

OIL & GAS EXPLORATION FIRMS TURN TO  
CLOUD OBJECT STORAGE TO LEVERAGE  
DATA ASSETS AND IMPROVE PROFITABILITY

Stratecast

F R O S T  S U L L I V A N

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## INTRODUCTION

Oil and gas exploration firms are facing unprecedented market challenges. Factors such as weak oil prices (\$53 per barrel in March 2017; down from a peak of over \$100 in mid-2014),<sup>1</sup> regulatory pressures, and the need to develop new oil sources are squeezing margins, forcing firms to reassess their capital investments.

At the same time, the opportunity remains high. Oil consumption is expected to increase by 18% between 2010 and 2030; and gas consumption will increase by 52% in that time, according to Frost & Sullivan research.<sup>2</sup> In addition, as firms focus their efforts on recovering oil reserves from unconventional sources (for example, shale oil and oil sands), Frost & Sullivan expects output from such resources to more than triple between 2014 and 2030.



Oil consumption will increase by 18% between 2010 and 2030; and gas consumption will increase by 52%, according to Frost & Sullivan. Output from unconventional sources (e.g., shale oil and oil sands) will more than triple during that time.



To remain competitive, oil and gas exploration firms are increasingly turning to their data assets as a means to improve efficiency and productivity.

- Firms are collecting and analyzing more data, of various types—including photographic images of on-shore and off-shore assets, seismic activity charts, and climatological records—to help identify the most profitable drilling sites.
- They are deploying powerful software solutions to aggregate and archive raw data and applications on a per-project basis, as a way of retaining institutional knowledge long after the project is over.
- To optimize investments, they are utilizing analytics to identify which potential drilling sites are likely to be profitable now; and which to revisit in the future when oil prices rise or extraction costs decrease, and profitability is better assured.
- As a cost-effective alternative to acquiring new data, firms are also looking to revive and re-use long-idle data from past projects, wherever possible.
- Furthermore, companies are responding to user demands that data assets be continuously available, from any device in any geography, to facilitate timely decisions.

<sup>1</sup> NASDAQ, [Crude Oil Prices](#), 2014-2017

<sup>2</sup> Frost & Sullivan, [Global Oil and Gas Industry—Trends and Technology: Advanced Integrated Asset Management and Unified Communication Technologies Poised to Make a Mark As Digital Oil Fields Become Widespread](#) (January 2016)

## THE STRUGGLE TO DERIVE VALUE FROM DATA ASSETS

In many cases, oil and gas exploration firms are falling short in the effort to derive valuable insight from the data they have collected. According to a 2015 report by McKinsey and Company, of 30,000 data points collected from a typical oil rig, less than 1 percent is used for decision-making, with the remainder discarded or stored unexamined.<sup>3</sup> The underutilization can be blamed, in large part, on inadequate storage systems—systems that make it costly and difficult for geographically dispersed workgroups to access the data they need, when they need it. Traditional storage systems cannot easily scale to keep pace with today’s rich data sources and growing volumes. Firms end up paying a high price to store inactive data that is never accessed.



The underutilization of data by oil & gas exploration firms can be blamed, in large part, on inadequate storage systems—systems that make it costly and difficult for geographically dispersed workgroups to access the data they need, when they need it.



For most oil and gas firms, their storage architecture was established many years ago, when oil prices were higher, budgets were more flexible, field research activities were more limited, and data volumes were more manageable. Collected data was stored in traditional Network Attached Storage (NAS) arrays, and ultimately archived in tape repositories that were cumbersome to retrieve and manage.

The old approach is ineffective in today’s environment: too slow, inflexible, and costly to meet accelerating needs. Today, oil and gas firms require a new approach to storage—one that enables them to:

- Contain costs to improve margins in the face of price volatility
- Shift budget from capital expenditures to flexible operating expenses
- Scale to accommodate growing volumes of unstructured data and a variety of data formats, without impacting availability or performance
- Make even older data quickly accessible for multiple users, across multiple geographies
- Integrate data from multiple sources
- Protect data from loss or breaches
- Minimize the management burden

In addition, the storage solution needs to be flexible, to support a new generation of intelligent analytics workloads that may require real-time access to data, over time, from multiple sources. Data analytics and artificial intelligence are increasingly used to:

- Identify which potential drilling sites are likely to be profitable now, and which to revisit in the future,

<sup>3</sup> McKinsey & Company, [An executive’s guide to the Internet of Things](#), August 2015.

when oil prices rise or extraction costs decrease, and profitability is better assured

- Explore unconventional oil resources; predicting extraction costs and yield
- Analyze equipment usage data to better tune maintenance activities; thus, increasing the field life of equipment and decreasing maintenance costs
- Interpret geologic data to predict seismic activity, in time to protect workers and equipment

To create a storage strategy that optimizes price-performance and enables effective data analysis, many oil and gas firms are turning to the cloud. Cloud storage offers scalable, cost-effective capacity on demand, without capital investments. By migrating older, inactive data to a cost-effective cloud storage service, firms can ensure it will be available as needed, whenever that may be. That makes it easier to access older data and project records, to look for correlations in data that may be years old; and for new scientists in emerging areas to capture and apply learning from employees who may have moved on to new roles months or years ago.

To derive maximum benefit from the hard-earned data they collect, oil and gas exploration firms must ensure their cloud storage meets their needs for flexible deployment, immediate access, data durability and consistency, simple management tools, and the greatest cost-efficiency possible to meet the volatile needs of the industry.

## WHY OBJECT STORAGE?

*Object Storage* is a flexible and scalable storage structure that stores all data as discrete objects in a flat name space; along with metadata about the objects. Object storage allows all types of data—structured (e.g., databases) and unstructured (e.g., images, video, maps)—to be stored and managed together. The scalability inherent in the object storage format ensures that data performance remains high, regardless of how fast or by how much the data store grows.



By utilizing cloud object storage for second-tier or archived data, firms can defer capital expenses and improve their cost structure, while increasing data availability and accessibility.



For oil and gas exploration firms looking to maximize the value derived from large and growing volumes of digital assets, cloud object storage can provide a valuable and cost-effective complement to on-site storage systems. Older or inactive data can be moved to the cloud, where it can be quickly and easily accessed by geoscientists, engineers and data managers, whenever they need it. As data is moved into the cloud, this frees up capacity in existing on-premises storage systems—thus deferring capital investments for expanded capacity. By utilizing cloud object storage for second-tier or archived data, firms can improve their cost structure, while increasing data availability and accessibility in a way that can contribute to profitability.

## HOW THE RIGHT OBJECT STORAGE PROVIDER CAN BENEFIT OIL AND GAS EXPLORATION FIRMS

However, not all object storage providers are the same. To maximize the value of their digital assets, oil and gas exploration companies require sophisticated features and capabilities that will optimize storage performance and efficiency, at low costs. In searching for the right object storage partner, firms should look for these capabilities:

- **Flexible deployment options (private, public, hybrid cloud):** Exploration firms collect and utilize data in multiple ways. The most effective architecture may call for a hybrid solution that deploys the cloud object storage platform both on-premises and in the cloud. Such an architecture would allow data for active projects to be stored in the data center; with easy migration to the cloud, as the data is utilized less or projects are discontinued. A cloud object storage solution with flexible deployment options (on-premises as well as dedicated hosted cloud) can simplify management and control across the hybrid environment.
- **Support for multiple data formats and sources:** To maximize the value of data, exploration firms must integrate and analyze a variety of data types from multiple sources. Application Program Interfaces (APIs) for leading proprietary and open source object storage protocols will allow exploration firms to ingest and analyze data from traditional and unconventional sources and types, such as weather information, political news, and video.
- **Data security and availability:** To maximize the value derived from digital assets, the data needs to be always available and always consistent; not subject to loss in the case of system disruptions or breaches. The right object storage service has an architecture that assures data consistency. Ensure that the provider's architecture supports data availability even in the event of a severe regional outage—without requiring you to pay high costs for cross-regional availability. Consider IBM Cloud Object Storage's patented "geo-dispersal" and erasure-coding technology. When data is written to a region, it is automatically encrypted, erasure-coded, and "sliced." This process ensures that the data is and remains consistent across data centers. This patented technology also protects the data in the event of a data center breach, since no data center has all the "slices."
- **Budget efficiency and cost containment:** Offloading inactive data to cloud object storage allows oil and gas firms to better manage the capital budget for on-premises storage systems, enabling them to postpone storage purchases for as much as two to three years, depending on their data volume. At the same time, by backing up or transferring digital assets into the cloud, firms can minimize operational costs through efficient, usage-based pricing.

In comparing cloud object storage providers, consider total costs for all your cloud-based storage, not just the storage cost-per-GB. Consider costs associated with ensuring the level of availability you need, including storage and data transfer costs for any replication or backup activities to achieve geographic redundancy. With IBM Cloud Object Storage, the patented geo-dispersal technology essentially allows you to pay once to store your data across multiple data centers, without incurring inter-regional data transfer charges.

- **Ease of management:** An increase in storage volumes should not require a corresponding increase in management time, effort or expertise. The right cloud object storage platform utilizes automation and sophisticated functionality to simplify management activities, and ensure predictable, optimal price-performance in both premises and cloud deployments. For example, IBM Cloud Object Storage offers a “software-defined, hardware-aware” platform that enables firms to maximize storage performance, and speed time-to-production, all via a single management console.

## CONCLUSION

For oil and gas exploration companies of the future, the ability to extract value from data will drive the ability to cost-effectively extract fuel sources from the earth. With little margin for error in this capital-intensive and volatile industry, firms need to accurately identify, purchase, and analyze on-shore and off-shore assets; and extract the fuel as quickly, efficiently, and profitably as possible.

To do so requires collecting, storing, maintaining, protecting, and analyzing increasing volumes of data—sometimes over a protracted period of time. It requires integrating on-premises and cloud storage solutions, to ensure data assets are placed in the optimal environment, based on price-performance. And it requires data to be secure, consistent, and always available to geoscientists, data analysts and engineers, worldwide, whenever they need it.

To meet these needs, successful oil and gas firms should implement a powerful object storage solution. Their future success may depend on it.

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*For information about IBM Cloud Object Storage, click [here](#).*

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