

LIVING ON A CLOUD

Murphy Oil Corporation sought a cost-effective solution to streamline the collection, storage, analysis, and automated monitoring of real-time operational data from assets dispersed across their enterprise, aiming to deliver valuable operational intelligence to all stakeholders.



OIL AND GAS



▶ CUSTOMER

Murphy Oil Corporation is an independent oil and natural gas exploration and production company with a diverse portfolio of onshore and offshore assets. Their operations are primarily focused on the Gulf of Mexico, offshore Canada, and various international locations including Mexico, Brazil, and Vietnam. Murphy has proved reserves of 724 million barrels of oil equivalent.

▶ BUSINESS CHALLENGE

Murphy Oil needed to reassess their existing processes to ensure that their supporting software aligned with their new corporate mission, vision, and values. The project team initiated critical discussions with the operations team to gain better insight into business needs and functional requirements. **The ensuing dialogue signaled a need for a centralized and automated solution to simplify the collection, storage, and analysis of time-series data.**

▶ STRATEGY

In 2018, Murphy Oil launched a global initiative to open-source all internal live-streaming data to its engineers. A technology team quickly mobilized to examine digital solutions that could meet the goals and objectives set out by the operations team.

After an exhaustive search, the team decided to partner with Canary Labs to implement the Canary System. Canary was selected because of their ability to provide an innovative, flexible, scalable, and cost-effective solution that would align Murphy's data systems with business operations.

CHALLENGE

Murphy Oil Corporation needed a centralized and automated solution to simplify the collection, storage, and analysis of time-series data across their enterprise.

SOLUTION

- Canary Cloud Historian Service
- CygNet SCADA Connector
- Canary Views
- Axiom Dashboards & Report
- ODBC and API Connectors

RESULTS

- Centralized Data Historian
- Improved Operating Efficiency
- Improved Operational Visibility
- Improved Incident Response
- Improved Drilling Performance
- Data Driven Culture

“ There was a growing demand for clean data that could be quickly linked across all data sources and be easily accessible in digital format. We were ready to shift our focus from cumbersome data management toward more advanced functions and insights. ”

ERIC HAMBLBY
EXECUTIVE VICE PRESIDENT
NORTH AMERICAN ONSHORE OPERATIONS
MURPHY OIL

For North American onshore operations, it was business-critical to sort out a data historian early on. The Canary System has enabled Murphy Oil Corporation to capture real-time data from all the business units into a centralized cloud-hosted Canary Historian. The data is then manipulated with Axiom Canary’s easy-to-use web-based visualization/dashboarding solution to create real-time views to monitor process and asset performance.

► SOLUTION

Deployment Strategy

After evaluating the various options for licensing and deploying the Canary System, Murphy Oil decided that the Canary Cloud Service was their preferred method. The Canary Cloud Service delivers a fully installed Canary System Historian hosted on Azure cloud infrastructure for a small one-time setup charge and an ongoing monthly subscription fee. The subscription includes standard Canary customer service & support.

Process

The process began with the collection of real-time data from across various Murphy Oil regions and business units through the deployment of localized Canary Data Collectors. The collected data is passed to the Canary Store & Forward service where it is secured and encrypted prior to being forwarded to the Canary Historian, where it is consolidated, compressed, and stored. If the connection to the Canary Historian is lost, the Store & Forward service buffers the data locally to prevent data loss. The collected data is then transformed by a set of defined rules to create Canary Views.

Canary Views provides users with virtualized views of the data with easy-to-understand names and a well-defined asset hierarchy that enables users to easily browse and navigate the View data. Axiom is Canary’s web-based data visualization tool that enables users to create graphical real-time dashboards and scheduled reports based on data and assets defined by the selected Views.

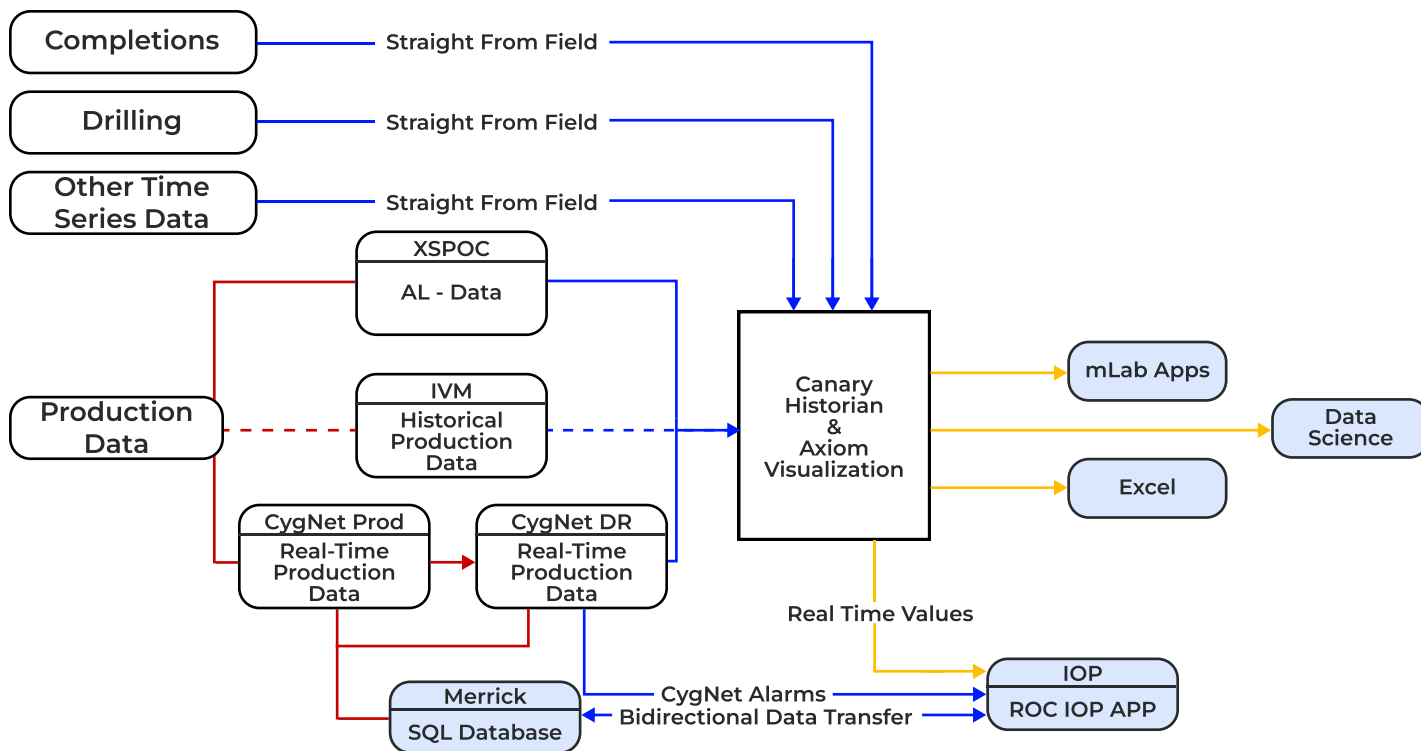
Implementation

The Murphy team decided to launch the Canary System at their Eagle Ford Shale operations and then subsequently implement it at their Canadian business unit. Thomas Nix, SCADA Analyst at Murphy said:

“ As Murphy becomes more data-driven, Canary's tool will grow as a vital necessity. Axiom is a big part of our vision. ”

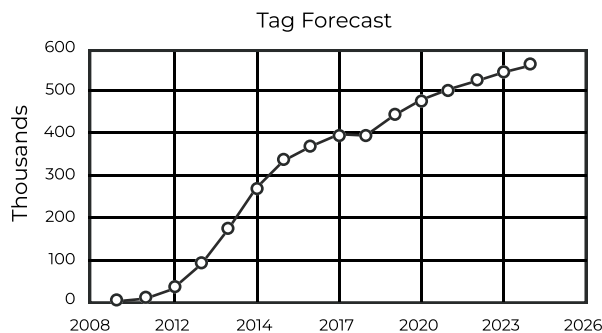
THOMAS NIX
SCADA ANALYST
MURPHY OIL

“The goal is to populate the tool throughout the rest of the business units. As Murphy becomes more data-driven, Canary's tool will grow as a vital necessity. Axiom is a big part of our vision.”



More than 100,000 tags were created during the initial project phase, the majority of which were pulled from their CygNet SCADA system that manages well pads and facilities data. This was followed by 50,000 tags from the XSPOC SCADA system that manages the rod pumps. The Montney asset in the Canada business unit was integrated next under the same nomenclature to adhere to a global standard.

With a growing well count, the tag count is forecast to surpass a half-million by 2025 solely from the company's Eagle Ford Shale CygNet supervisory control and data acquisition (SCADA) system. The implementation has provided Murphy Oil with a complete real-time picture of their operations. The collected data is easily manipulated by users through Axiom's easy-to-configure web-based dashboards.



The Canary System has empowered operators, engineers, and managers to improve their processes, increase quality, and enhance operational efficiency. The insights provided by the Canary System are continuing to shape the future of operations at the company.

▶ VALUE

Quick Time to Value

Francisco Ruiz, Offshore Facilities and Maintenance Team lead at Murphy, said, “Our people are receptive to new ways to improve workflows using new technology. They want to keep challenging themselves and staying ahead of the curve. They quickly realized the value of the tool and are now driving the initiative. The live data can be manipulated easily to visualizations/dashboards within minutes and deployed with a URL”

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FRANCISCO RUIZ
OFFSHORE FACILITIES & MAINTENANCE
MURPHY OIL

Ease of Use

The simplicity and ease of use of the Canary System is helping to generate an increasing amount of relevant data at Murphy.

Tyson Trail, Montney production engineer at Murphy, said the tool revolutionizes data accessibility and storage. “We’re no longer handcuffed by the software we use,” he said. “The more we use Axiom, the more we’re discovering advantages. The sky is the limit for our possibilities.”

Easy Onboarding

It is easy to onboard new users, even those with little or no previous technical knowledge through Canary’s free just-in-time training and the Canary Academy courses. This is essential in today’s fluid employment environment.

Reliability of Service

We have found the Canary Cloud Service to be robust and reliable in providing high performance with around the clock service and minimal administration.

Easy Analysis

Beyond its function as a global data historian, Canary is connected to Axiom, a data analysis tool. The raw data that is pulled into the database is quickly aggregated and transformed into visuals for the purpose of analyzing trends and assessing performance. The functionality of the Axiom visualization tool exceeds that of traditional software.

“The more we use Axiom, the more we’re discovering advantages. The sky is the limit for our possibilities!”

TYSON TRAIL
PRODUCTION ENGINEER
MURPHY OIL

Multiple values associated with each of Murphy’s well assets are connected through charts, graphs, and diagrams replicating the flow of facilities, all of which provide a critical snapshot of well performance. On the basis of the high-frequency data, Murphy can identify and monitor multiple trends instantly.

Ruiz said, "Axiom standardizes how we visualize data. We can now visualize any value—whether it is pressure, temperature, oil level, water level, battery voltage, or running status on any piece of equipment or facility. Our end users have access to all of the data in a simple, easy manner, which motivates them to be proactive in utilizing the program."

Additional trending capabilities allow the overlaying of multiple data streams to spot anomalies easily as well as export data for later analysis. Trends can be compared with their previous historical values or calculated for future possibilities. And, with the touch of a finger, users can view more detailed attributes at a specified location across a trend area. Thus, people are equipped with a big-picture perspective as well as the ability to narrow in and pinpoint any small blip in performance.

Self Service Displays

A game-changing feature for Murphy personnel is the ability to create unique custom dashboards. Users can build from templates, manipulating visuals so the data is presented according to their team's needs and preferences. Nix said, "The intuitive drag-and-drop design provides freedom, particularly for engineers. *Engineers can create their own reports targeting specifically what they want and how they want to see it,*" he said. "They no longer have to wait on the drilling teams or SCADA department to make it happen."

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Users have the flexibility of designating privacy levels for their custom visuals. Applications may be saved in private user folders or made available in public folders that can be shared with others across the company, including annotations on trends that are visible to all. Whether private or public, the data remains agile with the end users. While some people access their data on desktops, others in the field modify and deliver content from their mobile devices. The data is available for analysis anywhere, at any time, thanks in part to the information technology department working with Canary to host the server on Azure and integrating single sign-on.

Open Integration

For more advanced users, the Canary Web API is easily accessible via Python/R scripts, which allows for advanced artificial intelligence (AI) and machine learning (ML) applications, along with integrating other solutions that can sit on top of the Web API.

"Having AI/ML running in the background assisting with the optimization of wells and central facilities, such as Murphy's experimentation with EOR [enhanced oil recovery], provides our engineers time for finding more innovative solutions to produce more oil," Nix said.



James Robertson, a production optimization technician with Murphy Oil, monitors Axiom, the company's global data historian visualization tool.

► SUCCESS

Increased Efficiency

Ultimately, the goal of the deployment of the Canary System is to improve operations. Nix said "The immediate effect has been increased efficiency with the company's time, cash flow, and resources. Our data process that once was monitored by a third party is now handled in-house. Our dashboards that once took months to build and the daily checks on well performance that took hours to complete now only take minutes. Information is getting into the hands of engineers as quickly as possible."

“ You wouldn't think navigation buttons could have such an impact on our time, but, when you're looking at 360 wells, it gets cumbersome. The small things make a big difference in our ability to quickly assess performance. ”

KATY ARNST
LIFT ENGINEER
MURPHY OIL

Time Savings

Katy Arnst, an artificial lift engineer at Murphy, said "The success of the big data strategy is in the details. The endless clicking to look at each well has been streamlined to just one click in Canary. You wouldn't think navigation buttons could have such an impact on our time, but, when you're looking at 360 wells, it gets cumbersome. The small things make a big difference in our ability to quickly assess performance."

Increased user efficiency allows Murphy to concentrate its efforts on optimizing well performance. Axiom takes away the noise of thousands of field measurements, distilling the information to only the factors that users are targeting at that moment. Without the limitations of traditional software with prebuilt trends, Axiom allows them to consider new combinations of factors and to examine broader trends. This new representation of data introduces new possibilities and solutions.

“ I have been able to substantially reduce the time it takes me to review through each of the facilities and ask the engineers and operations the right questions. This tool has empowered our field personnel to also engage our engineers in more meaningful discussions for optimization. ”

KAREY KNACKSTEDT
FACILITIES TEAM LEADER
MURPHY OIL

Operational Insights

This is precisely how Axiom won over Karey Knackstedt, the Facilities Team Lead. Knackstedt said, "As facilities lead, every morning I need to be aware of what's happening in more than 30 central facilities that we are operating. I had a very specific request on how I wanted to visualize the operations. We were able to deploy a very customized dashboard in a couple of weeks. Trend lines can convey the whole story for the past 24 hours or trends over the past 6 months as opposed to a single point displayed by value boxes.

With the ability to quickly trend any of the parameters displayed, I have been able to substantially reduce the time it takes me to review through each of the facilities and ask the engineers and operations the right questions. This tool has empowered our field personnel to also engage our engineers in more meaningful discussions for optimization.”

Data Driven Decisions

The clarity and insight are helping engineers and operators make confident, data-driven decisions. They no longer discuss speculations and lagging parameters. Today, they are leveraging the visibility of real-time data and trends from facilities, looking for critical leading indicators to determine root causes, discern patterns, and make rapid adjustments for the prevention of issues.



As a result, Murphy is producing optimal outcomes, including setting realistic production goals, maximizing uptime, and ensuring safety.

Ongoing Improvement

In 2019, Murphy embarked on a new initiative to integrate the entire real-time 1-second drilling and completion data into the Canary Historian. This was a monumental challenge, not only because of the sheer quantity of data but also because of the need to normalize historical data from various vendors. For example, completion data contained more than 1,500 unique tag names. By using Canary Views, these tags have been normalized to just over 90 unique virtual tags.

“ We've progressed from relying on data gurus to normalizing the data and equipping data users in an approachable way, it's causing a thirst for more, faster, real-time data. The journey is exciting and there's more to come as we zero in on our most critical information. ”

ERIC HAMBLY
EXECUTIVE VICE PRESIDENT
NORTH AMERICAN ONSHORE OPERATIONS
MURPHY OIL

► RECOMMENDATION

Don't be overwhelmed by Industry 4.0, the Industrial Internet of Things (IIOT), or all the technical jargon that goes with it. Just get started on laying your foundation with the Canary System. Everything starts with the collection, storage, transformation, analysis, and visualization of real-time data and operational insights. Reach out to Canary who can help you get started on your own digital journey today.

"This is a collaborative effort in which the technology side of operations and the business side of operations come together to work effectively. We truly have the power of data in our hands now."

Benny Singh
MANAGER OF DATA ANALYTIC AND SOLUTIONS
MURPHY OIL

ABOUT CANARY

Founded in 1985 with a focus to develop solutions from the end user's perspective, we have achieved more than 20,000 installations in over 70 countries. Our clients represent private, public, and government entities in all major industries.

HELPFUL LINKS

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