Smart Manufacturing

Spectra Symbol leverages Altizon's IoT Platform for Remote Asset Monitoring Solutions

Smart Manufacturing

Remote Asset Monitoring

Oil & Gas

Spectra Symbol, a 39 years old US based firm, is a leading provider of sensor hardware and IoT solutions focusing largely on the oil and gas industry. They were looking for a data connectivity and analytics partner to connect their hardware and provide analytics for the data that they and their customers gathered.

Altizon with Datonis®– its Industrial IoT Platform helped Spectra provide connectivity for its various sensors. We created a single platform for data storage and analysis in real time, both for Spectra and its customers.

Altizon's Kodiak oil monitoring application automated the monitoring of tank levels at remote oil wells, using wireless sensors and 3G enabled gateways to stream data which could then be analyzed to:

- Enable Real-time **Asset Monitoring**,
- Improve **Asset Utilization**,
- Set **Condition and Sabotage Monitoring**,
- Optimize **Energy Monitoring and Management**,
- Improve **Operational Efficiency**,
- Implement **Predictive maintenance** & **Anomaly Detection** using Machine Learning & Analytics and
- Control costs and improve productivity with a **payback period of fewer than 12 months**.

SECTOR

Smart Manufacturing | Oil Well Remote Monitoring System

CUSTOMER PROFILE

A leading US based Sensor Manufacturer, **Spectra Symbol** produces one of the best linear sensors and potentiometers. They've been designing, building, manufacturing sensors and a lot of medical devices. For more than 30 years now, they've been developing the Membrane Sensor technology through multiple patents and innovative applications, serving medical instrumentation, aerospace, military, automotive, industrial controls and position sensing markets.

BUSINESS REQUIREMENTS

- Spectra Symbol needed to connect a variety of their sensors (namely Level and Angular rotation sensors, Temperature, Accelerometers and Strain Sensors) and enable automated rule-based remote monitoring of the data received about operational parameters.
- While the **Kodiak application** was domain specific for oil well monitoring, a new application was needed to connect different sensors such as temperature and strain sensors with simple rules being enabled on top of the data.
- **Smartsensys**, one of Spectra's customers needed to monitor the structural health of bridges through sensor data.

THE CHALLENGE

Today the two major challenges faced by Oil & Gas CIOs are cost containment pressures and connectivity issues with remote oil wells. Particularly Spectra Symbol faced the following challenges:

- **Need for continued Cost Optimization**

  Their target was to leverage technology to economically extend the useful lives of stripper wells or marginal wells. Given the production volumes are not high, one of the biggest issues is that the wells don't produce enough to be worth a huge investment in sensors. Hence the costs need to be brought down.

- **Remote Oil Wells with No Connectivity**

  Secondly, these wells are remote. They have no power or internet connectivity and are difficult to get to.

- **Costly Hardware Installation**

  Thirdly, not only do the sensors cost a lot but the installation also costs a lot adding 60% to the cost of the original sensor. Further, the software programs that have to be built can cost 100 thousand dollars to build. For smaller operations and more remote end-of-life wells, fast ROI was of the essence to justify the IoT Implementation.

SOLUTION

Altizon determined their IoT integration requirements and filled in their technology gap with **Datonis®**, a scalable cloud-based Industrial IoT Platform by Altizon.

As a process, across remote oil wells, when oil and water are being pumped into the tanks, the level of oil and water needs to be measured. Also, the activity of the pumps needs to be monitored. A 20-foot sensor measures both the oil and water. At this stage, all the data is connected back through the cellular network to the cloud through Altizon's IoT platform. After streaming the data to the platform, it was adjusted, analyzed and displayed on an Integrated Dashboard. In line with the business requirements, Altizon developed two phases of oil and gas applications for Spectra Symbol's Oil well monitoring solution:

- **Kodiak Application**
  This solution automates the monitoring of tank levels at remote oil wells. It uses wireless sensors and a 3G network-enabled gateway to stream data to Datonis®. This data is then available for analysis in the Kodiak oil monitoring application. The users can also set automated alerts based on tank levels and temperature. Two of Spectra's customers, Wold and IWM, are already using this application.

- **Generalized sensor data application**
  This is a second application developed for Spectra. It was built specifically for use with their temperature sensors. We are now extending it to be used with their accelerometers and strain sensors as well. Unlike Kodiak, this is a more generalized application that we intend to extend to support the various sensors deployed by Spectra Symbol. It will also feature a subset of the dynamic widgets that can be seen at www.datonis.io

- **Smartsenys Proprietary Application**
  An extension of the application developed was for Spectra to focus on the monitoring the load factor of bridges. They are customers of Spectra and will be using their sensor hardware and wireless gateways. We will be providing them with an application bearing no references to Spectra. **They will, themselves be an OEM customer for us**. Their own customers will be given individual logins for this app, and in turn for Datonis®.

OUTCOMES

With Altizon's IoT Platform, Spectra Symbol was able to transform their existing business processes. Some of the business outcomes of deploying Datonis® platform are:

- **Real-time Asset Monitoring**
  With real-time Asset Monitoring, Spectra was able to automate monitoring and analysis of data. Through customized views of available data, visualization of data was simpler enabling better decision making. Timelines allowed processes to be tracked over time. Specific areas of interest could be viewed in greater detail by zooming in. Real-time analysis of failure events was utilized to determine causes and conditions of failure.

- **Improved Asset Utilization**
  Improved Asset Utilization enabled control of process parameters, such as temperature variations due to the time of day for which no data was previously available. Assets were prevented from operating beyond threshold limits and at sub-optimal levels, increasing throughput and reducing operating expenses. Thus inventory costs were also reduced. OEE (Overall Equipment Effectiveness), OPE (Overall Process Effectiveness), Production Variance, Accurate Idle time pockets & Reasoning could now be monitored at the cell, machine and/or plant levels in near real time.

- **Condition and Sabotage Monitoring**
  Condition-based Monitoring greatly reduced the cost of asset maintenance. Greater dependability reduced the amount of spare parts inventory required to be maintained. Asset life was significantly increased.

- **Energy Monitoring and Management**

  Through Energy Monitoring and Management, inefficiencies were tracked and controlled. Real-time monitoring of critical energy parameters was carried out. The cost of energy was optimized. Energy and utility losses were reduced and the quality of available energy was increased.

- **Improved Operational Efficiency**

  Greater Operational Efficiency enabled better asset utilization. This increased the Return on Asset (ROA) Investment. Asset planning was improved. Better negotiation of contractor SLAs was possible.

- **Predictive Maintenance & Anomaly Detection**

  Anomaly detection meant failures could be predicted and optimal process parameters could be determined. Costs of downtime losses were reduced. Quality and predictability of assets were increased through predictive maintenance.

ROADMAP AHEAD

Future functionalities on the current applications:

1. Our platform supports condition based monitoring of continuous time series data. This data will be used to automate responses based on complex statistical rules. Data from multiple sensors working together and bearing the same time stamp will further predict anomalies, determine causation and reveal correlations using **Advanced Analytics**.

2. Sensors not connected to any industrial automation systems and independent in an installation such as accelerometers, vibration sensors, temperature and humidity sensors are critical in terms of determining or having an impact on maintenance, quality, stability and reliability. These sensors will be connected and prioritized with sensors for additional Remote Monitoring Applications.

3. Augmenting the value provided, we will also help develop new Business Models for Spectra. Spectra symbol will be able to provide value to its customers by enabling:

   - **Sensor-as-a-product with remote monitoring as a feature. This will allow:**
     - Remote monitoring as to be offered as an extended feature.
     - Utilization based on customer needs.
     - Increase in upsell value and generate more revenue per customer.

   - **Sensing application as a service. For instance, structural health monitoring or remote oil monitoring as an end to end service. Spectra can develop:**
     - End to end service with SLAs based on value.
     - Incentives and penalties based on actual impact and value delivered.
     - New revenue streams with continuous improvement and uses advanced statistics as an incentive to reduce costs and improve operations, benefitting all parties involved.

ABOUT ALTIZON

Recognized as Gartner 2015 Cool Vendor , Altizon is the world's first Industrial Internet Platform company focussed on making Enterprises Internet of Things(IoT) ready.

Our flagship product - the Datonis IoT Platform, helps you build your IoT product in weeks by providing device connectivity kits, a device management layer, a highly-scalable, real-time, big-data analytics engine and alerting and monitoring services.

Datonis easily integrates with your existing IT systems to provide a seamless transition between your IoT devices and your IT infrastructure management tools. Datonis is available both in a SaaS as well as in a Hosted model.

We help you build your smart connected devices with the

- **Most Comprehensive Support for Industry 4.0**
- **Industry leading Stream Analytics and Event Rule Engines**
- **Best DIY Enterprise Dashboards**
- **Go Mobile, Go Cloud solutions**
- **Enterprise grade Scalability and Security**

CONNECT EVERYTHING

Connect Seamlessly
Collect & Transfer Data Securely
Manage Devices

OWN YOUR DATA

Create visualizations
Build applications using API'S
LOB Integration

PROCESS EVERYTHING

Define structure
Generate alerts & notifications
Store data securely

DEPLOY ANYWHERE

SaaS model
Cloud hosting & support
Private cloud/On-premise

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