Big Data in Oil and Gas Industry

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1 Introduction

Big Data or Big Data analytics refers to a new technology which can be employed to handle large datasets which include six main characteristics of volume, variety, velocity, veracity, value, and complexity.

With the recent advent of data recording sensors in exploration, drilling and production operations, oil and gas industry has become a massive data intensive industry.

Analyzing seismic and micro-seismic data, improving reservoir characterization and simulation, reducing drilling time and increasing drilling safety, optimization of the performance of production pumps, improved petrochemical asset management, improved shipping and transportation, and improved occupational safety are among some of the applications of Big Data in oil and gas industry.

In fact, there are ample opportunities for oil and gas companies to use Big Data to get more oil and gas out of hydrocarbon reservoirs, reduce capital and operational expenses, increase the speed and accuracy of investment decisions, and improve health and safety while mitigating environmental risks.



Figure 1 Big Data in Oil and Gas Exploration and Production

One of the key enablers of the data-science-driven technologies for the industry is its ability to convert Big Data into “smart” data. New technologies such as deep learning, cognitive computing, and augmented and virtual reality in general provide a set of tools and techniques to integrate various types of data, quantify uncertainties, identify hidden patterns, and extract useful information enormously reducing the data processing time. This information is used to predict future trends, foresee behaviors, and answer questions which are often difficult or even impossible to answer through conventional models.

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