

## TECHNOLOGY

# A new roadmap for E&P optimisation

**Ashok Bilani, Executive VP of Technology, Schlumberger, will be speaking about future digital technology trends at IP Week on 20–22 February 2018.**

*What are the key new E&P technologies to help unlock future resources?*

The oil and gas sector today has no shortage of resources which can be developed and produced to fulfil the forecast demand. The key question is what resources can be produced to yield sufficient financial returns in the current low price environment?

We can focus this discussion on the promise of new digital technologies, and the capabilities of system optimisation through automation of the new technologies to help to achieve this goal. These new technologies originate from high tech software companies in the Silicon Valley, and can help innovate practically all the workflows of the oil and gas industry to establish new levels of productivity and performance.

By leveraging digital technologies including analytics and machine learning, high performance computing (HPC) and the Internet of Things (IoT), we can improve operational efficiency and deliver optimised production at lower cost per barrel. Digital technologies can expand our ability to capture, process and analyse the growing volume of data produced by E&P operations, and turn this data into knowledge and improved technical and financial performance. New solutions are emerging that connect domains, people and processes through a new digital foundation, and offer a new way of working that provides unmatched performance and a step-change in efficiency.

*What areas of innovation can help reduce E&P costs?*

For the purpose of addressing full cycle costs for oil and gas, the upstream process can be divided into three segments: (i) characterising a resource as an



asset, (ii) drilling and developing the asset and (iii) the management of the asset during production.

All these domains of activity during the lifecycle of an asset can be made significantly more efficient in terms of cost and time by using a digital strategy. A secure and open digital framework can provide data ingestion and access, scalability, cognitive, collaborative capability and agility in the innovation process.

This environment can provide a new and more collaborative way of working for asset teams by strengthening integration between geophysics, geology, reservoir engineering, drilling and production domains. The digital framework can deploy powerful software, built on deep science to automate and accelerate complex functions such as modelling, simulation, analysis and forecasting. As new products and applications for these domains are built within this framework, the costs of characterising, developing and producing assets will be reduced progressively.

*What areas of innovation are on the horizon in terms of R&D?*

Once all available data has been ingested into the digital framework and applications have been developed to leverage the required attributes, future innovation will come from the application of learning networks from the world of artificial intelligence (AI) and advances in

control systems, moving us further on the roadmap of automation. Innovation will reduce cost and increase performance significantly.

By embedding electronics, sensors and actuators into smart networks, data can be rapidly exchanged between physical devices, equipment, transport, etc. This creates opportunities for integration of the physical and digital worlds, resulting in improved efficiency, repeatability and less human intervention. Recent advances in cloud-based high performance computing (HPC) enable supercomputing-on-demand to deliver the right information and actionable insights at the right time and help users to run their workflows faster and seamlessly. In addition, accelerated computing allows users to run multiple scenarios for optimising performance and minimising project risk.

*How can the oil and gas sector address the increasing need for low carbon technologies?*

The oil and gas sector can contribute to the reduction of the carbon footprint in two ways. Firstly, we can reduce the carbon footprint of oilfield operations, mainly in drilling and production. This is being done with an array of products, by introducing better and more efficient processes and using fewer resources. Secondly, a key area of focus for larger oil companies is to improve the emissions efficiency of the internal combustion engine, by improving fuel quality and composition, and working on the combustion process to reduce overall carbon emissions into the atmosphere. This will be a significant contributor to lower the carbon footprint in future economies, possibly more than what will be achieved by switching to electric vehicles.

The development of low carbon technologies that optimise oil and gas production while at the same time consuming fewer resources such as water and electricity, will have a significant positive impact on the environment. These new low carbon technologies will require collaboration from all stakeholders. This will open numerous opportunities for E&P companies and oilfield services providers to collaborate with universities and research institutions, governments and consumers. ●