The Data Platform Imperative for The Oil and Gas Industry

A white paper in conjunction with **IBM**

Executive Summary

The oil and gas sector faces a critical moment. The industry that powers our modern economy is being tasked with relinquishing its core asset: fossil fuels. A growing body of policymakers and customers is demanding a shift to carbon-neutral energy systems within just a few decades. Such a move is not beyond the capabilities of the industry, but it requires thoughtful consideration of business models, ecosystems and technology pathways.

Critical to success will be the pursuit of data-driven technology platforms that are holistic and robust enough to capitalize on the exponential technologies of today while maintaining flexibility to enable the energy transition. Oil and gas operators must overcome and leverage vast amounts of data, modernize their IT infrastructures to drive digitization and implement scalable technology platforms. These platforms could enable new business models and revenue streams in a holistic way to capitalize on collaborative partnerships and supply chain opportunities within a digital energy landscape.

This whitepaper, stimulated by the Reuters panel session 'The Data Platform Imperative for the Energy Industry,' explores the challenges facing the oil and gas industry as it transitions to a new, low-carbon world. Here, the case is made for advancing business transformation through digital opportunities within new open-source digital architectures that drive innovation and collaboration to overcome long-standing industry challenges.

Oil and Gas in A Changing World

Oil and gas operators are facing unprecedented pressure to reduce greenhouse gas emissions as policymakers put climate action at the center of post-coronavirus spending plans.

A growing number of operators are seizing the opportunity. BP, Equinor, Repsol, Shell and Total have all announced plans to achieve net-zero emissions targets by 2050[i]. This requires uncovering ways to decarbonize existing operations and diversifying away from traditional energy sources into low-carbon energy markets.

The Data Challenge

It is clear that the path forward includes a broad portfolio of evolving energy sources and products. Digitization will play a central role in unleashing new possibilities within business-led transformation and data will be a critical asset to monetize.

Oil and gas operators are no strangers to data. As James Moran, Vice President of BP's dataWorx – Production, Operations and Business Services Innovation and Engineering team, says, "We've had a 40-year incremental set of investments in digital, in upstream and particularly in subsurface and wells."

However, Moran adds, because much of this investment has been in proprietary, closed systems, "where that's led us to is quite deep silos in terms of the different disciplines that we provide the technology for."

The industry has experienced a mindset shift in its approach to data and technology, particularly in the oil and gas operator space, recognizing the limits of this silo-based approach. "What we're looking for is faster integration across different workflows, particularly within subsurface," Moran says. "That allows us to make safer, better, faster decisions, and when applied to drilling the wells themselves, we should have a far safer and environmentally sound proposition coming at the end."

"In regards to tackling the energy transition, flexibility is key"

David Holmes
Chief Technology Officer for Energy, Dell Technologies

If oil and gas industry data architectures are already being stretched, it is difficult to see how they can be adapted in a timely and efficient way to cater for a vastly more diverse ecosystem of highly digitized assets, partnerships and products. "In regards to tackling the energy transition, flexibility is key," says David Holmes, Chief Technology Officer for energy at Dell Technologies. "There is no homogeneity across users of the data platform. Each will operate under different regulatory environments, they will have different technical and economic considerations, they'll have different business priorities. And that all means each potential platform user will have their own aspirations and needs."

A More Scalable, Flexible Approach

As operators address the energy transition, they will require digital innovation at scale, on a global basis. This demands a new level of industry collaboration to break down disciplinary silos and democratize data within an organization while removing long-standing barriers associated with data management, governance and sharing to drive innovation. The most promising collaboration to date has been the Open Group OSDU™ Forum, enabling the energy industry to develop transformational technology through an open source, standards-based and technology-agnostic data platform. More than 200 organizations support the forum, with significant support from global oil and gas majors and operators.

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The OSDU Data Platform "will provide, over time, the underlying data fabric to support a vast portfolio of open source and vendor-developed applications that address the needs of the entire energy industry," says the Open Group. "By accessing this ecosystem, developers no longer have to build and maintain the monolithic architecture needed to deliver unique value-add services[ii]."

Dariusz Piotrowski, Global Solutions Leader for IBM industrial sector, says it is the first time the industry has collaborated on an open-source project of this scale. "It's exciting to be a part of it, given IBM's commitment to open source demonstrated through our recent $6bn acquisition of [the leading provider of enterprise open-source solutions] Red Hat". IBM delivers the only market-ready hybrid cloud implementation of the OSDU Data Platform.

Moran notes that the OSDU Data Platform comes at an opportune time, as operators are re-thinking technology platforms and architectures to embrace the energy transition. "For us at BP, this is now a significant opportunity to unlock some of these silos [and] help with the integration of our workflows," he says. "We would like to see the same technology and approach being applied to the new energy systems that we want to work with."

Ideal at All Scales

The opportunity to use the OSDU Data Platform to unlock new value from partnerships and portfolio extensions is also clear at Equinor. "The biggest challenge today [is that] data is not easily accessible across our own organization, a challenge we share with most other companies," says Jon Erik Bjore, Equinor's Vice President of Exploration Excellence, Digital and IT. "You don't get value out of the volume. You only get the storage cost."

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Jon Erik Bjore
Vice President of Exploration Excellence, Digital and IT, Equinor

The OSDU Data Platform has the potential to help industry derive greater value from its existing data across subsurface and traditional workflows—and accelerate the sharing of that value with partners. "I think we have a lot of knowledge, from all the years we've been around, that we can utilize in the renewable business to run it more efficiently," Bjore notes.

A key benefit of the open-source nature of the OSDU Data Platform is that it not only can help the industry unleash new levels of digital agility, but can also serve as a springboard for data applications brought to market by startups and technology providers. One example of this kind of user is Houston-based inerG, which is commercializing an energy-financial technology platform to transform the way the industry uses data to plan, fund, develop, manage and transact assets[iii].

"The OSDU Data Platform has the ability today to place innovative tech companies like inerG onto a very fast track," says Celestine Vettical, CEO and Chief Products Architect at inerG.

In particular, he says, "having access to a common data platform means innovators such as inerG do not have to worry about building complex and time-consuming data definitions and schemas across the different domains within the energy industry. The OSDU Data Platform has removed non-differentiating and non-value-added necessities which once consumed a large part of the work required to roll-out innovative digital tools. Now, the focus has shifted to directly working with operators in demonstrating the business value-add capabilities and use cases within the software technology," says Vettical.

In inerG's case, the company is working with IBM to deploy its asset economics solution within IBM's hybrid cloud deployment of the OSDU data platform. This provides global energy operators with the autonomy, speed and control to maximize real-time decisions. Additionally, it significantly simplifies IT deployment and data governance processes, enabling operators to focus on applying that data to realize greater efficiency and sustainability goals.

Global collaborations driving adoption of the OSDU Data Platform

Schlumberger, a major global technology provider to the energy industry, made a strategic decision to go all in with its support of the Open Group OSDU Forum, and in 2019 donated the code of its DELFI Data Ecosystem to the OSDU Forum to form the foundation of the OSDU Data Platform. "Now, we have one data platform for the first time ever in the industry," says Trygve Randen, Global Director of Digital Subsurface Solutions at Schlumberger.

Innovation is no longer at the data platform level. It has moved to the application level where added-value workflows can drive innovative solutions.

Schlumberger has focused on partnerships to drive OSDU Data Platform progress and growth, which is why it is partnering with IBM to deploy its data management solution for the OSDU Data Platform on IBM's hybrid cloud implementation.

The Schlumberger and IBM collaboration addresses the diverse operational landscape of the global energy industry. It enables a unified user experience across hybrid cloud and in-country cloud or private cloud environments to accommodate data residency and regulatory requirements, poor connectivity, or situations where public cloud is not available. Ultimately, this provides greater choice and flexibility for operators to deploy the Schlumberger Enterprise Data Management Solution for the OSDU Data Platform while modernizing their IT infrastructures without incurring re-platforming costs.

Together, "we are looking at some quite interesting opportunities to deliver true transformation to customers around the world in the environments that are required for different operators," says Randen. "It's a very exciting journey."

Journey to Cloud

An ongoing consideration for oil and gas operators is embracing the speed and agility unleashed by cloud technologies within their global operational environments.

Many energy markets remain heavily regulated, and data residency and in-country data requirements limit the scope and access for public cloud hosting. Additionally, the size and complexity of data within the subsurface domain has remained an industry challenge. In practice, overcoming these challenges will continue to see oil and gas operators deploy data and applications through hybrid cloud technology—a combination of public clouds, on-premise hardware (or private clouds) and edge deployments.

A hybrid cloud technology approach can improve value by two and a half times compared to traditional on-prem deployments, according to research by Hurwitz & Associates[iv]. In this context, it is significant that oil and gas operators can take advantage of a hybrid cloud implementation of the OSDU Data Platform today.

David Holmes points out that Dell Technologies is partnering with IBM precisely to deliver added deployment flexibility to customers as part of the wider package of simplicity and integration that comes with the OSDU Data Platform.

Dell Technologies' work with the OSDU Forum is really founded on the common premise it shares with IBM and Red Hat around open source and flexibility, which is enabling the OSDU Data Platform to be deployed in a variety of different ways. Some will choose public cloud, and there is a community of users who want flexibility. They will need deployment at the edge of their networks. Others will need on-premise environments or deployment across shared services. Dell Technologies is committed to building a range of infrastructure solutions in partnership with IBM and Red Hat, to provide the community with flexibility.

"The aspect of our partnership with IBM I'm most excited about is building capabilities that will allow the industry to deploy energy workloads in the location that makes the most sense, taking into account things like network latency, local regulations and economic considerations," Holmes says.

Looking Ahead: Use Cases

As the industry drives toward adoption of the OSDU Data Platform and accelerates the energy transition, promising use cases will emerge. Some examples cited by industry experts include:

- **Bridging the subsurface data and well data landscapes.** Currently these data sets and areas of domain expertise are siloed and not easily accessible in building a single workflow. The OSDU Data Platform aims to bridge this long-standing gap, potentially providing significant value to drive sustainable practices in drilling footprints.

- **Making data available across multiple application portfolios.** Today the data in one part of a company is not easily available to other parts of the organization because data is locked in different software applications. Unlocking data from its application and understanding data lineage and transformation will bring significant value. It will allow companies to apply advanced technologies like AI and machine learning to drive trusted insights for more holistic and impactful business decisions.

- **Reducing data transport and storage.** Moving petabytes of data between upstream players is not only expensive but also exacerbates the industry's carbon footprint. With the OSDU Data Platform, data will be made widely available from a single repository.

- **Consolidating regulatory information.** A major requirement of the energy transition will be an increased emphasis on environmental, social and corporate governance reporting. The OSDU Data Platform provides all the critical elements to help drive this.

The consistent features of OSDU Data Platform use cases are to do with unlocking data, advancing integration of workflows and engaging the larger community ecosystem in collaborating on sustainable transformation. This can help drive operational and business efficiencies in support of the energy transition.

Outlook and Conclusions

The OSDU Data Platform is a significant accomplishment and has the potential to accelerate the industry's ability to embrace digital technologies to drive a spectrum of evolving energy sources in the ongoing transformation to low-carbon systems.

The OSDU Forum has "built an environment that enables industry, academia, standards bodies and other organizations to come together and collaborate on constructing a common data platform," Holmes says. "That significantly accelerates innovation and helps people to deliver value from the data much more quickly," he comments.

Perhaps the greatest benefit that the OSDU Data Platform will bring to the industry is speed. With society clamoring for rapid change, the open-source data platform addresses 40 years of data challenges, proprietary systems, and closed innovation practices, opening up the collaborative innovation required to drive the global shift to new energy sources.

References

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