

UTILIZING SEISMIC DATA PROVIDES A MAP TO DE-RISK EXPLORATION

3-4 CLICKS

For data delivery vs days to weeks

Impact

- Data is accessible to the customer immediately once a contract is signed, versus taking 2 weeks to be received
- What took 3-4 full-time employees to deliver data to customers is now a one-person job
- Reduced need for manual processes to manage data, resulting in fewer human errors
- Verifiable workflow maintains an audit trail which includes information about how and when products were created, verified, and made available to specific clients

Searcher Seismic is an independent multi-client company, headquartered in Western Australia, that provides high quality, non-exclusive subsurface datasets to the global Oil & Gas industry. Searcher's leading edge data sets are used by their customers to de-risk their exploration portfolios in a cost-effective manner. Searchers' vision is to be the global multi-client company most admired for its commitment to quality products, mutually beneficial partnerships and total customer satisfaction. Seismic data is the principal geophysical method used to image the subsurface in both land and marine environments.

Searcher Seismic has built and continues to expand a global data library of seismic, gravity, magnetics, geochemistry and other data types used by the oil and gas industry to meet exploration objectives. Using seismic surveys, explorers produce detailed images of the various rock types and their location beneath the Earth's surface. Scientists analyze the collected data and use it to create maps of geologic structures that lead to energy resources beneath the ocean floor. They use this information to determine the location and size of oil and gas reservoirs.

Efficient exploration with less impact on the environment

For oil and gas companies, seismic data is a critical component used to plan locations for wells, reducing the need for further exploration, and minimizing environmental impact. Without this data, it would be impossible for producers to locate deposits of oil and natural gas in the challenging environments in which they operate today.

For any company, like Searcher Seismic, combing through a library of 20PB of data can be time-consuming and extremely costly, as it is a very labor-intensive process. As the company's data resided on SANs and large drives, tapes, and USB's, this made data auditing and discovery nearly impossible.

"Seismic surveys cost upwards of 10's of millions of dollars so ensuring data integrity is critical, as technological improvements in reprocessing can significantly improve imaging of legacy data. Machine learning is quickly gaining traction for seismic data analysis however, in our feasibility testing 80-90% of the time was spent decoding flat files to use in deep learning frameworks. Only 10% of the study was for the geoscientists and data scientists to derive meaningful results, and that clearly indicates data management is the problem to solve," says Joshua Thorp, VP Data & Analytics, Searcher Seismic.

Current data management practices are prone to human error and often require physical media transcription or handling before the data is even accessible. Data delivery to clients was also becoming a growing problem as the workflows could not scale well with increased complexity and size of each data order.

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Joshua Thorp, VP Data & Analytics,
Searcher Seismic

Providing data on-demand

Searcher Seismic turned to Cloudera’s technology stack and Professional Services team to achieve their goals. This has enabled the company to build a new product offering, Saismic™. This cloud-based service provides global seismic data on-demand with native support for deep learning and advanced analytics.

Saismic™ offers the oil and gas industry an innovative and smarter way to interact with data on the premise that it should be adaptive, flexible and compatible with today’s big-data tools. Exploration, coupled with the power of machine and deep learning techniques such as object detection and image segmentation, allows images to be easily classified and used in identifying hydrocarbon indicators.

Transforming big data with machine learning and artificial intelligence

This global library of data has been deconstructed from the rigid flat file format traditionally associated with seismic, and transformed into a distributed, scalable, big data store. This allows for rapid access, complex queries and efficient use of compute - fundamental criteria for enabling big data technologies such as deep learning.

As machine learning becomes more widely adopted in the oil and gas industry, the need for organized data with known provenance and usage rights has never been greater. The majority of currently available seismic data is fraught with challenges, ranging from legacy file formats and inconsistent metadata to dynamic range problems.

Saismic™ solves these problems by collecting, standardizing and storing seismic data on a modern big data infrastructure. With support for cloud, on premises and hybrid deployment models, Saismic™ can be streamed anywhere, anytime, and to any system.

Cloudera offers Searcher Seismic data management, an enterprise data cloud platform with self-service access to governed data and open tools for end-to-end analytics and machine learning workflows. In addition, Searcher is also using Apache Spark and Apache Hbase so instances can be deployed anywhere, including a cloud and hybrid cloud environment. The company implemented a hybrid cloud approach with a high speed fibre link to a cluster in the data center, which has direct links to Microsoft Azure and Amazon Web Services - Google Cloud Platform is forthcoming.

Enabling large datasets to be accessed anywhere

Saismic™ allows data access, seamlessly and efficiently across the entire organization. Employees can view all data which is available immediately via a web portal, with access based upon verified login credentials. For clients, data delivery was a two-step process that started once a contract was signed. Key data was shipped within 24 hours, with the remainder following in 2 weeks. Now, from the moment the contract is signed, the data can be pushed to the client’s cloud vendor of choice, allowing instant access to data.

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Lastly, we have reduced the need for manual processes to manage the data, resulting in fewer human errors. Our verifiable workflow maintains an audit trail which includes information about how and when products were created, verified and made available to specific clients. Data lineage is huge for us," says Thorp.

The Searcher Seismic team also saw value through partnering with Cloudera Professional Services.

"We used Cloudera's professional services team for their machine learning and data science expertise, implementation of the enterprise data platform, and they assisted us to design and implement a training pipeline. They were instrumental and came in with experts to provide all of this before our team took over," said Thorp.

Searcher Seismic turned to Cloudera's technology stack to achieve their goals. The company created a new product, data as a service, for the Oil and Gas industry. This was both strategic and innovative, allowing Searcher Seismic to create a new revenue stream. The company continues to innovate, as it has recently completed the expansion of its modern offshore data library with the completion of its Northern Basins Prospectivity Study in Papua New Guinea.