

On the Edge of Your Seat

Unlocking Value in Upstream Data



Think about the excitement you feel when you're about to reach a major milestone – cross a finish line or “strike gold.” Or what about the elation when you discover a new insight – that “aha” moment?

Now, imagine reaching those milestones and aha moments a lot more often. You can. Because of near-real-time intelligence gathered from all your data – not just subsets or samples.

Oil and gas companies are getting there with the world of upstream data, by encouraging information sharing across silos. As a result, engineers are free to explore, interrogate and analyze the data like never before. Some early data-driven wins in the areas of unconventional resources and asset health analytics have sparked anticipation of even more success to follow.

Unlocking the Potential

While there's a lot of talk about developing a data-driven organization, there's also a lot of uncertainty about how to actually do it. That's where data – and analytic – visualization come in.

Simply put, data visualization is a way of letting you see data graphically within a business context so you can understand it better. The right data visualization solution can make it easier for you to spot previously hidden patterns and trends and identify opportunities to analyze more deeply.

Analytic visualization takes it a step further by performing sophisticated analyses very quickly, even instantaneously. Then it presents results that help analysts and engineers at all organizational levels draw

insights for drilling and completions optimization, asset integrity, redevelopment strategies, or health, safety and environmental compliance.

Getting It Right

Upstream engineers understand the high stakes involved with quickly building data-driven models that solve business problems. Yet the early stages of data gathering for an analytical project often consume most of the time allotted to the entire project – leaving little time for focused analysis and refinement. Why?

The answer relates to the uncertain and iterative nature of many tasks in the analytical life cycle. For example:

- Many data sources have unknown or hidden value.
- The available data often does not support the analysis.
- The data may be too large to explore patterns holistically.
- Data extraction requirements are often based on intuition, not facts.

In addition, managers tend to downplay the importance of precisely identifying the business problem in the first place. And they may assume that the data on hand is the right data to solve the problem.

With SAS® Visual Analytics, you can do it right from the start. This solution helps you formulate the business problem correctly and comprehensively then identify the relevant data for building good analytic models. And you can do it all faster than ever before, with potentially great results for your business.

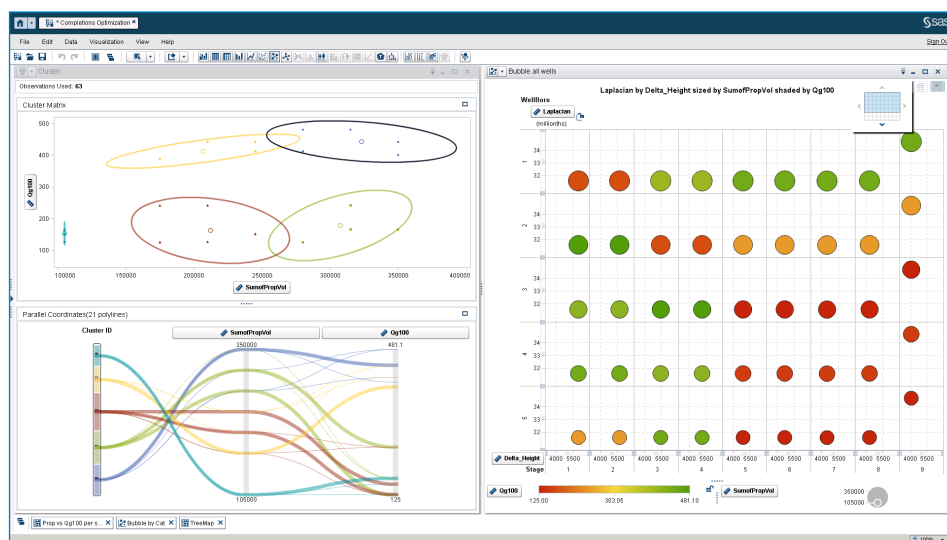


Once engineers confirm that they have the appropriate data, the next task is to address the problem's analytical nature. Depending on the situation, they may choose to explore the data using segmentation, predictive models or forecasts. While each approach requires different data elements, the self-service data exploration in SAS Visual Analytics means less reliance on IT – and significantly better efficiency throughout the analytics life cycle.

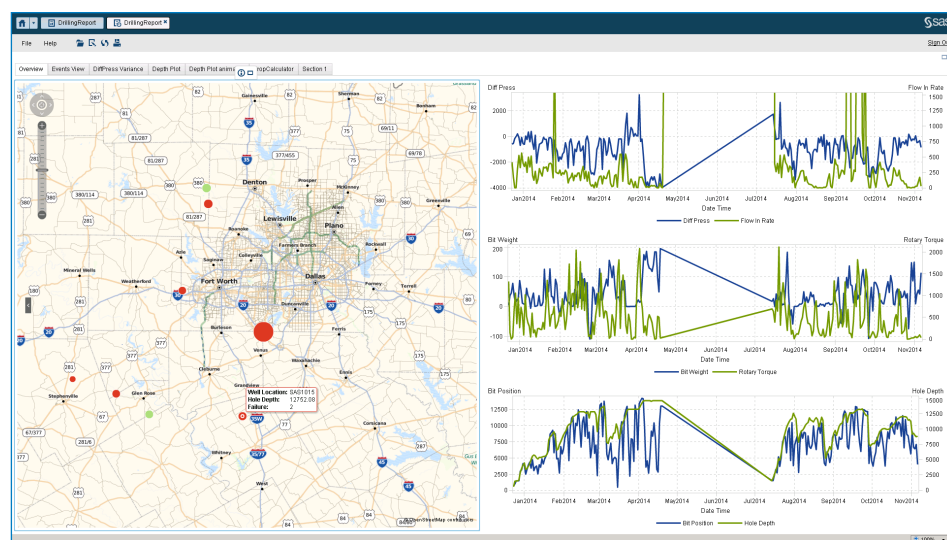
Visual Analytics in Upstream Oil and Gas

Once data is ready for analysis, engineers can take full advantage of the speed of in-memory analytics and the capabilities of integrated forecasting, geospatial visualization and correlations. Consider a few examples of how to apply visual analytics across the upstream value chain.

The challenge is that seismic and production data sets are swamping traditional IT systems.



Easily compare production characteristics, such as proppant values and flow rates, in an interactive, dynamic interface



Gather and analyze drilling insights across a geographic heirarchy.

The Exploratory Stage

Characterizing the reservoir of a mature field requires analyzing large data sets gathered from well tests, production history and core analysis results. This should be enhanced by high-resolution mapping of seismic attributes to reservoir properties. With enhanced data visualization, you can rely on spatial analysis, simulation and uncertainty quantification of the reservoir to strengthen financial analyses and field development efforts.

SAS Visual Analytics lets you make timely assessments of geological and operational parameters to deepen your understanding of oil and gas assets. And because parameters that have the most influence on production, it can guide future exploration plans, too.

The Development Stage

To drill wells safely and efficiently, you need performance metrics that can improve well control and reduce lost time. To do this, you must have access to trusted data at the right time and in the right place. Some operators have accomplished this by using a centralized data environment. But this approach has its own share of challenges.

Using SAS® Data Management solutions, you can aggregate key drilling and completion data across various sources – surface data, logs, and operational and safety data. Trustworthy data paves the way for using more advanced analytic capabilities to improve planning, execution, analysis (post-well) and knowledge management. Data mining and advanced analytics techniques aid drilling engineers in analyzing bottom-hole assembly (BHA) and rig performance. Completion engineers can uncover more efficient and effective practices – depending on the play. Improved completion practices yield measurable economic advantages by identifying correlation across fracture and production-enhancement parameters.

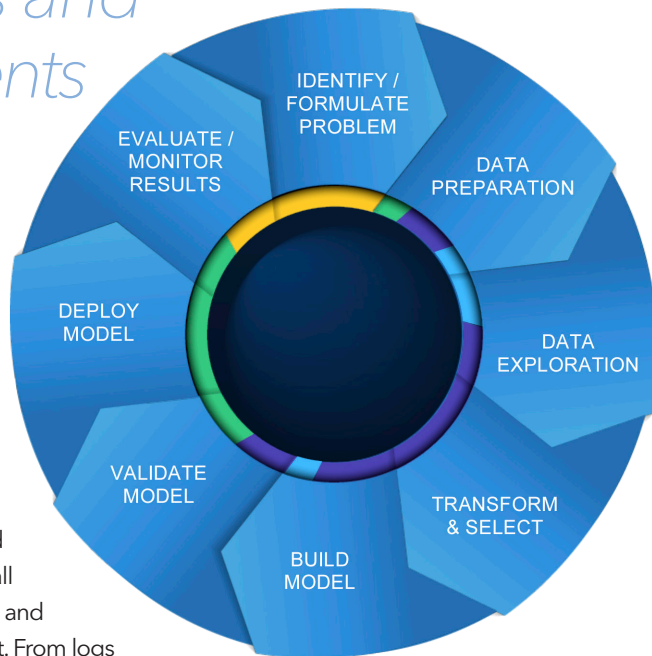
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SAS Visual Analytics gathers and analyzes all relevant data – and all types of data – related to drilling and completion of an oil or gas asset. From logs to PVT data, SAS solutions deliver new insights about subsurface complexity. In turn, you can select the most appropriate drilling and completion strategy, developing the asset within the parameters of your budget and plan.

The Production and Enhancement Stages

With SAS Visual Analytics, it's easier to achieve production targets. The solution lets you cluster wells by production, determine key performance indicators, and incorporate known geology and reservoir conditions so you can identify the most promising opportunities.

SAS illuminates chances to further develop a resource through enhanced oil recovery (EOR) techniques. Because it considers all available data sets, including 4D seismic data, SAS characterizes the reservoir's seismic attributes in a way that identifies lagged oil, indicates ideal placement for new production or injector wells, and judges the effectiveness of current development strategies.



Predicting the Unpredictable - Asset Integrity

With SAS Visual Analytics, you get a 360-degree view of asset performance regardless of your location or asset management system. By anticipating production disruptions – or eliminating them before they happen – you can make the most of your maintenance resources and keep production on schedule and within budget.

Not All Data Visualization Solutions Are Created Equal

All the data visualization solutions available today have a lot in common – a nice user interface, quick generation of standard and ad hoc reports, and more.

But all solutions are not created equal. The difference is in the analytics.

SAS Visual Analytics is the only solution that provides more than just basic data visualization capabilities in a single offering. It

includes analytic visualization based on predictive and descriptive analytics, as well as reporting and mobile capabilities.

You don't have to be a rocket scientist – or even a data scientist – to use SAS Visual Analytics. With its intuitive interface, even managers with limited technical backgrounds can ask – and answer – unanticipated questions. They can do it using comparative visual analysis, on-the-fly calculations and correlations, and ad hoc queries. And they can do it all without burdening IT. Which brings us back to the thrill of the aha moment, and the promise of many more to come!

For More information

For more information and to test drive SAS® Visual Analytics, visit sas.com/va

Read more at: sas.com/oilgas

Explore the latest buzz on business analytics at the Business Analytics Knowledge Exchange: sas.com/bake

For premium content and collaboration with experts and peers: AllAnalytics.com

To contact your local SAS office, please visit: sas.com/offices

