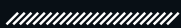




# Digitalisation is enabling the energy sector to move forward



**Dany Rahal**, Head of Product Management, DELFI, Digital & Integration Division, Schlumberger spoke exclusively to Julian Walker about the importance of digitalisation and leveraging the company's deep digital expertise

## How is greater digitalisation in the oil and gas industry creating risks and opportunities?

Before I address some of the risks we see as a consequence of digitalisation, I think it is important to highlight the reduction of risks due to digital transformation.

For example, oil and gas remote operations enabled by automation and digital solutions are reducing the number of people required to work in the field and on the rig; many subject matter experts can now complete their daily tasks from the safety of the office. We have been transitioning to these new ways of working for some time, and the progress has been greatly accelerated to help ensure business continuity for customers during COVID-19 restrictions, allowing high numbers of field and rig operatives the freedom to work from home.

It's worth noting that our normally office-based staff are also now working from the safety of their homes, so these new deployments were accelerated via remote working teams using digital solutions.

The drive to remote operations is supported by the growth in sophistication of edge computing, which means much of the equipment can monitor itself. Today, hazardous and time-consuming tasks which involve sending people to the field to check equipment are unnecessary. Data streams directly from the equipment to alert operators of issues and potential failures and in many cases the corrective action is carried out remotely or via automation. It's another example of how digitalisation is increasing our ability to put safety first.

So, if we're talking about risks from digitalisation, to see the full picture we must see the reduction in risks these new solutions have achieved.

Remote working and equipment monitoring are both examples of how digitalisation in oil and gas is changing working lives, and that is where the most profound risk presents itself. We must be prepared with clear and well-defined strategies for managing change. Some organizations adopt a digital transformation approach because they feel they must, without a strategic transition framework that puts all the required elements of support the customer needs for change management and culture in place. With full and effective change management processes defined and adhered to, the digitalisation experience will be smooth and highly effective, delivering the huge returns on investment AI and digital solutions promise. Making the right choices and decisions early on is key.

Moving data to the public cloud comes with the perceived risk that there is greater chance of cyber-attack. However, the cloud can be a safer place for your data, on-prem environments can be hacked too, and when they are, the hacker can take all data from the targeted system. Cloud providers have advanced security technology and policies in place to help you safeguard your data. Data in the cloud is consolidated in a single place and protected by encryption; obscuring the meaning of the data prevents anyone who successfully breaches security from piecing it together.

Having data in a single cloud location is advantageous because backups are easier to achieve, and disaster recovery procedures are done for you. Also, data scattered on-prem is harder to backup, so moving data to a single cloud environment is an opportunity to access and make better use of all of it. Make the right choices in terms of transition and managed service providers, and your data is safe in the cloud and much easier to use with AI and digital solutions



**Cloud infrastructure and its high performance computing power is an opportunity to enable collaboration across global teams and enterprise-wide use of AI, machine learning and data analytics embedded workflows.**

**The focus within Schlumberger is to leverage our deep domain expertise combined with digital enablement to understand the customer challenge and focus on solving it with a better outcome**

to create value and drive business performance.

Schlumberger approaches cloud as an enabler of digitalisation. Cloud infrastructure is an opportunity to liberate data, break silos, share live data, collaborate across global teams and leverage high performance computing power for running AI, machine learning, and high resolution simulation. This technology is accelerating response times and delivering more accurate results, for faster and better decision-making.

Essentially, digitalisation is an opportunity to approach the E&P life cycle more holistically. No one should consider a single domain anymore; they are all connected—our teams can collaborate across disciplines. We have been able to greatly rationalise workflows, to accelerate progress, vastly increasing efficiency while minimizing uncertainty.

For example, a reservoir engineer would usually look at different field development scenarios, to determine the risk and best development plan. With near infinite computing capabilities available on the cloud, the engineer can scale up and down as they need, running different field development scenarios much faster. Creating and analyzing thousands of scenarios to produce the most optimal development plan is becoming the norm, with the increases in efficiency spanning across every project, in every domain.

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**Fig 2: Schlumberger's approach to solving data residency issues for its customers is to forge close partnerships with global technology companies, such as Microsoft and IBM, that enable digital solution deployment on public, private or hybrid cloud.**

with a better outcome. For one client we were able to take their subsurface modeling workflow from 18 months down to just 8 days.

Openness is an opportunity empowered by digitalisation. We are working openly with our partners and customers to embed best-in-class AI, analytics and digital solutions that are transforming our industry from within—the benefits are profound. In seismic processing, we've slashed timelines from 13 months down to 2.5 months for tomography, salt interpretation and depth migration, and log splicing; reconstruction and interpretation is now being delivered in weeks to hours. Domain experts in reservoir engineering who previously worked on 120-day simulation projects can now do the same work in three days and fault interpretation takes 80% less time.

We are delivering these results by tying business objectives to the domain data. In production, we have seen reductions of over 89 percent in time spent performing and reviewing candidates for workovers, and 88 percent cost-savings achieved by eliminating routine work and reducing time—worth an estimated US\$160,000 per year—with expectations of increasing ROI by 48 percent over the next five years. To me, this highlights the largest opportunity of digitalisation. Liberated data augmented by AI embedded into digital solutions in the cloud is an opportunity to reduce HSE risks, while dramatically increasing productivity, reducing the cost per barrel and decreasing time to first oil.

**Digital innovation has become the most powerful way to drive transformations in efficiency and performance**

### What are the main data residency issues facing energy companies?

In some countries and for some organisations, public cloud is not an option. Governments or oil and gas regulatory bodies either implement strict restrictions on the export of hydrocarbon data under general data residency laws applicable to energy companies and service providers, or in the production sharing contracts they make with them.

Additionally, in countries where there are no express restrictions on hydrocarbon data export, some types of hydrocarbon data can be captured under a broader legislative restriction on the export of state secret, or similar kinds of sensitive data. Similarly, with the increased focus on the protection of personal data around the world, some countries (i.e. China, India and Vietnam) are implementing broad reaching data localisation laws applying to “important data” or similar terms, which, while predominantly intended to capture personal data, could be interpreted as covering hydrocarbon data.

Generally, the types of laws I have outlined restrict the export of the related data and this restriction includes hosting data or parts of the data on cloud servers outside of the country of organization, without the authorisation of the relevant regulator or government body. We have found that obtaining consent is extremely difficult and it is very rarely achieved, therefore, energy companies that must comply with these regulations are unable to access public cloud-based E&P offerings. Alternative hosting solutions are needed to ensure these customers reap the benefits of the full range of AI and digital solutions we offer—local deployment on private or hybrid cloud has emerged as a highly favorable option.

### What is Schlumberger doing in terms of overcoming data residency challenges?

We have taken a strategic, multipronged approach to solving data residency challenges for our customers. The first step is to understand the challenges, which are unique to every customer and therefore require a differing array of solutions. Working with our legal function, we surveyed all countries globally to understand how data residency regulations affect each of them and looked at how we could formulate practical solutions to bringing digital technology to customers.

In some cases, we are working with customers to help regulators understand the benefits of digital transformation by building and presenting a business case together.

Another important strategy is partnering with the right companies to develop the global solutions they need. For example, to bring our digital drilling solutions to customers we are leveraging hybrid cloud technology from Microsoft, in the form of its Azure Stack solution. This has enabled us to successfully deploy the DrillPlan\* coherent well planning construction solution in-country for a customer in the Middle East.

A further partnership agreement announced in September 2020, between Schlumberger, IBM and Red Hat, is a game-changer as we seek a broad solution to overcome data residency challenges for our customers. The partnership enables Schlumberger to leverage the Red Hat OpenShift Container Platform to offer the DELFI\* cognitive E&P environment and the OSDU™ data platform to energy companies in regions with data residency issues.



This technology essentially puts a wrapper around our code enabling us to deploy it on different cloud hosting providers.

Using the container platform, Schlumberger can deploy applications in the DELFI environment across any infrastructure, from traditional data centers to multiple clouds, including private and public. This new way of hosting is addressing critical issues for our customers, facilitating in-country deployments in compliance with local regulations and data residency requirements. Together, we are enabling seamless access to a hybrid cloud platform in all countries across the globe for deployment in any region, for any operator.

### What's the significance of your collaboration with IBM and Red Hat?

Advances in AI, machine learning and data analytics mean business differentiation is, today, increasingly represented in code form—digital innovation has become the most powerful way to drive transformations in efficiency and performance. Consequently, the significance of our collaboration with IBM and Red Hat cannot be understated, through our digital leadership, we are moving the oil sector to the cloud, expanding market access to the potential of digital, globally. This is a major step forward on the journey to establishing the open and flexible digital future our industry needs.

We're providing customers in every geographic location with access to cutting-edge data analytics and AI that draws upon multiple data sources to deliver powerful new insights for better decision making, automated workflows and seamless collaboration for domain teams.

With digital solutions available through a hybrid cloud foundation built on open source, our collaboration with IBM and Red Hat has given oil and gas operators worldwide access to the flexibility, acceleration, and innovation that meaningful digital transformation requires.

### What is the timeframe for the collaboration and what has been achieved so far?

Our technical track teams began engagements with IBM/Red Hat some months ago, orchestrating development plans and training our engineering teams on the OpenShift technology. The process of porting our digital solutions to OpenShift is already progressing. We anticipate making our first deployment of a subset of the DELFI environment on OpenShift in mid-2021.

In parallel to the technical process, we are making good progress in working with partners in countries that have no access to global public cloud to identify local cloud hosting partners. As we identify suitable providers, we will work together to address digital transformation needs for customers in those countries.

For example, in the United Arab Emirates, Schlumberger, AIQ, and Group 42 (G42) have signed a strategic agreement to collaborate on the development and deployment of AI, machine learning, and data solutions for the global exploration and production (E&P) market. G42 is a leading AI and cloud computing company in the region, and have created a joint venture with the Abu Dhabi National Oil Company (ADNOC) to create AIQ. These companies are working with us, leveraging combined domain knowledge in digital technology, high-performance computing, and cloud storage capabilities to accelerate digital transformation within the global energy industry and unlock new levels of efficiency.

Our ongoing deployment plan will replicate agreements of this style in locations where customers cannot access global cloud.

*\*Mark of Schlumberger*