**Oil Well Sensor Data WA Demo Script**

**Demo Summary:**

Focusing on the Industrial Market, this demo will show the value of using IBM analytics to reduce downtime, manage costs, and improve efficiencies in a production environment.

This demo shows how smarter self-service using WA can turn IoT data into signals and actionable insights. When an analyst must extract Sensor data from sensors in Oil Wells to understand the signals that could stop the production of oil.

The Analyst uses IoT data streamed into a dataset, then uses Watson Analytics to generate insights to maintain the flow of oil.

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Setup:

* Copy and upload Oil\_Well\_Sensor\_Data.xlsx from your desktop into WA

INTRO:

Hello, my name is John Scialdone and I am a Technical Specialist with IBM’s Business Analytics portfolio supporting the Industrial Market.

Today we will be talking about Smarter self-service analytics.

In today’s world, we expect people to make data driven decisions, yet many people don’t have the right skills to be self-sufficient to not rely on others. Organizations have analytic users with varying skill sets and needs, and it takes a comprehensive approach to analytics to satisfy that large variety of users.  This is where IBM Analytics portfolio really shines.

Today, we will be demonstrating a Smarter self-service analytics solution from Watson Analytics.

So, let’s setup today’s demonstration.

When most people think of analytics, they typically think about Analytics for Sales, Marketing, and Finance areas. That is true. However, analytics for the Production and Supply Chain processes are just as important and have an impact on an organization’s bottom line and performance.

For today’s demonstration, I will take on the persona of an Operations Analyst who works for an Oil & Gas company. My daily routine is to monitor the operations of our oil wells. I start by looking at a daily dashboard with metrics such as flow rates, PSI, temperature. Our sensors do alert us to potential issues when readings are within certain thresh-holds. However, we still conduct daily analysis of our sensor readings as a precaution for safety reasons.

Today, I pull in a Sensor Reading data set from a few of our Oil Wells.

**Watson Analytics Demo**

**Launch Watson Analytics**

* **Story:** Before we start our Discovery journey, we need to upload our Oil Well Sensor data file.
  + Select the “+ New Data” button
  + Select the Local File icon
  + Select the Browse button
  + Select the “Oil\_Well\_Sensor\_Data.xlsx”
  + Click the Import button
* **Story:** Explain what happens during a file upload process:

Explain how WA evaluates the file to understand relationships between the values within the columns

and rows and starts to learn and generate potential insights and explain the file score.

* + Click on the “Oil\_Well\_Sensor\_Data” file to open a new Discovery Set.
* **Story:** Watson Analytics automatically suggests 10 Starting Points based on what it “learned” from the data load.
  + “What is the trend of flow rate by timestamp and well id”
* **Story:** Right away I can tell the flow rate is averaging just between .5 & .7. However, there are a few dips in the flow rate that I would like to investigate further. So, let’s dig a little deeper and look at the readings from each of sensors.
  + Replace “Well\_ID” with “Sensor\_ID”
* **Story:** The visual now shows a more detailed chart. I can now see the readings for each sensor and I can now tell which sensors are indicating the low Flow Rates. It looks like DW001/WH001 as well as DW002/WH002 and DW003
  + Rename the tab “Flow Rate by Sensor”
  + Click on + for a new tab
* **Story:** Now, I want to see if the Low Flow rates are associated with Temperature or PSI.
  + Type:
    - “What is the relationship between Flow Rate and Temperature by Timestamp?”
    - Select “What is the relationship between Flow Rate and Temperature by timestamp”
    - Add Sensor\_ID to Color
* **Story:** I immediately see there is a correlation between the low Flow Rate and Higher Temps outside the norm for Sensors AK\_PB001a\_DW001/WH001, and Senor AK\_PB001b\_DW003 seems to be indicating almost zero readings for both Temperature and Flow Rate. Now let’s see about the relationship to PSI as well.
  + Replace “Temperature” with “PSI”
* **Story:** I immediately see there is a correlation between the low Flow Rate and Higher PSI outside the norm for Sensors AK\_PB001a\_DW001/WH001, as well as for Sensors AK\_PB001b\_DW002/WH002. But again, Sensor AK\_PB001b\_DW003 seems to be indicating almost zero readings for both PSI and Flow Rate.
* It seems for Well AK\_PB001a, the Higher Temp and PSI readings together with a very low Flow Rate could indicate a full blockage within the Well, that could cause an explosion from the buildup. I need to dispatch a team to check out the Well and ensure it is safe.
* For Well AK\_PB001b, Sensors AK\_PB001b\_DW002/WH002 are indicating high PSI, but the Temperature and the Flow Rate are low. This could indicate a partial blockage that could worsen. So, I will also dispatch a team to look at Well AK\_PB001b.
* As for the very low readings on Sensor AK\_PB001b\_DW003 for all metrics, seems there could be a faulty Sensor needing to be replaced. So, while the team is looking at the partial blockage indicator, they can examine the sensor and replace if needed.
* I can continue to ask about each metric, but to be truly unbiased, what if WA could tell me what may influence Flow Rate. Just like the Starting points on the main page, WA also offers suggestions based on the visualization displayed in the main area.
  + In the Discoveries Panel on the right, Select “Top Drivers of Flow\_Rate”
* **Story:** Through its cognitive learning based on the data, WA can give me the top drivers of Flow Rate. The spiral chart tells me the closer to the center of the target the more influence an attribute has on Flow Rate.
  + Highlight the different drivers from the Drivers list.
* **Story:** WA can select the most influential drivers of Flow Rate based on the learning from the data set and the relationships between the values of each cell in each row and column. Providing me with a more accurate picture of the signals that drive the Flow Rate in the Wells.
  + Rename the Spiral tab to “Drivers of Flow Rate”.
* **Story:** It’s usually more than one Driver or pattern of events that influences an outcome. WA can show us patterns or behaviors that can derive Flow Rates with Its predictive capabilities. This Decision Rules / Tree diagram will show me patterns of events that will Drive Different Flow Rates.
  + Click the Decision Tree chart from the “Discoveries section” then change Predicting to “Yes”
* **Story:** You can see from these many Drivers and specific values or Range of values how the influence Flow Rate
  + Click on Decision Rules / Tree and walk through the different patterns.
* **Story:** Without WA, I think it would be nearly impossible to look at a file with hundreds of columns and thousands of rows of data and determine what sequence of events and patterns that can result in a specific outcome. WA can tell me this in minutes.
  + Rename the Decision tree tab to “Patterns of Flow Rate”.
* **Story:** I feel very confident in what I have discovered today. Now, I can dispatch our teams to the Wells and have them look in to the specific metrics we discovered today. Especially the blockage and partial blockage indicators and make any repairs or adjustments needed to keep the Oil safely flowing through the Wells. Minimizing any chance of downtime or worse an accident. We may also be able to adjust our Sensor Alert Thresh holds based on the signals identified in within our analysis from WA.
  + Save the Discovery Set as “Oil Well Sensor Analysis”
* **Story:** Now that I have generated some valuable insight about Oil well data, I can use Watson Analytics to generate a dashboard to share with team before they head out to the wells.
* Select the Display panel and select “+ New Display” button.
* Select the template with 4 widgets/sections
* **Story:** one of the reasons I renamed the tabs of my Discovery Set is so I can use them as the source of generating my dashboard. Regardless of your skills, if you never created a dashboard or report before. You will be able to with WA.
* Select the new Discovery set
  + Drag Flow Rate by Sensor to top.
  + Drag Flow Rate by PSI & Temperature to bottom.
  + Click + New tab, select one widget template.
  + Drag Drivers of Flow Rate.
  + Click + New tab, select one widget template.
  + Drag in the Signals of Flow Rate.
* Select Save As “Flow Rate Dashboard”.
* Now, I have a great way for the technical team to view the valuable insights WA provided for me regarding Flow rates in the Oil Wells. They will have the moat accurate information at hand while they are dispatched to evaluate the two wells.

That is the end of my demo. I hope I could demonstrate the value of Smarter self-service analytics and how IBM makes it easy for everyone to use analytics in their daily tasks. Together, we can improve efficiencies in your production process, cost savings, and impact to the bottom line.

Thanks

John