1990 Post Oak Blvd,
Space 1990 D
Houston, TX 77056
1-(866) 997-3453

Honed Machine Learning Execution

We are at a step change in the oil & gas industry

Living in the information age, we are exposed to more information in one day than most other generations have been exposed to in one year. It's reached a tipping point where too much data is causing a strain on our ability to process this information at a rate humanly possible. Our response has been to reduce this data flow and to limit the intake to what we determine is usable and important. Modern computing is better able to assist us with this information overload. For example, machine learning algorithms filter for spam in our inbox. Furthermore, we are training computers to perform even more complex, higher level tasks to collect and filter information for automated recommendations and decisions. With this evolving and advancing technology there are countless applications. Sfile is pioneering the extraction of knowledge from historical and real-time well files to yield higher quality decisions leading to the ultimate outcome: higher and more economical production from oil & gas resources.

What it takes to maximize production

Break away from reality: how would a perfect well get produced? The best location for the well is selected, one that is well researched and found to have the best geological mix. When planning the well, every department has their best experts digging into the data to ensure the process runs as flawless as possible. Because of the heightened focus on this well, all departments communicate effectively and inform everyone of any changes made in the process. No one wants to be blamed for causing things to go awry, so everyone stays heavily involved with every step of the process. All this time and energy results in exceptional production. It took a lot of resources to make everything run smoothly for this well. While this is possible for a small handful of wells, it is not sustainable for an active drilling schedule.

How a typical well is made

Now back to reality: A well is planned with a location in mind, but lease restrictions may rule out the best spots for the well. Time and cost constraints affect the choices from the start. The

zones of interest don't come in as expected, but everyone is bogged down with things to do. With a burn rate of about $5k per hour, they don't want to halt production to call town and contact the geologist. Every time they get lost in section and have to shut down, it takes at least 3-4 hours away from production, so about $20k. If the geologist want to consult other departments, then it can take even longer. With the pressure to keep production going, quick decisions are made with less than optimal data. No one has time to go back and re-evaluate actual vs planned execution and re-interpret the new reality of the well. This delivers a less than optimal well, providing only 70% to 80% of the possible production. We say that extra 20-30% comes at a higher cost than the price justifies, but since the full potential will never be seen, we can't evaluate that claim. Fields frequently get reentered to extract more oil, but a good portion of this could have been extracted the first time with better execution.

How can we improve execution?

The method for data collection and assessment needs to be faster than humans can perform. Introducing machine learning to processing allows for a heavy load of data collection and data assessment to be automated. Modern computing has the power to perform these in a fraction of the time required by a human. Without the burden of data collection and assessment, we are now able to focus our time and energy on more critical tasks of E&P that require intuition. Machines will provide a recipe of the ingredients that will give the best results for the well based on the location's geographical and geological makeup. With real-time updates to how the well is responding, computers are able to continually adjust the recipe for optimal output. Stage-by-stage completion parameters are monitored, and if the rock is not responding as expected, the computer can recommend further changes.

Results

Computers give instant feedback on how the well is reacting to the methodology being used. Currently it is not possible to involve all departments across the entire enterprise on every decision, but with computers collecting and providing details, this changes. Information can be broadcasted across the enterprise instantaneously, allowing every group to stay informed and perform at their peak potential. Instead of spending a large portion of their time collecting data, human operators are now free to do the creative work of analyzing real data at decision points. Being able to look at live and past data provides new insights that are too time consuming to

get to with current practices. This is the oil company of the future; we are leading companies into the digital age of oil extraction.