Turning Oil and Gas Data Into Performance

Big data is not new to Oil and Gas. After all, it has relied on seismic analysis to control uncertainty in oil exploration for many decades now. But for most other facets of oil-well management, Oil and Gas companies have relied on human skill and judgement with data playing a relatively insignificant role. All that's changing today with the advent of era of cloud computing and modern Big Data technologies. Here're the key ways we're helping turning oil and gas data into gold.

Knowledge Discovery

Unstructured data related to oil wells is accumulating in data silos in Oil and Gas companies for decades. The data comes from different stages of a oil well life cycle and in different forms - scanned images, PDF, DLIS/LAS files, XML files and so on, sourced internally or from OEMs or through mergers and acquisitions in the years past.

Austin Labs provides data science solutions to ingest such data, understand the hidden semantics and make the knowledge trapped inside it structured so that your engineers can search it as easily as you search the web today.

Our unique technology allows combining machine-learning with SME knowledge to translate unstructured data into useful knowledge in a trustworthy fashion.

USE CASES AND BENEFITS

- Cluster what's lurking in your data lakes into truly separate categories
- Create standard representation of data for each category
- Create virtual well folders
  Search for wells with specific location and geological, geophysical and performance attributes.

- Rapidly build apps on SciCloud for engineers and physicists

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Well Performance Modeling

Oil and Gas companies have traditionally relied on physics-based models to predict decline curves and other performance metrics of oil well or reservoirs. However, it was always understood that far too many variables affect a well performance in reality. Evidence-based prediction of well performance is now becoming possible as companies have accumulated data on millions of wells over a wide-variety of geographies and life-cycles.

Austin Labs uses unique technology to supplant physics and SME knowledge-based performance models to improve their accuracy in significant ways. The technology combines the specific geophysics of a well with the similarities with past wells to predict and update decline curves, probability of catastrophic collapse and other such performance metrics.

Our solution uses ensemble of data science techniques to reduce bias in forecasts and constantly learns from incoming data.

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- Improve the accuracy of decline curves with the help of knowledge about past wells
- Gain knowledge of upcoming declines sooner than before
- Reduce chances of catastrophic collapse through proactive modeling
- Optimize production practices to minimize chances of catastrophic collapse

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Pump Prognostics and Health Management

Pumps play a key role in smooth operations of wells. An unexpected pump failure can stop production for untenably long durations causing financial losses and sometimes risk to the safety of the operators. Companies keep a stock of replacement pump to minimize such risks and also follow a rather conservative preventive maintenance schedule, both resulting in additional costs.

Big Data has made a more proactive (or prognostic) approach to maintain pumps possible. Modern pumps often capture vibration, temperature and pressure data from it's key sub-components. Largely it's used by the operators to monitor it's health.

Austin Labs PHM solution learns from historical data from hundreds of pumps and creates a model to

predict a running pump's remaining useful life as a function of how the pump was operated. Such a model goes beyond the manufacturer's recommendations and adjusts both for the peculiarities and defects of a particular pump and how heavily it was used.

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- Predict a pump's remaining useful life taking into it's specific history into account
- Reduce the probability of catastrophic failures
- Extend pumps life on average with confidence
- Reduce replacement inventory carrying cost