

Oil Company – IoT Predictive Maintenance



Client: The customer, a global oil company was using an historian product to collect and store critical data on their system. Any interruption of service was causing millions of dollars in lost revenue.

Other industries have been using AI and deep learning successfully for predictive maintenance so for the customer it was unacceptable to not take advantage of these new technologies and capabilities.

Challenges:

- Lack of talent & Big Data expertise
- Complex and dedicated solution
- Must be running 24/7
- Map the full eco-system
- Extremely large number of sensors, most with dedicated outdated drivers
- Need self-service data pipeline for the data-science team

Solution:

For this project, CaliStream's team worked with a large diversity of domain's experts. Together, the team built a specialized set of adaptors to forward the data collected by the historian solution.

Then, specific ones, to collect new data sources, as well as most of the telemetry data, **enabling long-term and deep learning analysis on data stored at a very high frequency.**

Benefits:

With all the data easily accessible for the first time in a single data-warehouse, the team was **able to detect early signs of turbine failures, saving millions in potential lost of revenues.**

The key benefits were:

- Big Data expertise and Time to market
- Ability to collect Billion of events in real-time and worldwide
- Automatic schema management
- Self-Service data collection pipeline
- Native Spark/Hive integration
- AI/Deep learning knowledge

A global oil company, using a traditional historian solution was researching ways to finally take advantage of **machine-learning and deep learning for predictive maintenance.**

The first failure that they wanted to predict was for their turbines. An expensive piece of hardware, which when failing was stopping the production. Instead they'd like to change them on a planned and scheduled timeline but not too early because of the high price tag.

However, even with already a massive volume of data available in the historian database, previous attempts at predicting failures were unsuccessful.

For this project, CaliStream's team worked with a large diversity of domain's experts. Very quickly it appears that the company was only collecting data from hardware or actionable. In addition, the data contained in the historian database was stored at a relatively low frequency.

Additionally, a very large number of sensors data (vibrations, rpms, temperature, etc.) was collected by another system for monitoring purpose only. Unfortunately, the raw data was collected at a low frequency and dropped after only 10 days, keeping only a down sampling version for up to just 3 months.

These conditions allowed equipment maintenance problems to go undetected until the critical failure.

Thanks to CaliStream's scalable data pipeline and free form event's schema SDK, the team quickly built a set of specialized adaptors to collect at a very high frequency, store and organize all the data in a single source of truth.

CaliStream provides a SaaS data processing pipeline to easily stream large volume of events from your applications directly to Spark, Hive, Hadoop.





Other related IoT projects:

THALES

“CaliStream and their team of big data experts provided us deep architectural knowledge while implementing a data pipeline solution, which greatly enhanced our project’s time line and ultimate time to market.”

Bringing CaliStream and their team of big data experts into our project allowed us to focus on creating value from our domain expertise.”

David CAVALLARO
Sr Thales xPlor Manager

WEFT™

“Thanks to CaliStream Saas solution and expertise. We’ve been able to gain a strategic Big Data advantage by focusing on our domain expertise rather than infrastructure.”

Marc Held
CEO Weft.io

ODYN

“By leveraging CaliStream Saas solution and expertise, we can focus on our core domain of expertise and dedicate our resources where it matters.”

Marc Held
CEO ODYN.AI

Thanks to Domain’s Experts (external to the Oil company), CaliStream’s expertise in Big Data, AI & deep learning and CaliStream’s ability to very quickly ingest new data sources at a very high frequency, **In just over 4 months, the team delivered a new Big Data solution able to train models and detect early signs of turbine failures, enabling the customer to schedule repairs during planned maintenance windows, saving millions in potential lost of revenues.**

Building on this initial early success, the project has been transitioned back to the oil company, under a new team in charge of their digital transformation, while CaliStream’s team continue to provide the core data pipeline, as well as advising their teams on all big data and distributed systems related topics.

Over the course of this project, CaliStream enhance his IoT Gateway to add forwarding capabilities from many industrial automation solutions like OSIsoft, Kepware, Inductive Automation and others.

