The Impact of Data Analytics on the New Digital Oilfield - eLearning Course

COURSE

About the Course

Many, if not most, operators and oilfield service companies are embracing the strategy of digital transformation. This course doesn't begin at the beginning but is an examination of the progress, successes, and challenges the industry is facing.

See online learning demo

Target Audience

Engineers, geoscientists and data analysts who want to and need to understand how this field is evolving.

You Will Learn

- How "digital" helps the industry cope with the headwinds of economic (lower prices) and greater regulatory expectations. Can "digital" help the industry create a niche in a "green" new order?
- How the industry is faring in adopting new "digital" technologies and more efficient ways of doing business. Are we finally overcoming the challenges of a poor data foundation and resistance from an old-school organizational culture?
- The impact the new generation of workers will have in digitally transforming the business and the technologies and business changes they will want to implement. Are the best and brightest next generation talent attracted to the oil patch these days?
- How the industry is doing in shaking off its image of slow adopters and "digital laggards" from the tech community. Have we finally broken out from a long list of pilots and reached enterprise scale?
- How the industry is finding value from "digital" investments. Can we tell a good "digital" story to our investors, CFO, supply chain partners and show them a return on our projects? Is the story in dollars, not just barrels?

Course Content

Introduction to the Digital Oilfield

We will start by introducing the Digital Oilfield, what it is, how it developed and what the future of digital technology and data analytics in the oilfield might bring. The Digital Oilfield is a reality, but it is taking on new forms shaped by emerging digital technologies, improved data visualization and advanced analytics techniques.

You will learn:

- Physics, statistics and explainable AI
- Digital oilfield 2.0 (what's different this time)
- What's the big deal about big data and data science

Operational Technology and Field Networks

Once just industry buzzwords, automation and digitalization stand to save upstream operators $100 billion in the 2020s, according to a study by energy research firm Rystad Energy. Their analysis notes that in 2018, $1 trillion was spent on operational expenditures (OPEX), wells, facilities and subsea capital expenditures (CAPEX) across more than 3,000 companies in the upstream sector. Automation and digitalization could trim 10 percent of this spend from the budgets of offshore, shale and conventional onshore operations. Rystad indicated that many operators expect automation and digitalization to reduce drilling costs by 10 to 20 percent, and facility and subsea costs by 10 to 30 percent. However, adoption across the entire value chain of suppliers will vary, leaving realistic efficiencies and synergies at closer to 10 percent by the end of the next decade. Upstream operators and service providers have latched on automation and digitalization as a means of efficiency, especially after the industry's most recent downturn. For some, it was 'adapt or bust.' The Internet of Things has allowed for even more data to be digested efficiently. Still, given the complexity of digitization efforts – oil and gas companies have been estimated to use just one percent of their data.

The ability to holistically optimize the whole business is a key benefit of the convergence of OT and IT: the idea of "reductionism" that has previously governed any talk of automation suggests that any complete system can be reduced and understood by dividing the entire asset into its individual components. As petroleum engineers, this is a neat and tidy way of thinking, but not an accurate one, because often the valuation and optimization of an asset is much more complex with each component of the larger whole being interdependent on each other both internally and externally to the system. Converging OT and IT allows for an increased ability to optimize systems and assets that are interdependent on many components and can help understand and manage interactions between the components.

You will learn how to:

- Explain what the drivers for the convergence of OT and IT are
- Describe a sensor platform
- Explain how humans can interact with the emerging digital field environment
- Recognize the use of sensors in the oilfield
- Describe the concept of 'digital twins'
- Describe the use of the control system, Supervisory control, and data acquisition (SCADA), in the oilfield
- Describe how enterprise architecture provides a blueprint for an effective IT strategy
- Recognize the importance of Internet of things (IoT) devices to connect and exchange data with other devices and systems
- Explain the concept of 'systems of systems'

Digital Oilfield Challenges, Barriers to Adoption, and Risks

In this skill module, we cover the enabling technology and IT infrastructure aspects of the digital oilfield through an understanding of the history of how the digital oilfield evolved (five stages of digitization), the importance of a good data foundation, challenges in the adoption of digital solutions, and the threat from cybersecurity malware.

You will learn:

- Five stages of digitization of the oilfield
- Challenge to adoption and lessons learned
- Physical and cybersecurity challenges

Data Foundation for the Digital Oilfield

Data is an often neglected aspect of Petroleum Data Analytics projects. We are excited to get started building a predictive model given the new artificial intelligence/ machine learning techniques but if we rush over the data profiling steps, not understanding the possible inherent bias of our data sets, we can create very sophisticated but not very useful models. Remember the old adage "garbage-on, garbage-out." Effective data visualization techniques can help us tell an important story with the data and highlight new insights into operational systems. But on the other hand poor data visualization methods can allow an unsuspecting analysts to "lie with data."

You will learn:

- Current data management practices, silos, clouds and lakes
- The truth about drilling and field sensors
- Data visualization and communications challenges (data storytelling)

The Future of the Digital Oilfield

There will be many factors that will influence the future of oil and gas operations, including technology trends, economics, market forces and demand for oil and gas products. What will the future digital oilfield look like? What will be the role of the future petroleum engineer? There are not right or wrong answers to this question and many factors that today are uncertain. But the best way to predict the future is to invent it.

You will learn:

- Emerging trends in digital technology
- Integrated operations and minimally manned facilities
- The role of digital twins and artificial intelligence (AI), automation and autonomy

Product Details

Categories: Upstream

Disciplines: Data Management, Science and Analytics

Levels:

Product Type: Course

Formats Available: On-Demand

Instructors:

On-Demand Format

|	Course |	On-Demand (Available Immediately)	$1,800.00