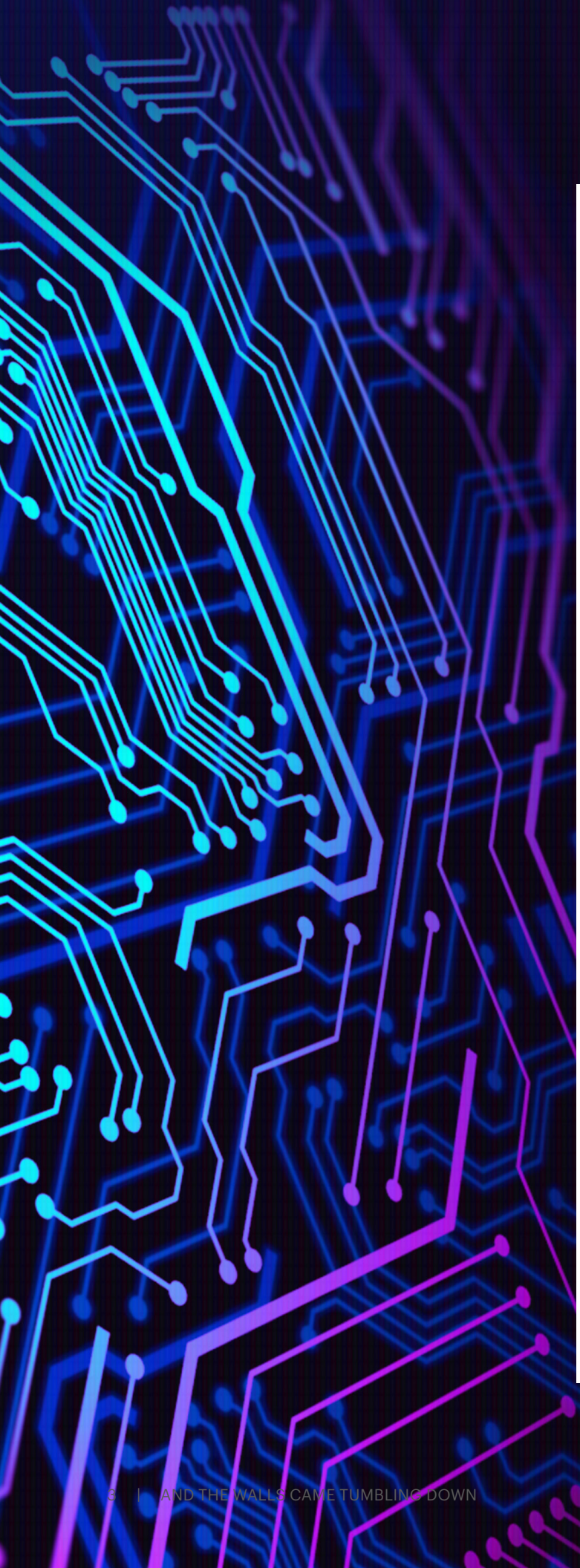
And the walls came tumbling down

The OSDU™ Data Platform is dismantling the data silos of energy companies once and for all

A core requirement for successful digital transformation in the exploration and production (E&P) sector is a robust, reliable data foundation—one that enables users to access, store, share and manage data across the enterprise. Energy companies understand the benefit such a platform might deliver. Yet, their efforts to rein in their data complexity are stymied by disparate data sources, applications and proprietary systems that trap data in silos.

The OSDU™ Data Platform has the potential to transform how operators store, manage and consume data and insights—leading to 5 to 15 percentage points improvement in return on capital employed (ROCE).

The Open Group OSDU™ Forum has designed a cloud-based platform to overcome these challenges. It has the potential to dramatically improve application interoperability, accelerate workflows and drive operational efficiencies—all while delivering meaningful insights that inform better, faster decision making.



We believe the OSDU Data Platform has the potential to unlock real value in three ways:

- Through **direct infrastructure cost savings** driven by data storage efficiencies and duplication avoidance.
- Through **application and data management efficiencies** that arise when data across domains (e.g., subsurface, wells and production) can be stitched together and managed in an industrialized way (i.e., via a data "factory").
- Through the creation of **new operational workflows** and a "closed loop" capability that not only eliminate mapping and modeling redundancies, but also enable operators to quickly respond to market signals and take actions to adjust production dynamically, in the most economical way.

Our analysis shows that by activating these three direct and indirect value levers, operators can achieve 5 to 15 percentage points increase in return on capital employed (ROCE) depending on their current digital maturity and the value that still remains trapped in the organization.

Upstream companies are understandably intrigued by this new offering. But they are also cautious. Is the OSDU Data Platform too good to be true?

Data is exploding. So is the urgency to manage it effectively.

The global transition from fossil fuel-based to renewable energy sources is forcing oil and gas companies across the value chain to rethink everything from their business models and cost structures to their day-to-day operations. For energy companies, the energy transition is bringing with it a shift in priorities. Business resilience, portfolio agility and sustainability have taken center stage. The volumes of oil and gas produced are now much less important than the value that can be extracted from every molecule.

In this fast-changing, value-focused environment, upstream companies have to make better, faster decisions. They need granular insights and analytics to capture as much value as they can from their existing assets and operations. And they need connected infrastructures and operations to enable new levels of collaboration and agility. Achieving each of these imperatives requires a strong data foundation. Such a foundation underpins all digital transformation. And all innovation.

Unfortunately, upstream companies aren't using the mountains of data at their disposal for maximum effect.

The main barriers are the data silos and disjointed processes, databases and platforms that impede visibility, application interoperability, workflows and collaboration across areas such as engineering, maintenance, production operations and even finance. The truth is that a large percentage of data that could be integrated to gain an end-to-end view of operations is not used at all. The problem is only getting worse. We've found that data volumes of a typical energy company double every 12 to 18 months. [1]

Upstream leaders are starting to wrest control of their data landscape by investing in new data capabilities, artificial intelligence (AI) solutions and cloud infrastructures. That's a step in the right direction. But because the underlying data that fuels these new capabilities is still scattered, non-standardized, duplicated, or is vendor-specific or of questionable quality, upstream operators have captured just a fraction of their data's value.

The good news is that companies can finally start reclaiming that value. A robust data platform is now available that aims to solve the underlying data structure, storage and access challenges that have plagued the energy industry for decades.

A new kind of data platform

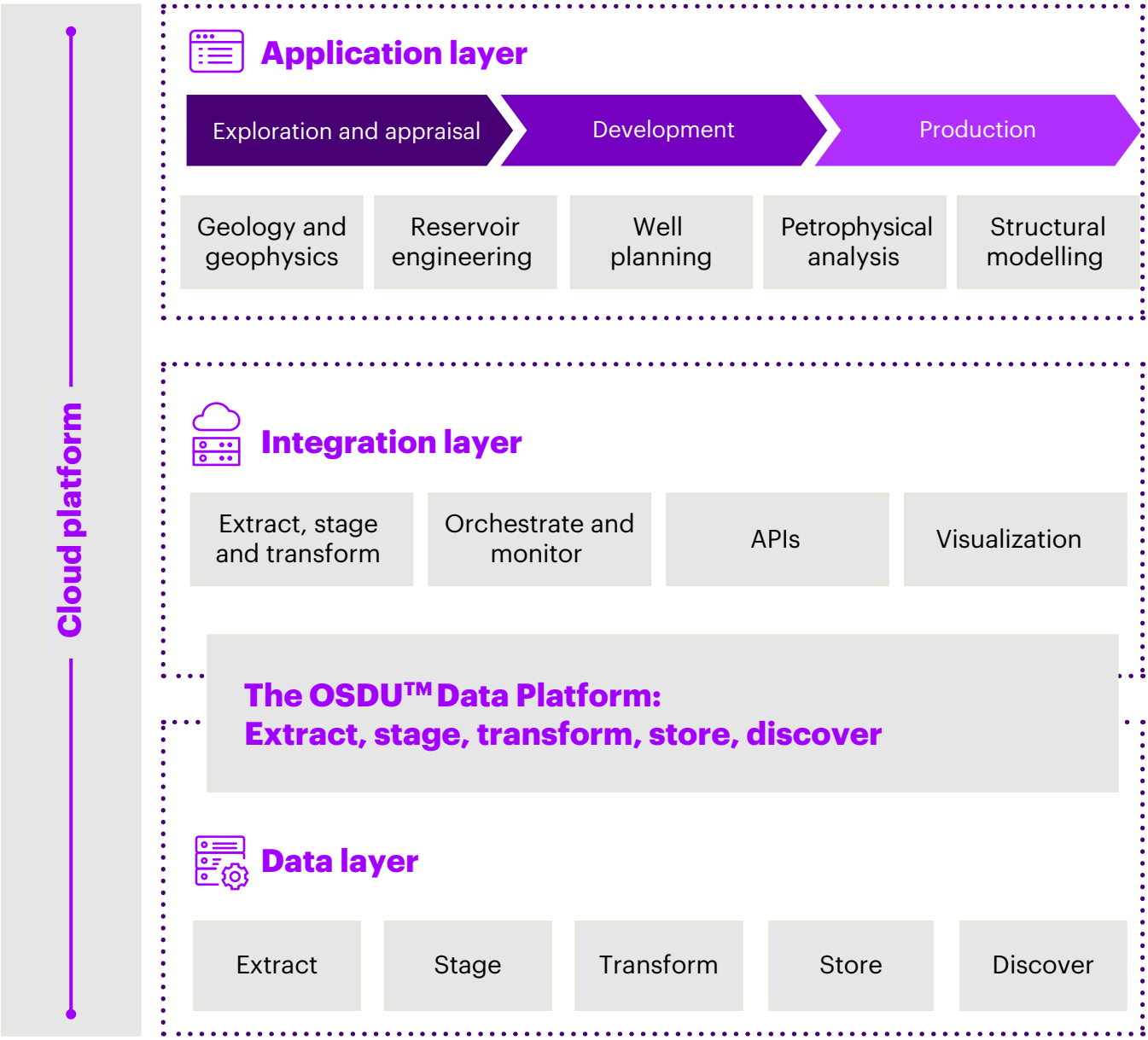
The OSDU™ Data Platform comprises a set of services and workflows that enables operators to store all subsurface, wells and surface, and new energy data into a single reference data platform. The open-source, cloud-based and technology-agnostic data platform solves the upstream energy industry's data structure, storage and access challenges in several ways including:

Contextualizing data in a single system of record. That means data that has been historically siloed is readily available for analytics, advanced computing and digital transformation.

Lowering data storage costs by eliminating data duplication.

Increasing the pace of innovation by removing data silos and proprietary data formats. Application developers have easy access to usable data (irrespective of its source), enabling them to provide better solutions to solve operators' problems.

The OSDU Data Platform sits on an underlying cloud platform, deployed to an operator's cloud environment of choice. It comprises the data layer of an organization's technology stack. Importantly, by straddling the data and integration layers of the stack, it also enables modular access between data and applications through application programming interfaces (APIs). The figure below depicts the three layers of the technology stack and the various software vendor choices (non-exhaustive) operators have to make to optimize their unique workflows.



Source: Accenture analysis

The capabilities of the OSDU Data Platform are similar to other data platforms. What is different about the OSDU Data Platform, however, is its focus on E&P data domains. The Open Group OSDU™ Forum, an international vendor and technology-neutral consortium that has come together to create reference implementation standards and formats and create transformational technology to support the world's changing energy needs, designed it that way. Since the Forum inception, numerous operators, oilfield service providers, cloud service providers and technology service providers have joined.

Together, Forum members are continually advancing the capabilities and uses of the OSDU Data Platform. For example, the OSDU Forum most recently published guidelines for Domain Data Management Services (DDMS) for each "OSDU Domain." These guidelines refine and streamline data access, storage and integration for specific domains—and help ensure that access and integration services are aligned with each domain's needs. Moving forward, the Forum anticipates the next release of the OSDU Data Platform will bring together data and information for a broader range of energy sources, as well as for carbon capture, utilization and storage (CCUS) purposes. By bringing together data from multiple energy sources—including wind, solar, geothermal and hydrogen—the OSDU Data Platform will enable operators to optimize their entire supply chain.

The OSDU Data Platform provides operators and vendors access to trusted data that not only informs better decisions, but also enables the development of scalable and seamlessly integrated industry solutions. Collaborations within and beyond the industry will propel cross-functional creativity and facilitate faster innovations.

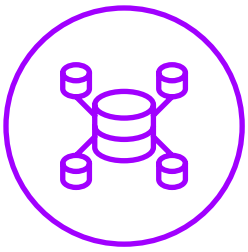
Making the move to the OSDU™ Data Platform

Upstream operators looking to embrace the OSDU Data Platform can look to a smoother transition by taking five actions:

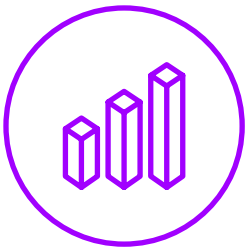
1. Assess the current state of data in the organization, user requirements and business goals. Operators should conduct a readiness assessment and determine which intellectual property should be retained and which can be complemented with an open-source system of record. More broadly, they must recognize that the move to the OSDU Data Platform is more than a technology play. It will enable (and require) new workflows, applications and analytics. Is their workforce ready to embrace this level of change?

2. Imagine a new data future. Operators should set a vision for what they want to achieve. Some, for example, may want to release more value from existing data assets. Others may want to use data in new ways to support new business models emerging from the energy transition. The strategy for business growth should dictate the strategy for data utilization.

3. Plan for the migration to the OSDU Data Platform. It will be essential for operators to design an integrated, end-to-end environment that fully empowers and leverages the new platform's capabilities. The plan must be comprehensive, covering everything from cloud migration to the future use of analytics and applications



4. Select ecosystem partners wisely. In building out the application and integration layers of the OSDU Data Platform, operators will need to ensure they are teaming with technology providers that can support their vision and deliver the data and innovation outcomes they desire. Cost will be a consideration, to be sure. But so will the services, offerings and areas of focus these providers bring to the table. Vendors are already creating services focused on data ingestion, visualization, contextualization, interoperability and more. Some are offering their solutions as managed services, others as a SaaS solution. Additionally, different vendors have different strengths and business application capabilities in different domains—from drilling to reservoir management to production. Operators should evaluate vendors on all of these criteria, and many more.



5. Build and scale. Operators need not feel that they have to take a big bang approach to migrating to the OSDU Data Platform. Given the domain-specific guidelines that are being now produced, it will be possible to initiate the program within a single domain, evaluate progress and expand from there. As operators scale their OSDU Data Platform environments, they must continually monitor opportunities to improve their data-driven innovation agenda.

All things considered

The decision to adopt the OSDU Data Platform as a system of record cannot be made lightly. Several factors must be taken into consideration during the planning phase:

- **Existing infrastructure investments.** Most operators have developed their own data and application infrastructures to carry out their day-to-day operations. Introducing the OSDU Data Platform will likely disturb the existing infrastructure. Yet, historical data loaded into the new platform can be transformed, enriched—and ultimately made more valuable to the business. Before making the switch to the OSDU Data Platform, operators will need to weigh the benefits of enriched data and also assess the level of disruption they would be able to tolerate during the transition.

- **OSDU Data Platform maturity.** Because the OSDU Data Platform is new, operators may question its quality and breadth of services, workflows and functional applicability. However, the OSDU Data Platform is evolving rapidly. Also, the transition to the OSDU Data Platform is an incremental process, which means operators can start small and scale the solution over time. The determinative factors should be whether a business case can be made to justify the transition and whether the organization has the appetite for change such a move would require.

- **Vendor "lock-in."** While the OSDU Data Platform addresses a number of data quality, data exchange and data contextualization issues, operators will still need to engage with technology partners to enable workflows on top of it. Some operators are nervous that they will select independent software vendors that are unable (or unwilling) to enable the exchange of enriched data and interpretations between applications. The OSDU™ Forum's recent release of Domain Data Management Services guidelines—which stipulate that all technology providers will need to deliver domain data services in a way that is compliant with the OSDU™ Technical Standard—should alleviate much of that concern.

Liberate innovation by liberating data

Upstream operators have long contended with data silos that limited their abilities to generate insights, develop innovations and make decisions that support business growth and business resilience. The OSDU Data Platform has the potential to eliminate the silo-induced challenges associated with data access, contextualization, standardization and interoperability. While there are still a number of unknowns, we believe the potential value of this new industry-standard data platform is enormous. And we believe those that make their moves now will be among the first to reap the benefits.

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