› Solution Brief

Business Impact

"Unconventional [exploration] has brought new resources into play in new locations of the world. This requires the organization to build optionality into contracts and build mechanisms to reduce risk."

IDC Energy Insights 2014 Predictions: Worldwide Oil & Gas
December 2013

Challenges

- **Data quality/quantity.** Engineers use specialized tools with specific data formats that require complex data pre-processing. As a result, critical data is often not used.
- **Inconsistent historical insight.** Each well is different, so history matching without proper analysis often fails to produce reliable predictions.
- **Lack of consensus.** It's hard to determine how different parameters will affect well performance, so selecting optimal fracturing and completions techniques is difficult and well performance is unreliable.
- **Costly resource exploitation.** Managers often don't understand critical performance parameters and can't calibrate likelihood of recovery, determine economic feasibility or develop best practices.
- **No centralized model library.** Critical insights are isolated, and it's difficult to share economic and stimulation models.

Optimize Your Unconventional Exploration and Development Strategies to Maximize Production

The Issue

Over the past decade, significant natural gas supplies have been discovered in shale. While new technologies have driven down the cost of gas extraction, pursuing natural gas in shale continues to be risky and capital-intensive. The techniques used to extract oil and gas resources from unconventional geological formations – like oil sands, oil shale, coal seam gas and shale gas – are evolving with new technologies at an incredibly fast rate. It's a time of great learning, where trusted drilling methods must advance while also helping to minimize costs and maximize performance.

To model, simulate and predict well productivity, operators must use integrated exploratory, predictive and forecasting capabilities underpinned by advanced analytical models. Only then can they unlock the true potential of each wellbore. Without the critical insight that comes from pairing productivity analysis with economic feasibility, companies face significant risk and uncertainty when developing new wells or optimizing production of extant wellbores.

The SAS Approach

Extraction and production techniques for unconventional resources require combinations of analytical processes that operators don't always use effectively to maximize returns and reduce costs. We approach the problem by providing software and services to help you:

- **Make faster, more accurate decisions about extraction techniques.** Aggregate data from various sources for near-real-time analysis and collect it in a data store for further analysis by senior decision makers.
- **Identify parameters with the most significant statistical impacts.** Identify key production indicator variables and their range of values; automate data normalization and remediation for missing and erroneous values; and identify objective functions.
- **Increase collaboration among teams specialized in unconventional resource extraction.** Automatically route alerts to subject-matter experts, receive work items from multiple monitoring systems and store the information for future use.
- **Take appropriate action to maximize field production.** Compare real-time production data rates and type curves against forecasted trends; segment fields via well profile clustering; and increase confidence within defined intervals of expectation.
- **Comply with evolving regulatory regimes.** Aggregate data and create business rules according to reporting requirements.

SAS® solutions provide data-driven analysis of unconventional resource exploration, development and production – reducing costs and delivering higher productivity.

sas
THE POWER TO KNOW®

The SAS® Difference: Integrated, collaborative approach to well data modeling

SAS helps you optimize unconventional resource exploration by providing a flexible data management architecture and analytics solution. With SAS, you get:

- **Superior data integration techniques.** SAS transforms multiple, siloed data sources into a unified body of knowledge that is continually updated, validated, prepared for analysis and managed for integrity.
- **Collaborative tools for key stakeholders.** This enables key team members to view and understand important analyses about key characteristics that are critical to well placement, selection of stimulation strategies and well performance.
- **Advanced predictive analytics.** SAS improves your understanding of the correlation between well performance and geology, reservoir, rock mechanics, frac-pack process and proppant fluid so you can clearly classify clusters of best possible wells for a given geology and reservoir condition.
- **A single framework for best practices.** This allows for centralized and secure storage of best-practice economic and drilling models, enables all participants in the decision process to collaborate on strategies and performance, and lets you develop a cycle of continuous improvement of analytical and decision-making assets.

Case Study: A large, offshore oil and gas company

Situation

- Executives needed a reliable approach to select drilling sites, determine stimulation and completion techniques, and predict production. Engineers had multiple tools and data sources, but they were not used to their fullest extent. The history of fracturing techniques and proppants was too short to allow for certainty – and history matching and simulation did not yield truly predictable well performance.

Solution

- After analyzing the company's needs, SAS provided a solution that integrates data collection and preparation from all systems into a single environment. The solution uncovers hidden relationships, clusters and characteristics that are predictive of well performance. It also provides predictive models for making more accurate decisions about well placement and fracturing techniques. And it creates an environment for continuous improvement and sharing of well models.

Result

- All users work with the same data, enabling more focused management.
- Decisions are made faster and with more accuracy.
- Production targets are reached with fewer wells and at lower costs.

What if you could …

Increase collaboration

What if you could strengthen collaboration among SMEs to improve oil and gas extraction from unconventional fields?

Automate reporting

What if you could automate reporting for all the different regulatory regimes?

Integrate siloed data sets

What if you could aggregate data sets from across geoscientific silos to produce a tailored, robust data set?

Identify wells to remediate

What if you could compare current production to future trends to confidently make remediation decisions?

You can. SAS gives you THE POWER TO KNOW®

SAS Facts

- SAS has been in business since 1976 and today has customers at more than 65,000 sites worldwide.
- SAS works with 90 oil and gas customers in 27 countries.
- SAS is a leader in "The Forrester Wave™: Big Data Predictive Analytics Solutions Q1 2013" http://bit.ly/1FSAS.

Learn more about SAS software and services for the oil and gas industry: sas.com/oilgas

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