPRETATION

- Automated salt body/fault/channel interpretation
- Seismic inversion using ML

DRILLING APPLICATIONS

- Geosteering
- Lithology modeling
- Drilling optimization
- Automatic mud weight adjustment

PRODUCTION OPTIMIZATION

- EOR
- Hydraulic fracturing optimization
- 4D seismic applications

Benefits

- Reduce costs and improve operational efficiency
- Optimize assets utilization and reduce downtime
- Improve safety outcomes and minimize risk for personnel
- Uncover actionable insights more quickly
- Gain better visibility into asset performance
- Optimize production by streamlining or automating workflows
- Improve operational compliance and security

25% of major operators are invested in asset performance management*

**IDC FutureScape: Worldwide Oil and Gas 2018 Predictions*

75% of oil and gas companies have at least one digital transformation initiative in full operation*

**IDC FutureScape: Worldwide Oil and Gas 2018 Predictions*

Conclusion

Machine learning with AWS offers oil and gas companies the ability to reduce inefficiencies while accelerating exploration and reducing costs—driving faster project evaluation and selection and improved profitability.

Explore the full breadth of what AWS has to offer:

AWS Oil and Gas
Cloud computing to enable digital transformation and fuel innovation
aws.amazon.com/oil-and-gas

ML Solutions Lab
A collaboration and education program connecting machine learning experts with AWS customers
aws.amazon.com/ml-solutions-lab

Amazon Machine Learning
Machine learning services and tools tailored to meet your needs and level of expertise
aws.amazon.com/machine-learning

Amazon Sagemaker
Build, train, and deploy machine learning models at scale
aws.amazon.com/sagemaker