



Point of view

# OSDU: The New Game Changer in the E&P Upstream Industry

## Introduction

As the Oil and Gas upstream industry is currently going through challenging times, the main focus of explorations has now shifted towards more complex and “hard to find reservoirs.” This shift has resulted in higher exploration and development costs and significantly large data interpretation cycle times. There is also an industry-wide emphasis on achieving lower costs and faster “time to first oil.” These gains can be made by increasing efficiencies, adopting emerging digital solutions, and technological advances like AI-ML workflows, big data analytics, HPC, data storage, cloud, and edge computing. However, traditional methods of storing Exploration and Production (E&P) datasets are not suitable for leveraging these workflows, and there is an urgent need for an upgrade.

The data lifecycle of an oil and gas asset typically extends over multiple decades. Data standardization and management across the geoscience and engineering domains have been a long industry-wide challenge. The major roadblock in adopting digital solutions and automated workflows is that most exploration datasets, such as Seismic, well log, and production data, are stored within the petro-technical applications in complex, proprietary, and internal formats. Traditionally, these databases, data platforms, and legacy Petro-technical applications are preferentially stored and run in “on-prem” models.

## OSDU: A New Game Changer

Open Subsurface Data Universe (OSDU) is a global consortium of leading Oil and Gas operators, Oilfield Services (OFS), Data Vendors, cloud providers, and Technology companies. In 2018, the OSDU Data Platform, a cloud-native standard data platform specifically for the oil and gas industry, was developed by the Open Group OSDU™ Forum. The core principle of this platform was to separate data from the applications. It aimed to reduce the challenges of data silos and put the subsurface and well data in an open standard-based ecosystem. This attempted to resolve the problems of accessing complex E&P data traditionally stored in non-standard repositories within software-vendor-proprietary data models and custom applications.

## The OSDU Data Platform: A Few details

The OSDU Data Platform provides reference architecture and implementation. The Petro-technical applications and microservices access the datasets and run on the OSDU data platform using Application Programming Interfaces (APIs). The data and application architectures are flexible by design, so new data types and ingestion mechanisms can be added without rewriting the whole codebase.

The OSDU data platform is a cloud-native platform and can be deployed on AWS, GCP, Azure, and OpenShift on the IBM cloud.

The full commercial deployment of the OSDU data platform was released as the Mercury Release (R3) on March 24, 2021. Currently, it supports exploration, development, and well datasets, primarily with upstream production and drilling datasets to be added in the next release. Future plans include incorporating new energy sources like wind farming, carbon capture, and storage and Geothermal energies.

## OSDU Adoption for Oil and Gas Companies

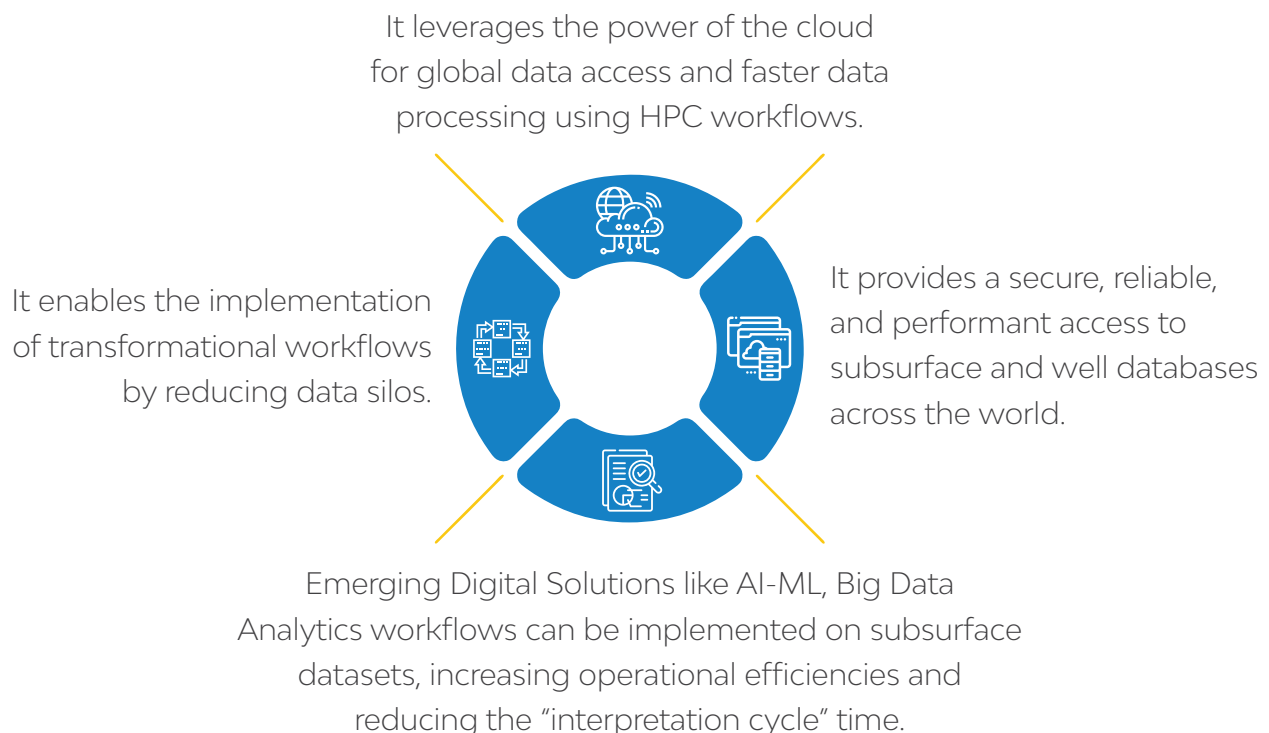
Data being the heart of any successful exploration, a successful transition to OSDU, needs the following major steps to be implemented:

- ▶ **Evaluation of the current digital maturity of the Oil and Gas Company:** The initial steps include defining the strategy, roadmap, orchestration of business workflows, cloud adoption path, identification of key petro-technical applications, and integration of legacy applications. The concurrent evaluation of the current level of digital maturity is ideal. Such an exercise will quantify the integration between applications, data quality, data repositories, and orchestration of business processes within the organization. Based on the results, the initial pilot projects and subsequent OSDU Adoption can be planned.
- ▶ **Master Data Creation, Data migration and Management:** An upstream master data repository for each data type, such as Well Master DB, Seismic Master DB, has to be created after detailed quality checks of the subsurface data in terms of consistency, correctness, and completeness. All Work Products need to be matched against the parent entity within the master DB. For example, each Well log must be associated with a unique well bore id before ingestion to the OSDU data platform. Meta-data needs to be extracted for all work products to ensure all data in the OSDU data platform can be searched and retrieved based on their metadata content.

- ▶ **OSDU Data Platform deployment** on a cloud platform of choice.
- ▶ **Data ingestion and enrichments workflows** need to be implemented based on OSDU Data Platform standards. These include the creation of data loading manifests based on work products. Typically companies prioritize one or two business cases for Pilot project execution before enterprise-wide migration.
- ▶ **Legacy application modernization:** The legacy petro-technical applications need to be re-engineered for microservices and API-based architecture. The applications will use generic and domain-specific APIs to access data on the OSDU Data Platform.
- ▶ Implementation of Data analytics, DM services, Data Mart workbenches, and tools for continuous cloud performance monitoring using Key KPIs.

## Advantages of OSDU Data Platform

The main advantages OSDU data platform include:



## Conclusion

The OSDU Data Platform focuses on data governance, industry standards, and building interoperability between interpretation toolsets and analytical workflows. It is a single unified cloud-native platform for datasets, from exploration to drilling and production, providing much-needed integration across business workflows enabling greater efficiencies and better decision-making. The OSDU Data Platform adoption for any Oil and Gas Company needs to be a well-planned multistage project that extends from evaluating the current levels of digital maturity to the actual deployment of the OSDU instance, data ingestion, and modernizing Legacy petro-technical applications. The initial costs and efforts of OSDU data platform deployment are typically recovered in a couple of years due to multiple major benefits. These advantages include cost and time efficiencies of Oil and Gas operations.

## LTIMindtree's Role in the OSDU

LTIMindtree has been a silver member of the OSDU forum since 2019. Our techno-domain experts have contributed to multiple workstreams for the OSDU R3 release, including Entitlement and Obligations, Application Testing, and Cloud performance monitoring. LTIMindtree has implemented multiple projects for large E&P and OFS clients encompassing Data migration, Application modernization, and integration to the OSDU Data Platform, Well Construction, and Edge computing.

LTIMindtree has built a set of proprietary tools and accelerators, including EPDM (a subsurface data platform), GeoProQuik (A rule base data QA QC ETL tool for subsurface datasets), and CloudEnsure ( KPI based Cloud performance monitoring tool) for enabling the O&G companies to adopt the OSDU data Platform.

## About the Author



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Sidhartha holds a Master's degree in Applied Geology from IIT-Roorkee and has 15 + years of work experience as an integrated Exploration Geoscientist in the Hydrocarbon Upstream Industry. His current role includes providing strategic solutions for multiple subsurface Data Management, Data transformation, and well planning automation projects. Sidhartha's areas of expertise include oil and gas exploration workflows, subsurface data interpretation, drilling plan optimization, OSDU adoption, petro-technical application deployment, and support for the Oil and Gas industry.

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