

# Realizing the Benefits of Analysis and Prediction in the Drilling Domain

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Never before in the history of the Oil and Gas industry have we had as much information as we do today. Pre-drilling models, real-time data feeds from sensors, active intelligent systems and monitoring processes. The constant flow of information is intended to help us reduce cost, operate more efficiently and drill safely to the limits allowed by science. How can we harness the power of information and technologies and bend it to our advantage?

How do we leverage this information along with the potential of our computing capacity?

## Operating an “intelligent” automobile



Let's begin by thinking about an analogy most of us can relate to – driving a car. Consider a car with basic information such as a speedometer, an RPM gauge and a few basic warning indicators in the event of a catastrophic engine problem. We would be equipped with everything we need to get to our destination. However, are there other things we would LIKE our car to be able to do to help us to be more safe and efficient such as:

- Could we have active traffic monitoring?
- Could it notify us of points of interest along the way?
- Could it help us drive more efficiently to save fuel?
- Could it tell us about the weather?

## Prediction as the value of information

In our situation above, we quickly realize there is more benefit in having the car perform basic functions for us so we can focus on more important things.

Similarly, we need our engineers to concentrate on value-added tasks rather than the routine. Just as in our analogy, a driver using a simple car doesn't have as many opportunities to leverage the power of the computer to enhance his or her driving activities.

In drilling, the monitoring of real-time data has become routine. We need to use intelligent technologies, software and computing power to allow our engineers to focus on optimizing our drilling opportunities, letting the computer systems handle the rote. The key parts of improving any drilling process are having pre-drill models, information about the environment and geology, and a forecast that looks ahead.

Our ability to predict has been evolving and continues to improve. With the wealth of data we now have, this dream is on the verge of being a reality. We are happy to see that SPE has a renewed focus on this with the creation of the SPE Drilling Uncertainty Prediction Technical Section (DUPTS) whose mandate is to focus on drilling ahead of the bit. What role can you play in the vision of predicting ahead of the bit?

## **Analytics – the intelligent use of information**

Calculating the optimum route when driving a car requires us to think about all possible paths as well as traffic, weather and car performance. In order to effectively predict, we need to follow a similar path. The analysis of the combined data in the forms of real-time, mathematical models, historic data and engineering expertise, will provide the route to drill effectively and safely in the future. This process

requires high-quality data, highly-efficient access to the data, intelligent design to incorporate information into the user interfaces, and knowledge. This is then driven by experience and science in the form of formulas and routines.



Analysis of information can take many forms. One is visual analysis. When we setup displays showing log plots, geosteering correlation and real-time monitoring consoles, it allows the user to see integrated information in ways that he or she will (hopefully) be able to quickly assimilate. This enables them to move on to the important task of decision making.

Analytical interpretation is another more complex process of analysis. It offers the promise of automating the routine, clarifying the ambiguous and highlighting the obscure. We've mentioned the desire to predict ahead of the bit. This will only be achieved when we couple together the power of the technology available to us with the knowledge and experience of science and then feed it with the data and information required to derive the answers. And, when done right, the limits are endless.