

Best Practices for Making Advanced Analytics Relevant

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OSIsoft

Workbench for Relevant Operational Analytics

Data Engineering and Preparation

- PI System offers distinctive features for preparing time-series data for advanced analytics, e.g. asset context, process context and feature generation.

Access, Analysis and Model Enablement

- PI System provides multiple data access methods, meeting needs of data engineers or scientists.

Testing, Evaluation and Operationalization

- Asset Analytics plays an essential role in testing and evaluating developed models.
- PI Vision and Future Data support model integration and socialization for gaining relevance within Operations.

Accountability

- PI System provides verification of improvement benefits

Data Engineering and Preparation

Real Time Data is Different

- Transactional data is recorded in a tabular format with values associated by columns in each row.
- Real-time data is recorded with only time context, i.e. value and timestamp.
- Full-featured “observations” are required for analytics.

	A _C leakno	A _C compute_0002	A _C city	A _C grade	A _C read_locat	A _C map	A _C plat	A _C block	A _C date_reptd
1	7800201621	00201621	San Jose	3	Under Drway o/m	3411	F07	040	11/28/2000 14:00:00
2	7801200081	01200081	Santa Clara	3	o/m in s/e cor of Humbolt Ave	3411	B08	010	1/5/2001 11:00:00
3	7801200091	01200091	Santa Clara	3	o/m 2' into property	3411	D06	028	1/4/2001 01:30:00
4	7801200121	01200121	Santa Clara	2	o/m, 3' from sidewalk	3411	D06	012	1/16/2001 10:00:00
5	7801200841	01200841	Santa Clara	3	1% o/m under concrete pkstrip at e/end of drway	3411	A07	028	8/27/2001 11:00:00
6	7801200851	01200851	Santa Clara	3	1% under drway at curb & Gutter	3411	A08	015	8/28/2001 10:00:00
7	7803200121	03200121	San Jose	3	1575 Parkveiw Ave.	3411	H07	044	3/23/2003 09:48:00
8	7803200461	03200461	Santa Clara	3	1% in svc tee area o/main	3411	C07	026	11/10/2003 07:33:00
9	7806200241	06200241	Santa Clara	3	s/w cor Princeton Wy x Princeton Ct on main	3411	C07	012	2/6/2006 13:15:00
10	7806200271	06200271	Santa Clara	3	S/E cor Homestead x Lawrence Exwy valve frme&cover	3411	C07	016	2/7/2006 11:40:00
11	7806200351	06200351	Santa Clara	2	O/M @ svc tee (Longside)	3411	C08	037	2/16/2006 10:00:00
12	7806200441	06200441	Santa Clara	3	over main next to srvc tee	3411	D07	048	3/8/2006 13:00:00
13	7806200481	06200481	Santa Clara	2	on main or tee	3411	D08	052	3/10/2006 09:45:00
14	7806200491	06200491	Santa Clara	2	on main ovr sewer not venting to house	3411	D08	053	3/10/2006 10:00:00
15	7806200501	06200501	Santa Clara	2	btwn #s 3145 & 3155 Mauricia Wy on main or tee	3411	D08	008	3/10/2006 11:25:00
16	7806200511	06200511	Santa Clara	3	on tee S/O driveway	3411	D08	056	3/10/2006 14:00:00
17	7806200541	06200541	Santa Clara	3	on tee	3411	D08	049	3/15/2006 13:30:00
18	7806200561	06200561	San Jose	2	ovr main btwn Greendale & Auburn on Albany	3411	E08	014	3/16/2006 13:45:00
19	7806200611	06200611	Santa Clara	3	15' from drway about 15" in parkstrip @svc tee	3411	F07	041	3/22/2006 13:45:00
20	7806200641	06200641	Santa Clara	3	3% OVER MAIN NEXT TO SEWER	3411	G08	012	3/23/2006 14:00:00
21	7806200651	06200651	San Jose	3	on main or srvc tee	3411	F08	072	3/24/2006 11:15:00
22	7806200681	06200681	Santa Clara	2+	5" in parkstrip fr/swk over tee on main 6' from...	3411	G07	006	3/28/2006 13:40:00
23	7806200701	06200701	Santa Clara	3	36" EO W p/l Olympus. 2% in water box	3411	G08	053	3/28/2006 13:00:00
24	7806200711	06200711	Santa Clara	2	F/O o/main (under tree)	3411	H06	023	3/29/2006 11:00:00
25	7806200721	06200721	Santa Clara	2+	o/svc/tee about 3' from drway in parkstrip	3411	G07	014	3/29/2006 13:10:00

56.902 03-SEP-2016 11:23 AM

Prepare Operational Data for Experimentation

- Sensor data unevenly timestamped
- Domain experts supply known relationships and impacting features
- Features and labeled events are added by backfilling in Asset Analytics
- Benefit for Operations and advanced analytics
- Prepared features persist for model operationalization and notification

63.781 3/9/16 11:19 AM

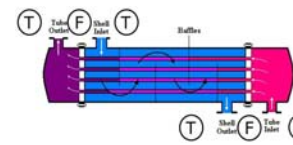


56.902 3/9/16 11:23 AM

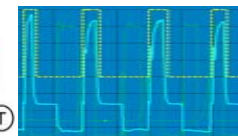


58.341 3/9/16 11:41 AM

Operational
Context



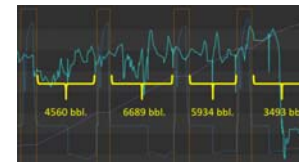
Asset



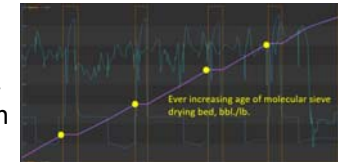
Process Actions

$$H = z + \frac{p}{\rho g} + \frac{v^2}{2g} = h + \frac{v^2}{2g}$$

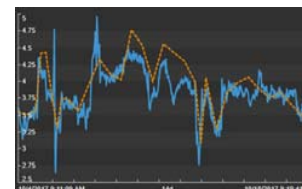
First Principles



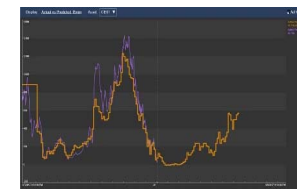
Aggregations &
Experimentation



Operational
Relevance



Predictive Results



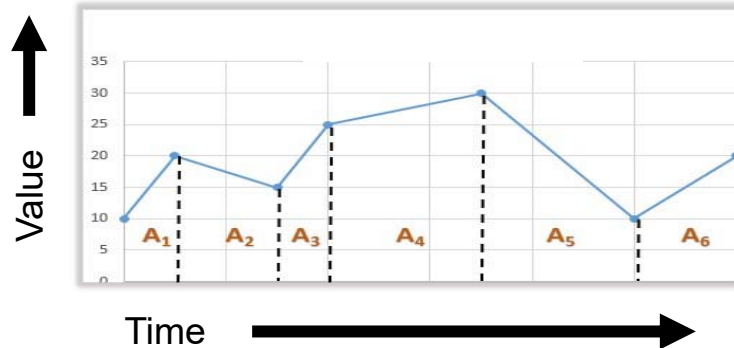
Future Data



Notification

Aggregations and Units of Measure Observance

Unevenly Spaced Events



Correct: Time-weighted

Average = 20.208

Incorrect: Arithmetic

$$\frac{10 + 20 + 15 + 25 + 30 + 10 + 20}{7} = 18.571$$

Measured Rates Converted to Totals

Time Stamp	Value	Units	Gallons
7/5/2017 8:00	8,828.5	gal/d	0.0
7/5/2017 8:20	8,845.1	gal/d	122.8
7/5/2017 8:40	8,861.6	gal/d	123.1
7/5/2017 9:00	8,894.8	gal/d	123.5
7/5/2017 9:20	9,045.2	gal/d	125.6
7/5/2017 9:40	9,171.3	gal/d	127.4
7/5/2017 10:00	9,199.9	gal/d	127.8
	62,846.4		750.2 gal

Correct: Unit Conversion

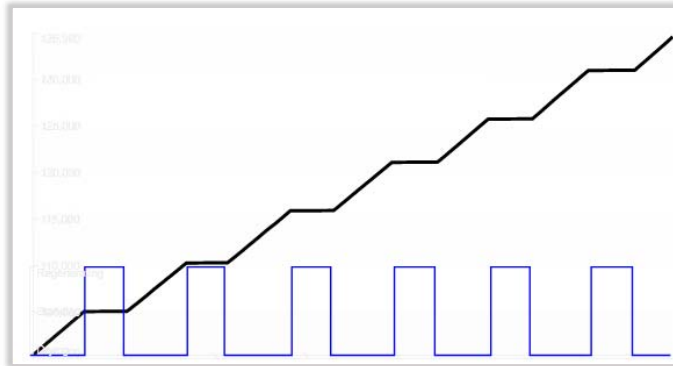
Total = 750.2

Incorrect: Arithmetic

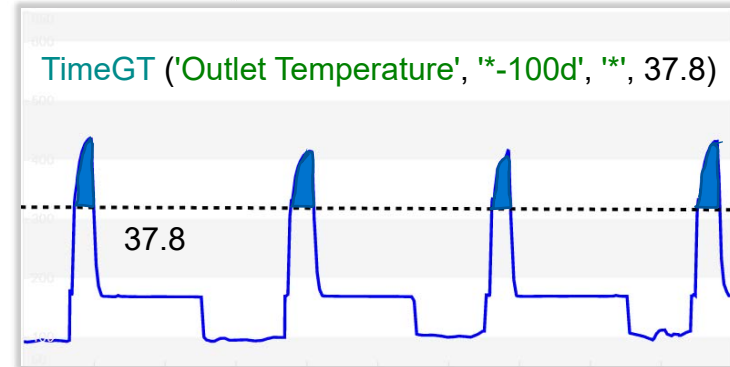
Sum = 62,846.4

Time at State and at Conditions, Dynamics

Asset Runtime



Exposure to Conditions

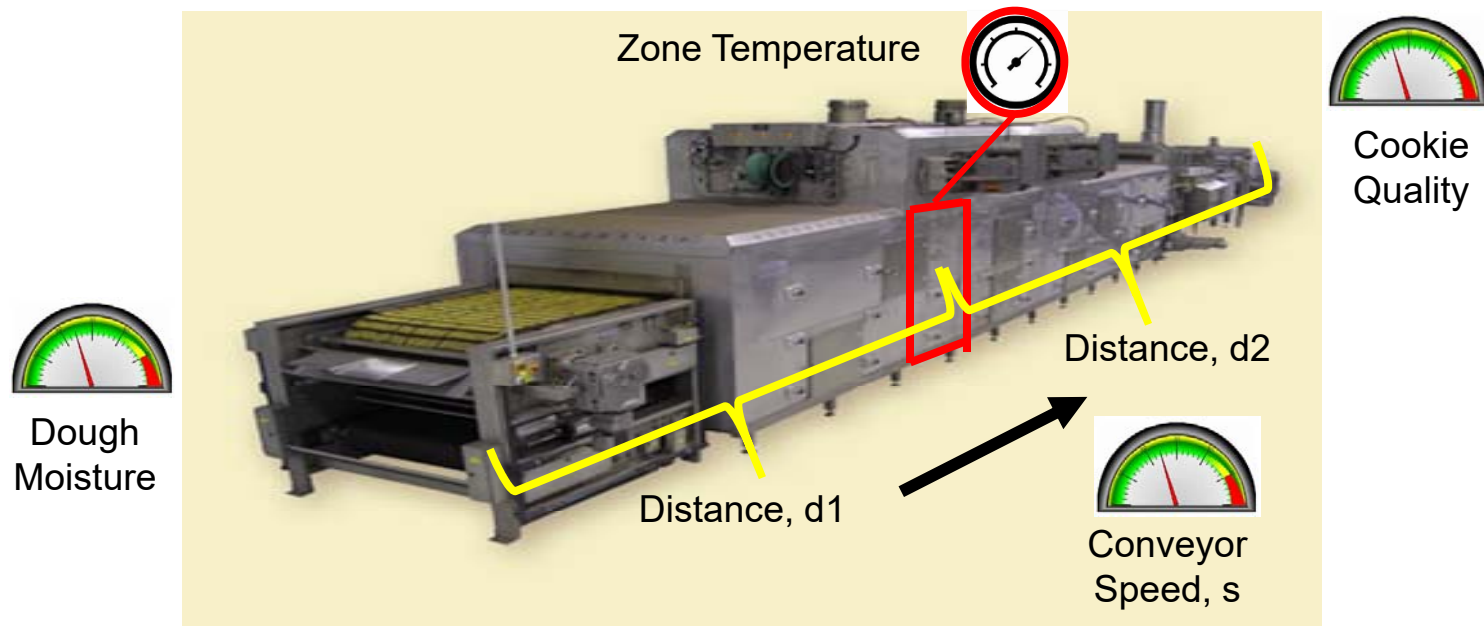


Process Dynamics



15-Mar-20 3:57 AM	Pump 6	75.68	853.4
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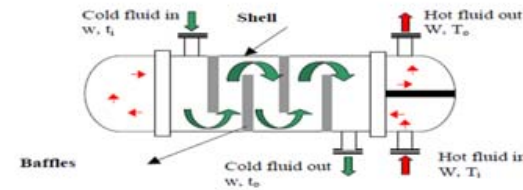
Dynamics: The Way the Cookie Crumbles



Modelling Phase	Moisture	Temperature	Quality
Training Observations	$* - (d1 + d2) / s$	$* - d2 / s$	*
Prediction	*	$* + d1 / s$	$* + (d1 + d2) / s$

First Principles Analytics - Asset Analytics

- *Configure* calculations for **transparency** and **scale**
- Math, statistical, logical and steam table functions
- Predictive algebraic analytics
- Future data for forecasting
- **Backfill ! Backfill ! Backfill !**



Heat Exchanger Key Performance Indicator:

Overall heat transfer coefficient

$$U = \frac{Q}{A \times \text{Corrected LMTD}}$$

**RULE: IF the heat transfer coefficient is decreasing,
THEN the *Heat Exchanger FOULING* !!!
Cleaning is required!**

Elements

- E100
- E239
- E345
- E367
- Element Searches

E100

General Child Elements Attributes Ports Analyses Notification Rules Version

Name: Heat Duty

Description:

Categories:








Analysis Type: ☒ Expression ☐ Rollup ☐ Event Frame Generation ☐ SQC

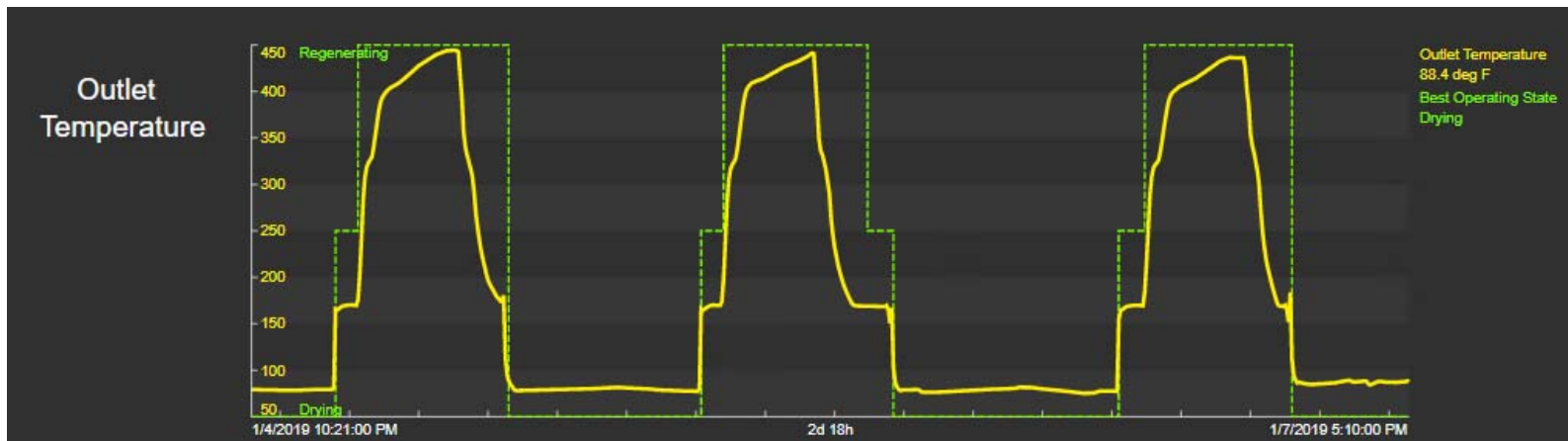
Add a new variable

Name Expression Output Attribute

LMTD $((('Hot Side Inlet Temperature' - 'Cold Side Outlet Temperature') - ('Hot Side Outlet Temperature' - 'Cold Side Inlet Temperature')) / \text{Log}((('Hot Side Inlet Temperature' - 'Cold Side Outlet Temperature') / ('Hot Side Outlet Temperature' - 'Cold Side Inlet Temperature'))))$ LMTD

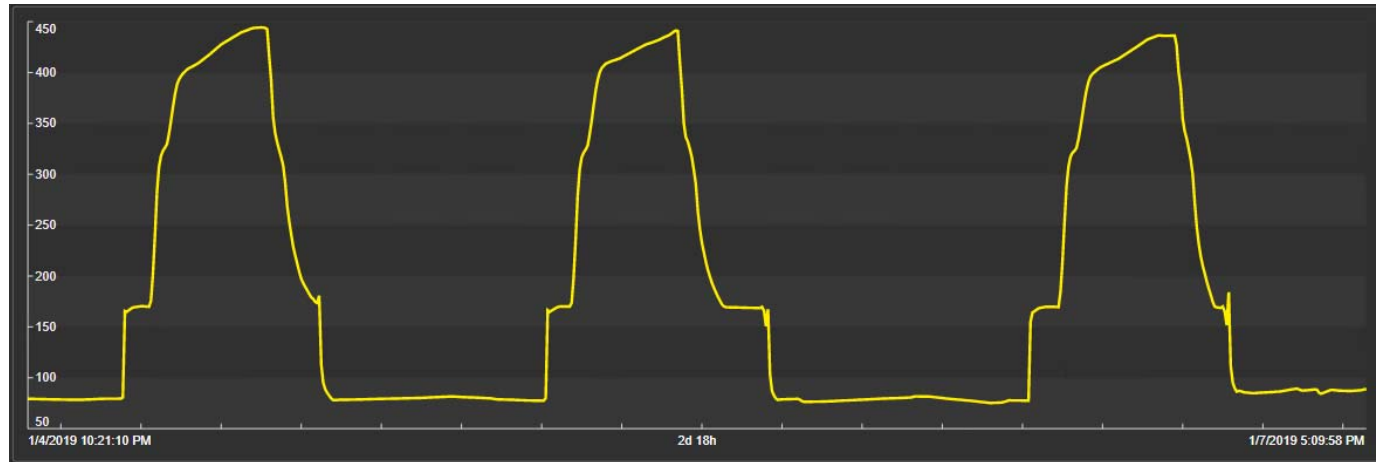
Label Time Ranges of Interest – *Event Frames*

Event Frame Search Results 1				
Filter				
 Name	Duration	Start Time	End Time	
  Dryer A Regeneration Cycle 01-04-19 03:06	9:54:00	1/4/2019 3:06:00 AM	1/4/2019 1:00:00 PM	
  Dryer A Regeneration Cycle 01-05-19 04:30	8:42:00	1/5/2019 4:30:00 AM	1/5/2019 1:12:00 PM	
  Dryer A Regeneration Cycle 01-06-19 01:36	8:18:00	1/6/2019 1:36:00 AM	1/6/2019 9:54:00 AM	



Framing Rule from Outlet Temperature Pattern

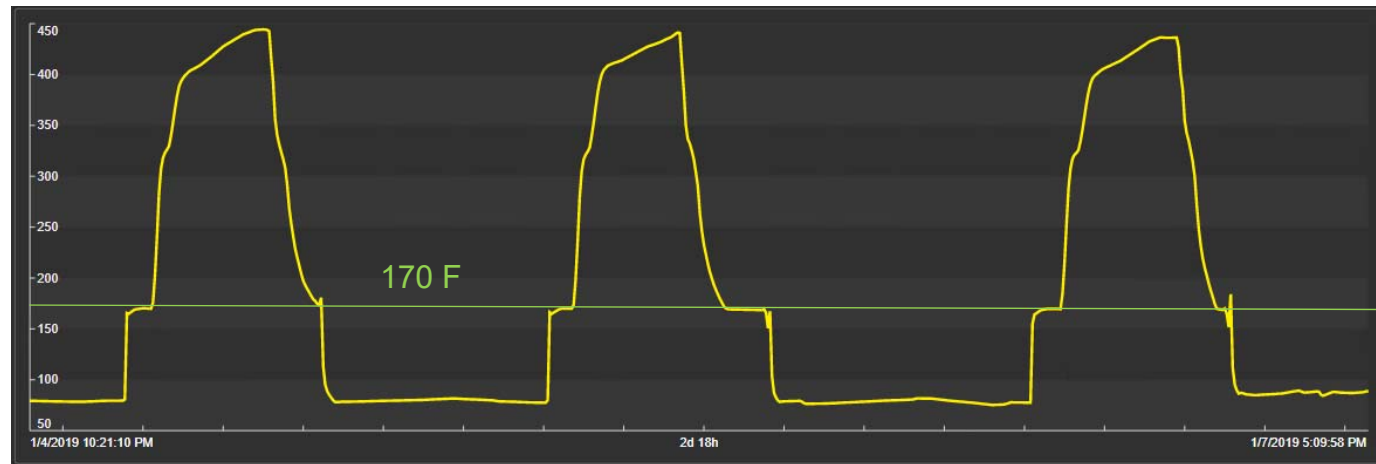
Data Engineering
Process



Framing Rule from Outlet Temperature Pattern

Data Engineering
Process

First Backfill



Asset
Analytics

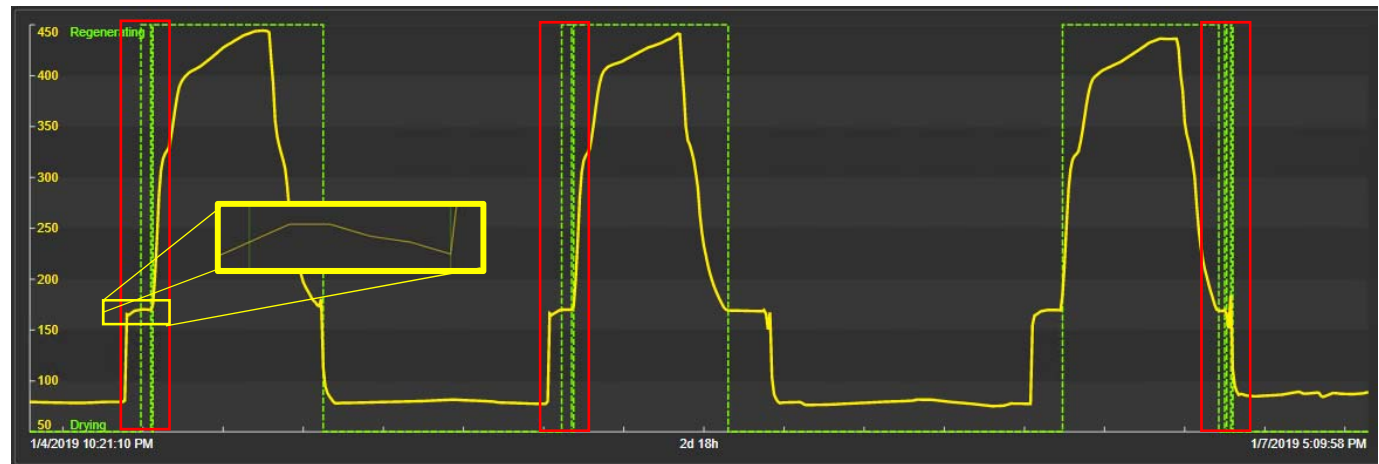
If 'Outlet Temperature' ≥ 170
Then "Regenerating"
Else "Process"

Framing Rule from Outlet Temperature Pattern

Data Engineering Process

First Backfill

- “False Starts”



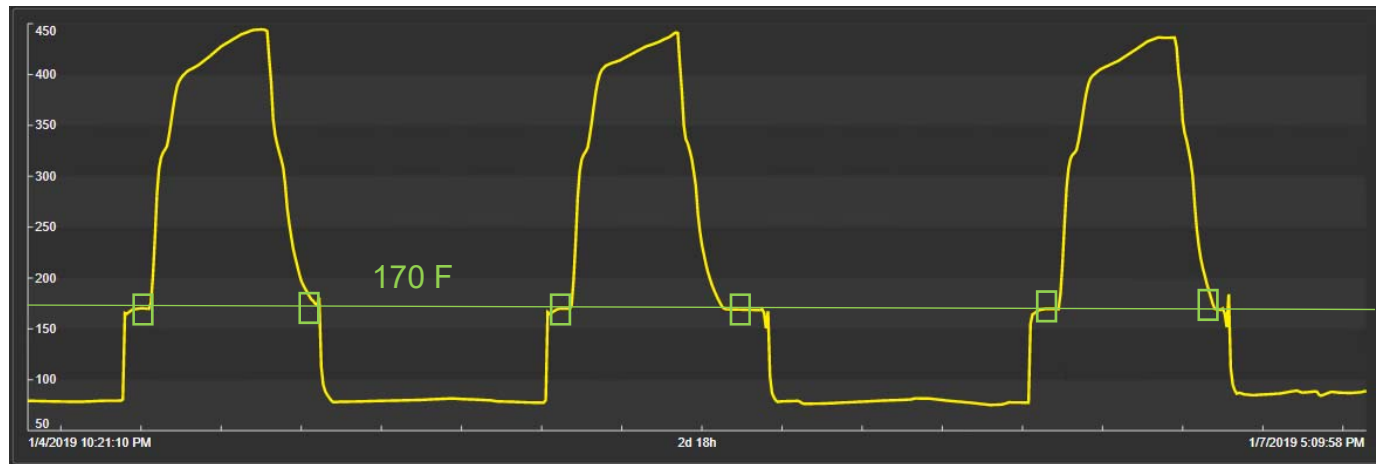
Framing Rule from Outlet Temperature Pattern

Data Engineering Process

First Backfill

- “False Starts”

Second Backfill



Asset
Analytics

```
If TagAvg('Outlet Temperature','*-1h','*') >= 170  
Then "Regenerating"  
Else "Process")
```

Framing Rule from Outlet Temperature Pattern

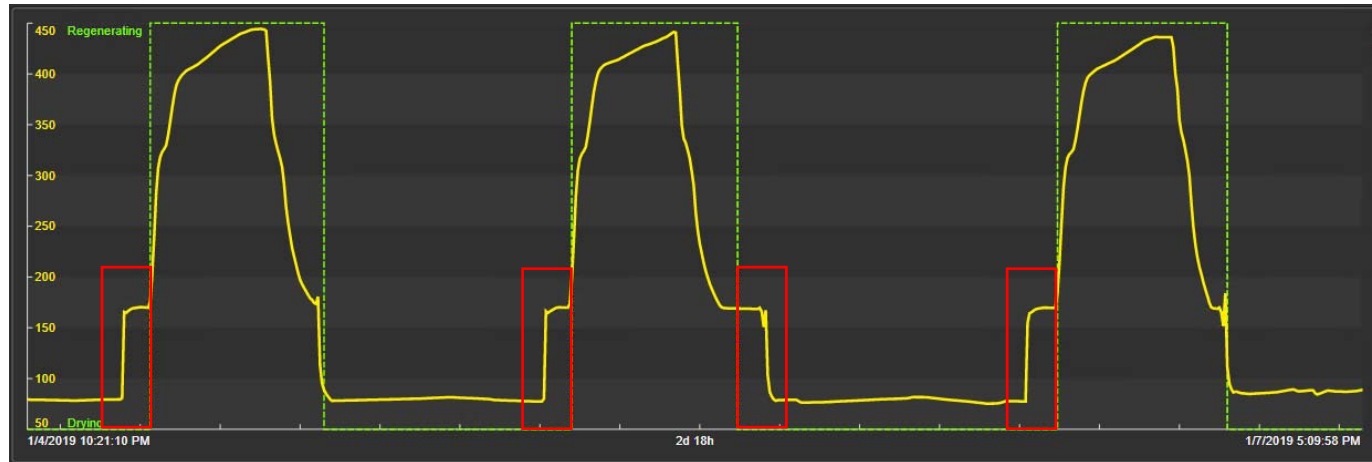
Data Engineering Process

First Backfill

- “False Starts”

Second Backfill

- **Missing third “Standby” State**



Framing Rule from Outlet Temperature Pattern

Data Engineering Process

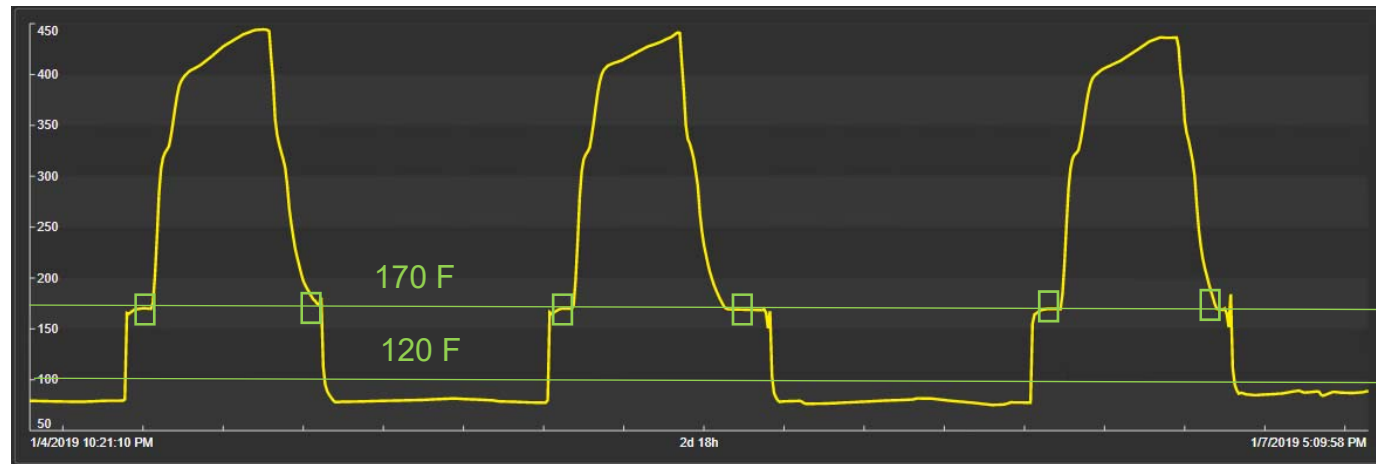
First Backfill

- “False Starts”

Second Backfill

- Missing
“Standby” State

Third Backfill



Asset
Analytics

If TagAvg('Outlet Temperature','*-1h','*') >= 170
Then "Regenerating"

Else (If 'Outlet Temperature' >= 120
Then "Standby"
Else "Process")

Framing Rule from Outlet Temperature Pattern

Data Engineering Process

First Backfill

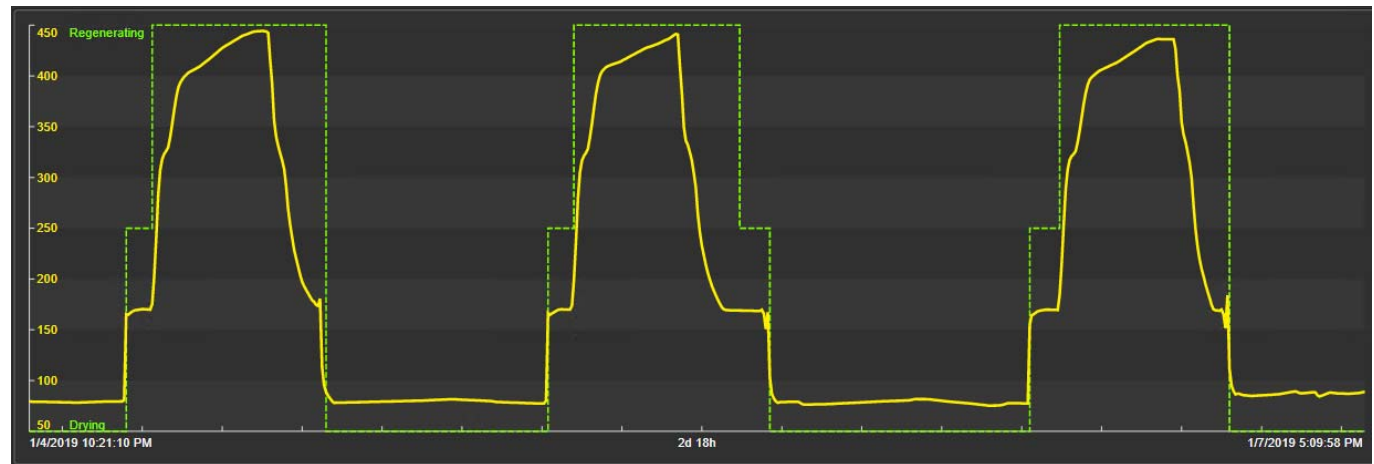
- “False Starts”

Second Backfill

- Missing “Standby” State

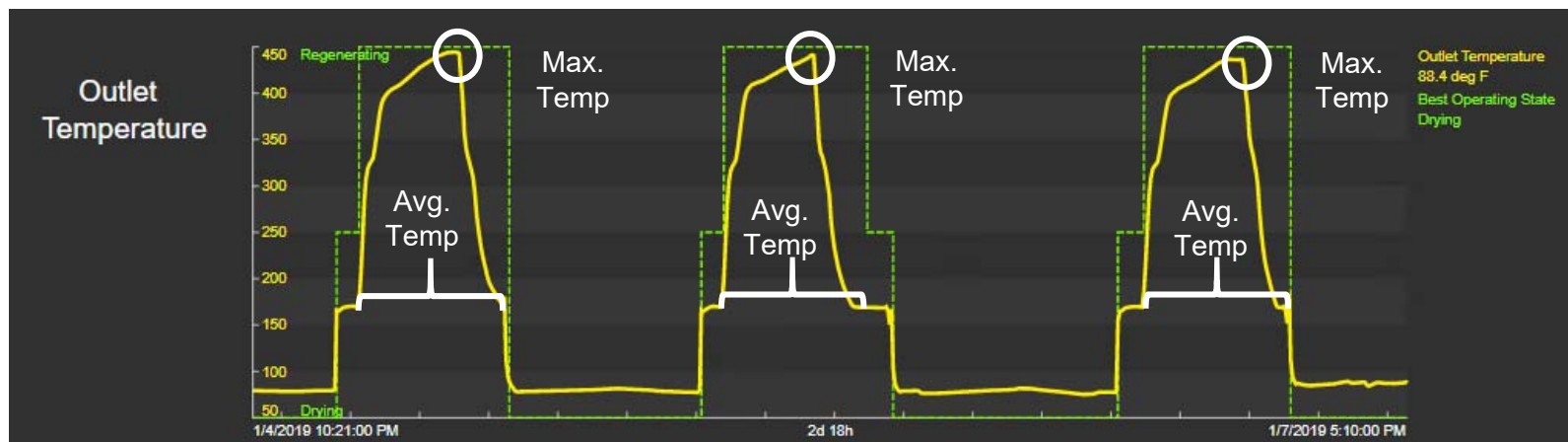
Third Backfill

- **Use it !**










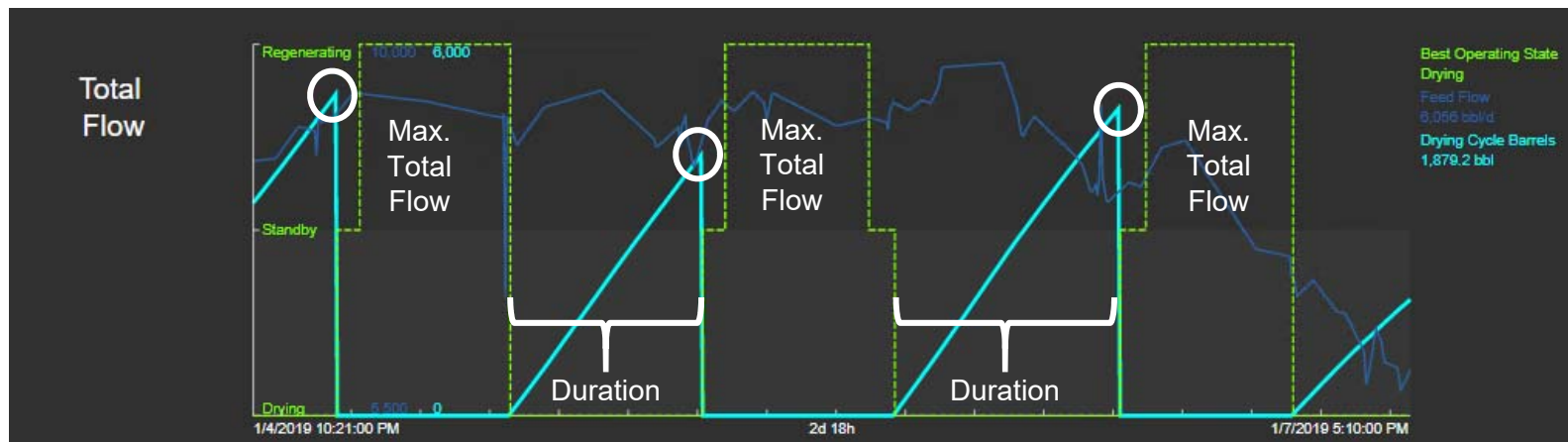
Complete Observation with Event Frame Attributes

Event Frame Search Results 1						
Filter						
Name	Duration	Start Time	End Time	Avg Outlet Temp	Max Outlet Temp	
Dryer A Regeneration Cycle 01-04-19 03:06	9:54:00	1/4/2019 3:06:00 AM	1/4/2019 1:00:00 PM	324.4 deg F	444.3 deg F	
Dryer A Regeneration Cycle 01-05-19 04:30	8:42:00	1/5/2019 4:30:00 AM	1/5/2019 1:12:00 PM	346.9 deg F	444.3 deg F	
Dryer A Regeneration Cycle 01-06-19 01:36	8:18:00	1/6/2019 1:36:00 AM	1/6/2019 9:54:00 AM	339.0 deg F	441.3 deg F	



Complete Observation with Event Frame Attributes

Event Frame Search Results 1								
Filter								
 Name	Duration	Start Time	End Time	▲	Avg Outlet Temp	Max Outlet Temp	Drying Cycle Duration	Drying Cycle Barrels
  Dryer A Regeneration Cycle 01-04-19 03:06	9:54:00	1/4/2019 3:06:00 AM	1/4/2019 1:00:00 PM		324.4 deg F	444.3 deg F	13.8 h	5259.6 bbl
  Dryer A Regeneration Cycle 01-05-19 04:30	8:42:00	1/5/2019 4:30:00 AM	1/5/2019 1:12:00 PM		346.9 deg F	444.3 deg F	14.0 h	5189.7 bbl
  Dryer A Regeneration Cycle 01-06-19 01:36	8:18:00	1/6/2019 1:36:00 AM	1/6/2019 9:54:00 AM		339.0 deg F	441.3 deg F	11.1 h	4207.6 bbl

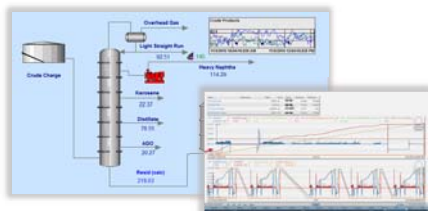


Access, Analysis and Model Enablement

Enabling Analytics for Operational Intelligence

Real-Time Decision Analysis

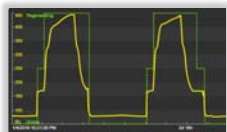
Retrospective & Predictive Analysis



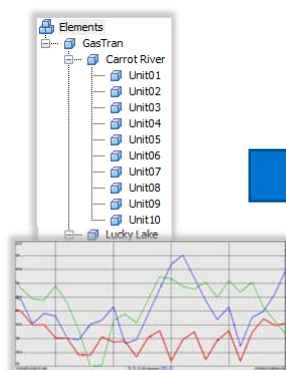
Diagnostic
Trending & Awareness

$$Q = \frac{\Delta P_{DD} * kh}{141.2 \mu B_0 \left\{ \ln \frac{r_e}{r_w} - \frac{3}{4} + S \right\}}$$

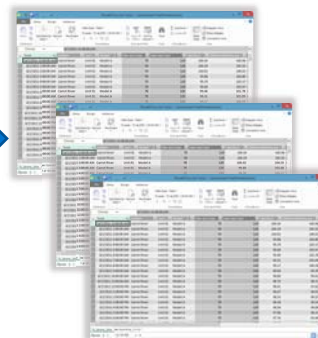
Descriptive
Condition & Performance



Event Frames



**Time, Event and
Asset Context**

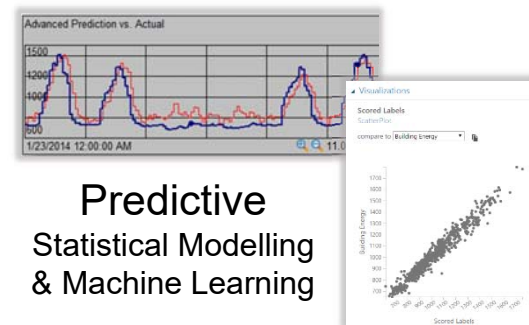


**Tabular
Context**

Common Ground between Technological
Contexts



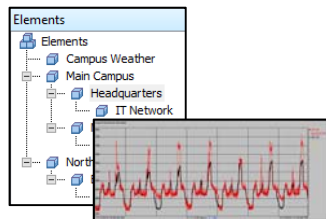
Visual
Dashboards &
Multidimensional Assessment



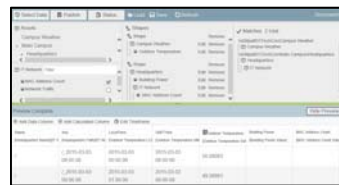
Predictive
Statistical Modelling
& Machine Learning

Open Data Access for Advanced Analysis Tools

Self-service access for Everyone



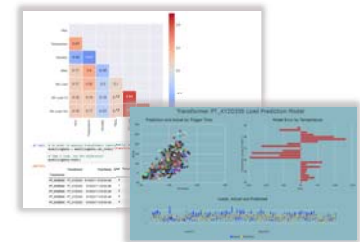
PI System



**PI Integrator for
Business Analytics**

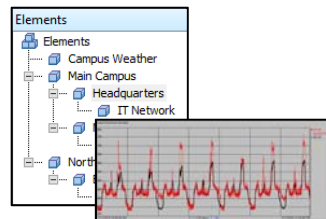


**MS SQL or .csv File
Azure or AWS**



Python,
Power BI,
etc.

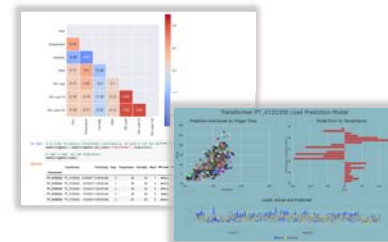
Direct programmatic access for Data Engineers and Scientists



PI System



- **PI SQL Client* (OLEDB)**
- **PI OLEDB Enterprise**
- **PI Web API and AF SDK**



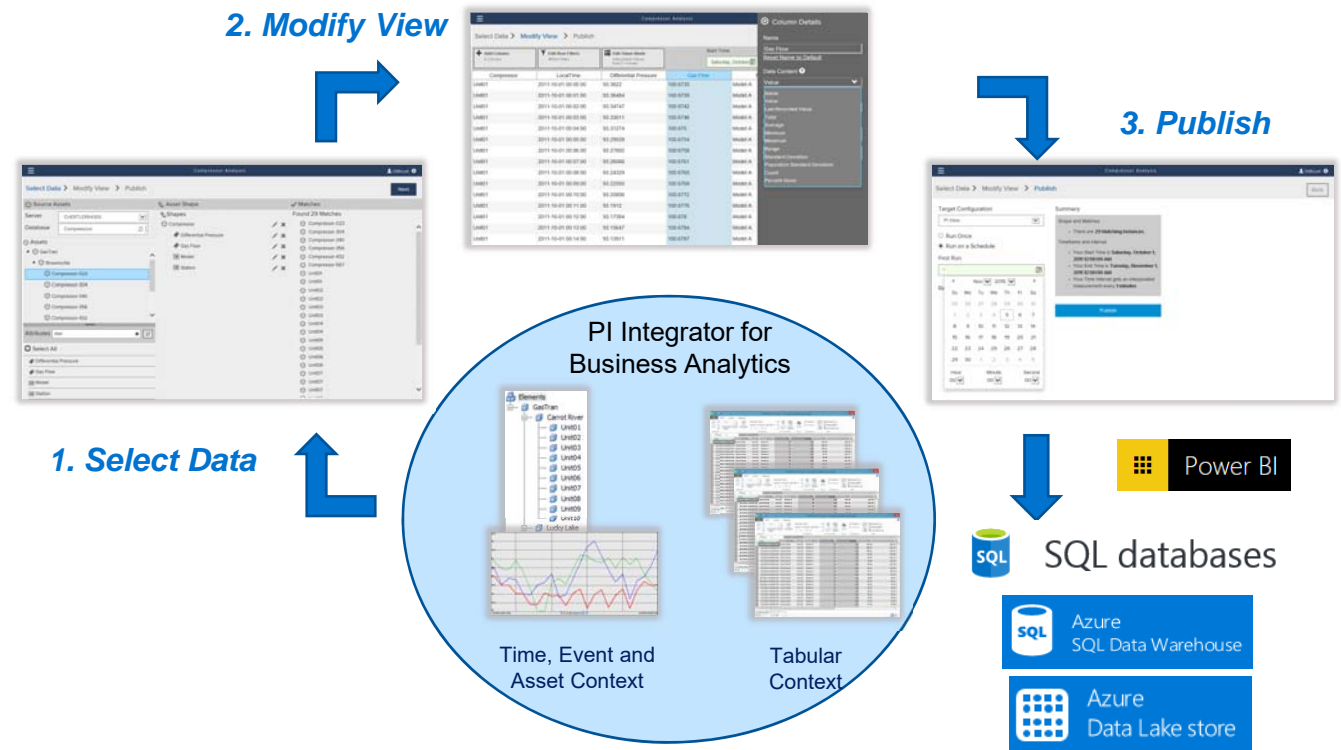
Python,
Power BI,
etc.

*** Requires RTQP
option in
PI Server 2018**

PI Integrator for Business Analytics

Easy, scalable way for users to create contextualized views of operational data.

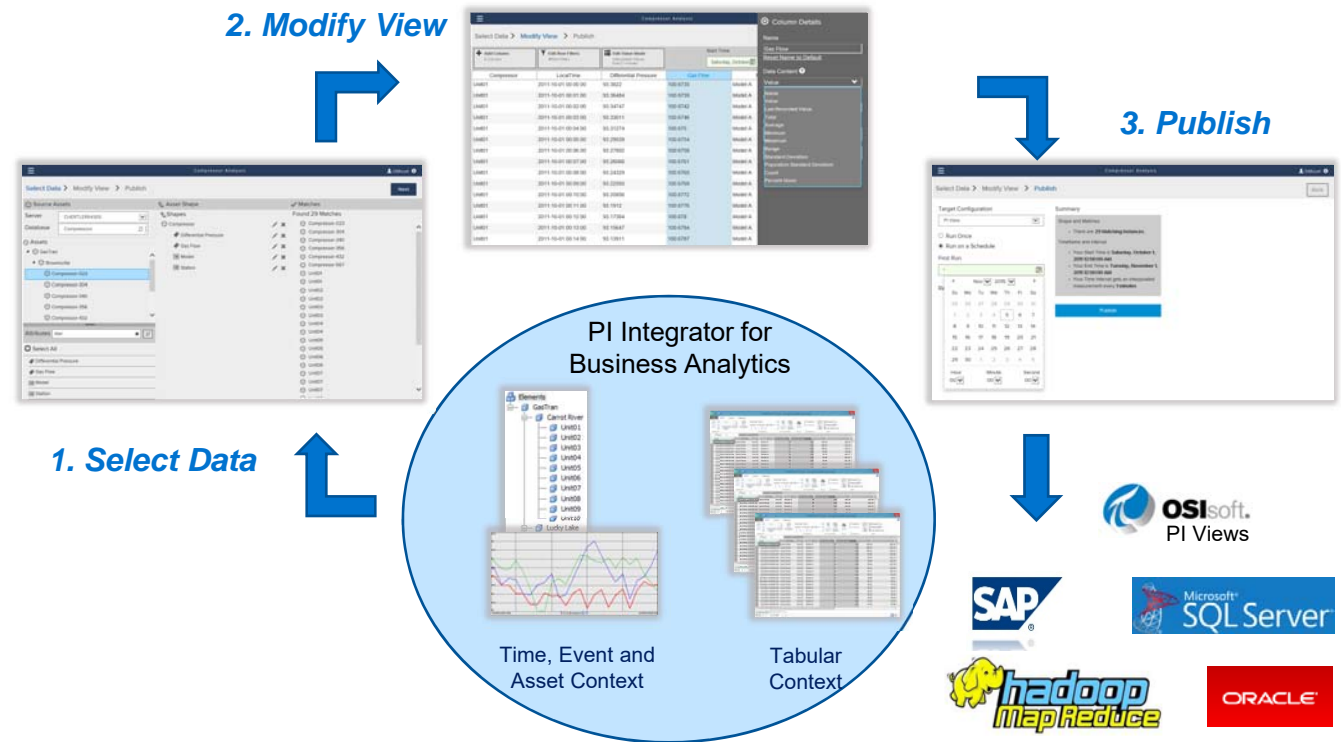
- **Select** assets and their attributes from an AF hierarchy.
- **Modify** view by setting time range, row interval, and column aggregations.
- **Add** filtering rules to “cleanse” data.
- **Publish** once or on a scheduled bases.



PI Integrator for Business Analytics

Easy, scalable way for users to create contextualized views of operational data.

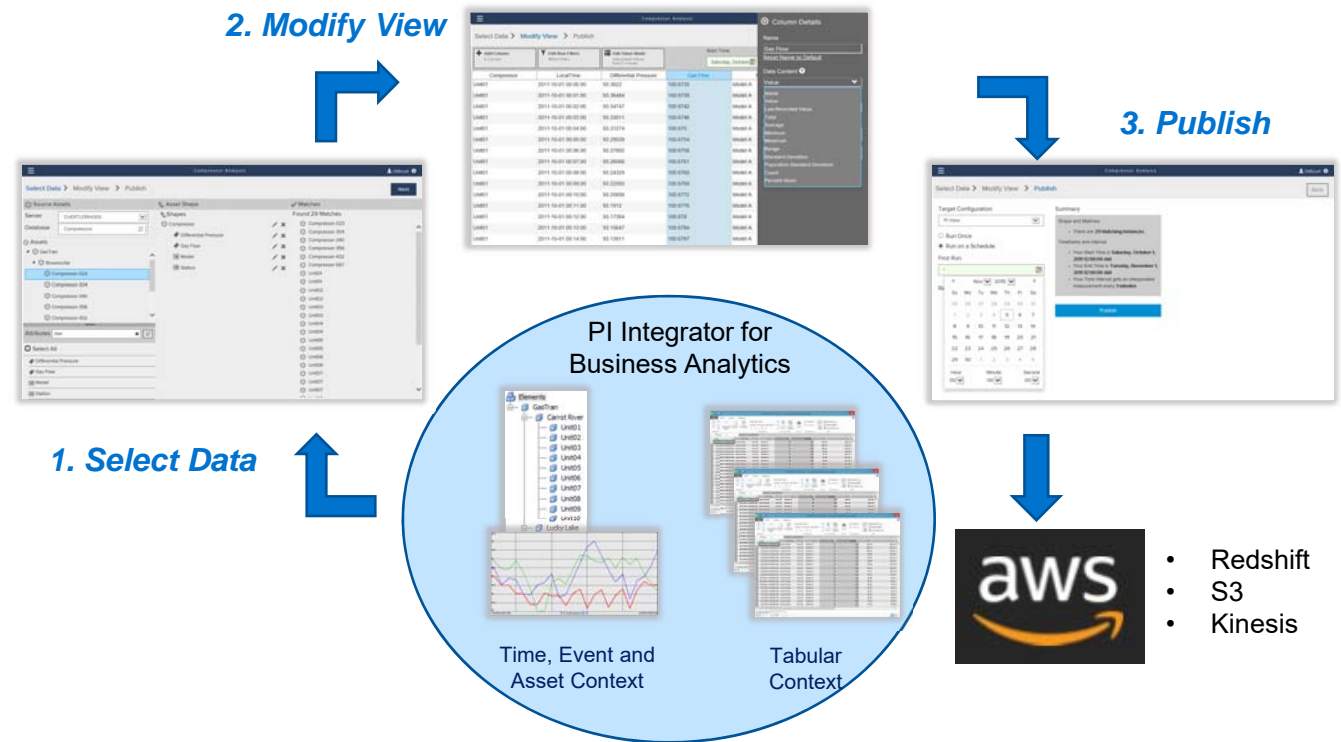
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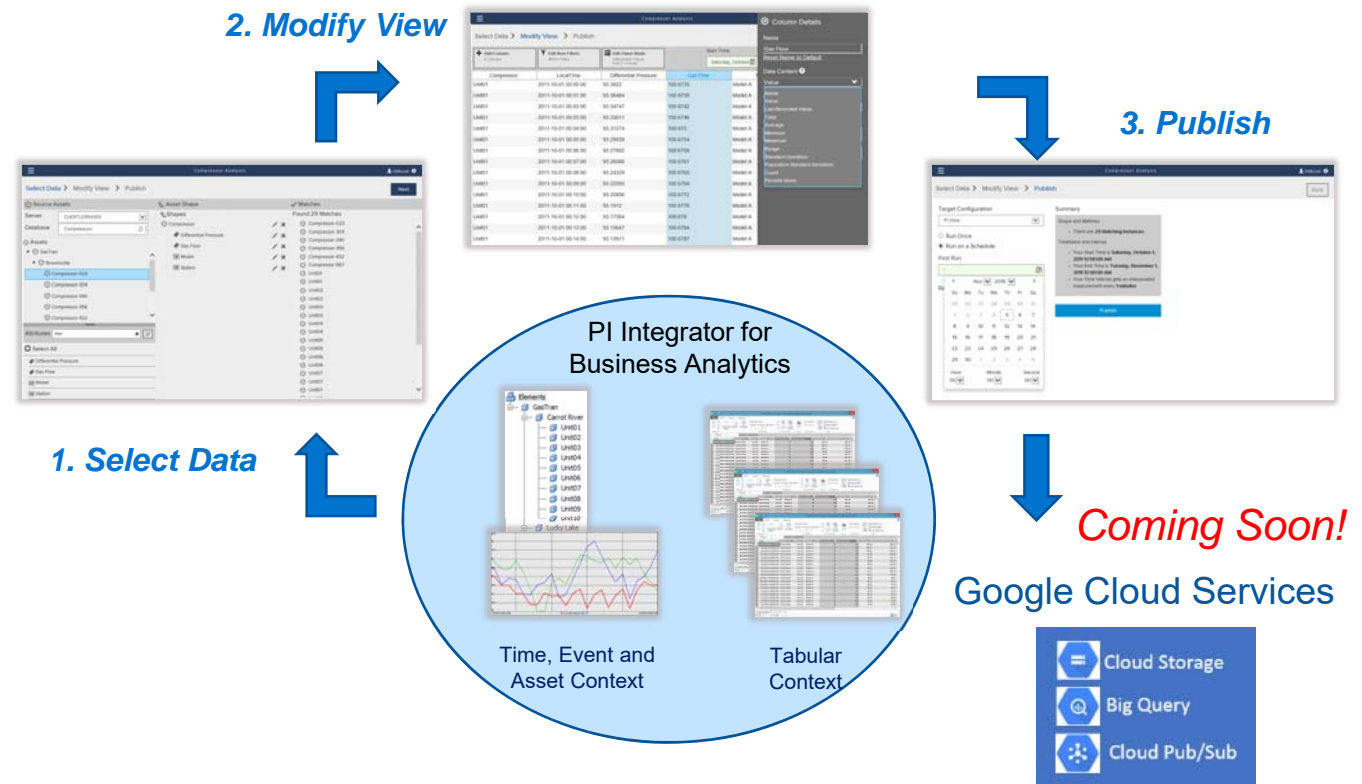
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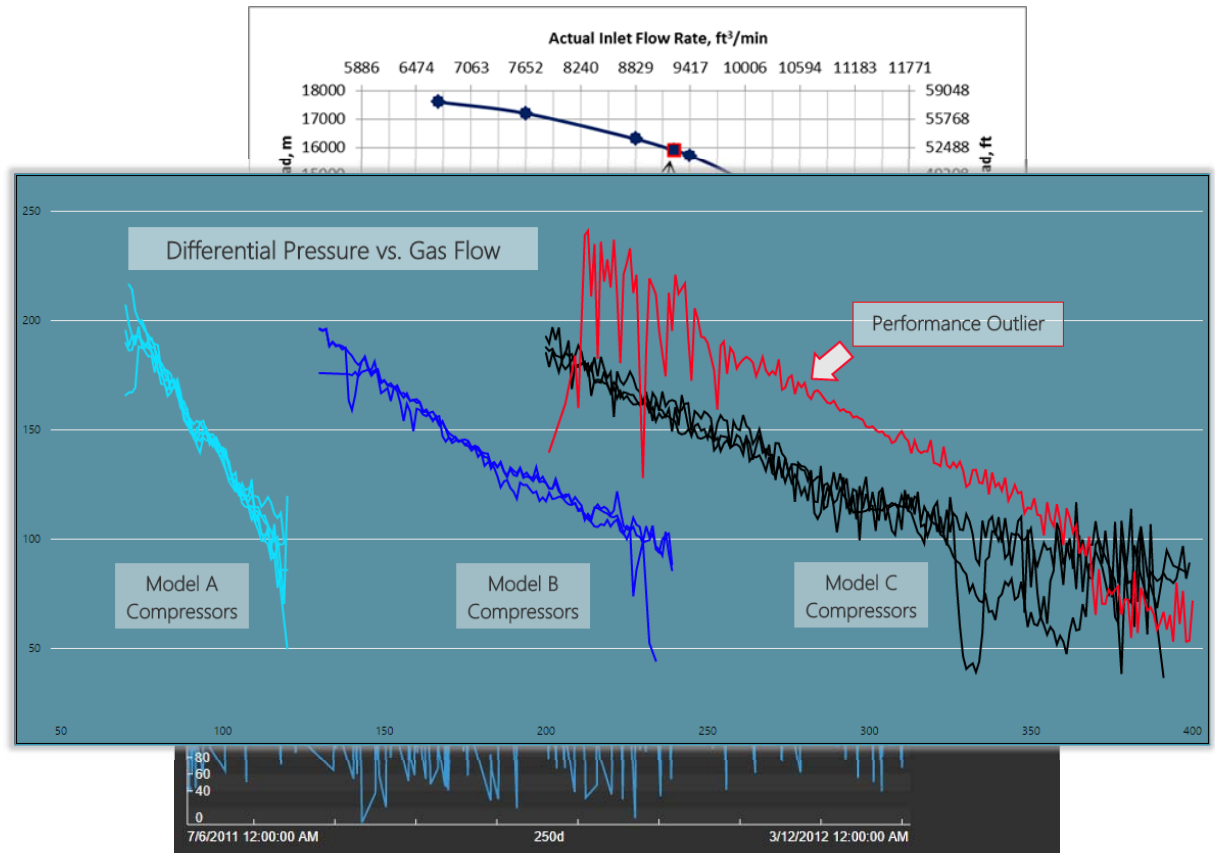
The collage features several distinct data visualizations:

- System Summary:** Includes a map of the United States with regional markers, a table of product volumes, and a bar chart showing net volume by month and product group.
- Average Outlet Temperature by Total Feed Volume Groups:** A line graph showing temperature trends over time for different feed volume groups.
- Differential Pressure vs. Gas Flow:** A line graph comparing model performance (Model A, B, C) against gas flow, highlighting a performance outlier.
- Active Power vs. Wind Speed:** A scatter plot showing the relationship between wind speed and active power.
- R Corplot:** A heatmap matrix showing the correlation between various variables.

Visual Analytics – Asset Benchmarking

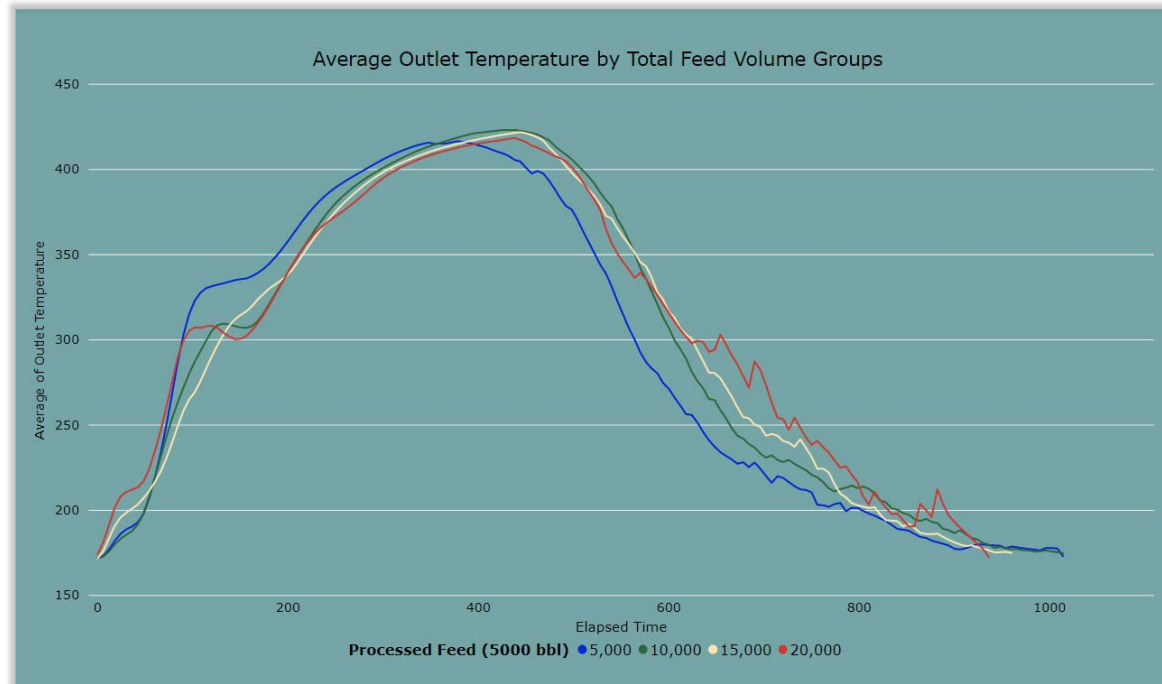
Benchmark all similar assets against known performance characteristics.

- Real-time trend of one asset is essential for current operation.
- Different tools required to analyze groups of assets.
- PI Asset Views summarize months of actual operations exposing actual performance profile.



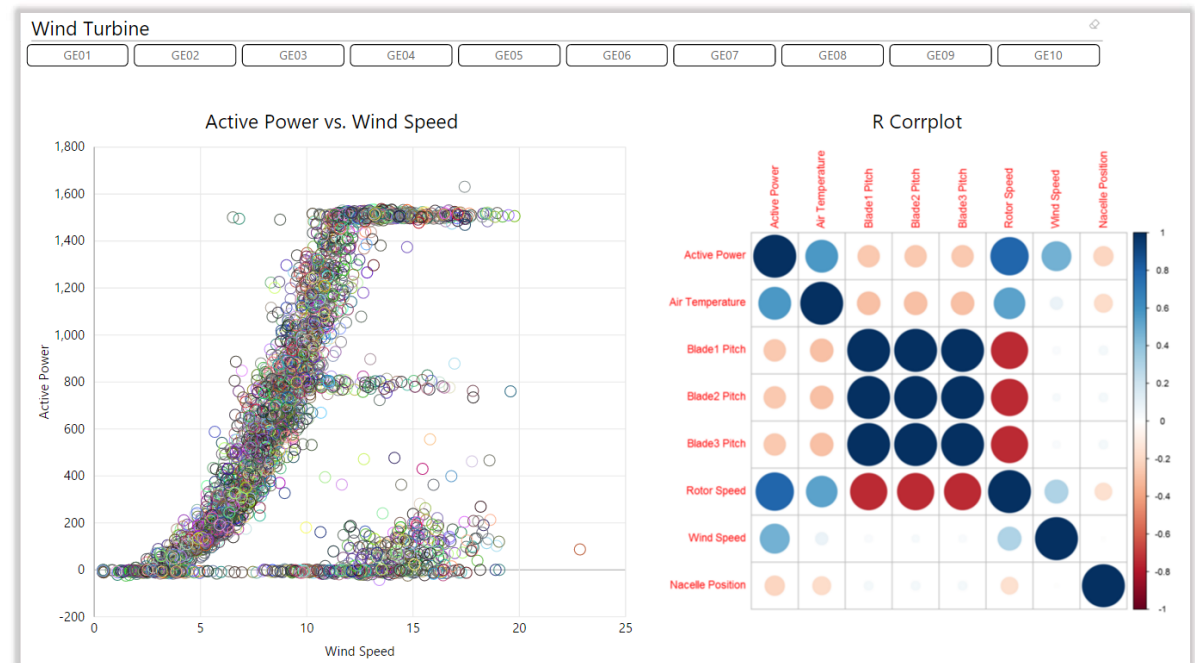
Visual Analytics - Event Frame Evaluation

- Sampled Event View dataset imported into Power BI.
- Shows 200 Event Frames grouped by Event Frame Attribute.

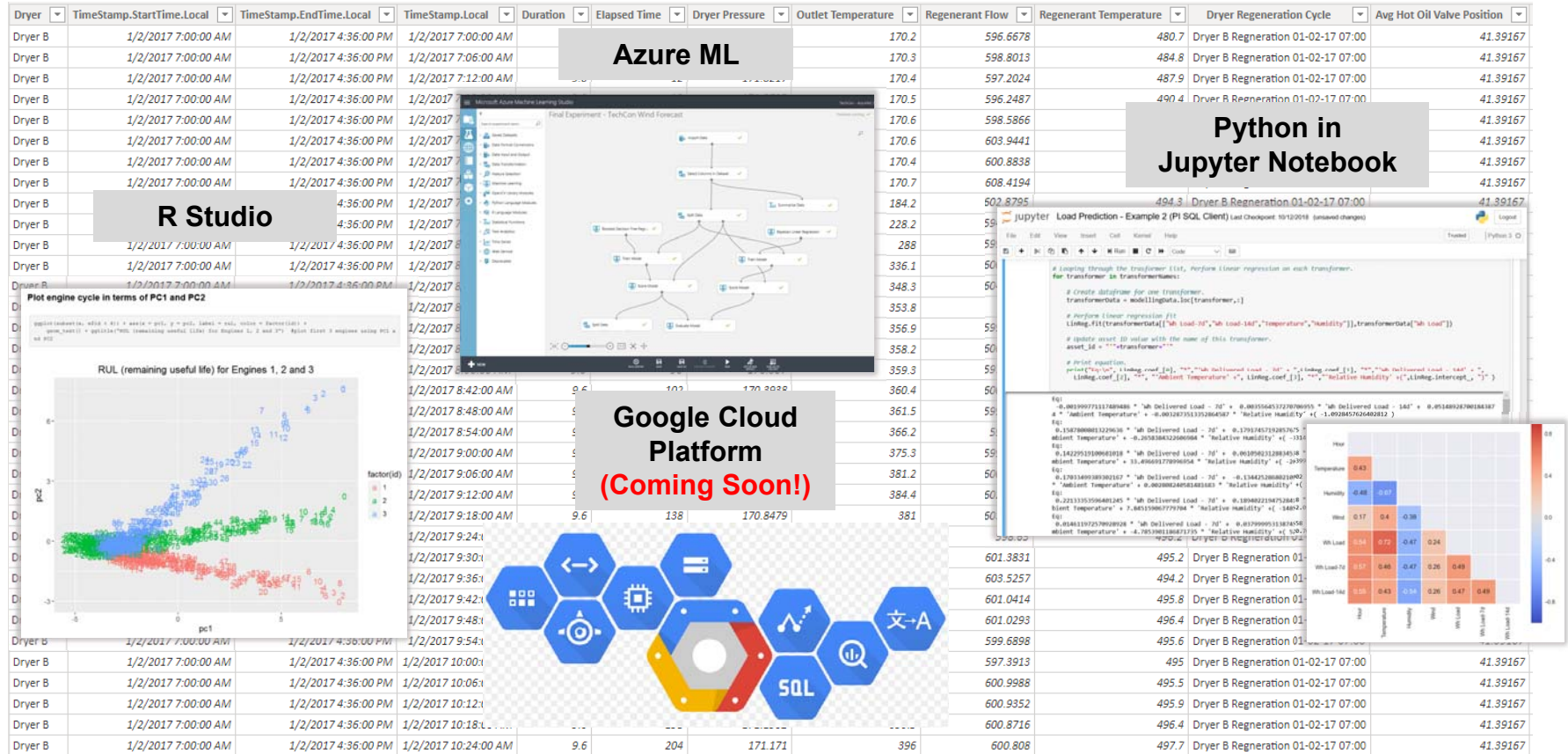


Visual Analytics - R and Python Integration

- Ad hoc, multidimensional front end for driving R and Python scripts.
- R “corrplot” to identify correlated variables.
- Identify data to be used for predictive model training.



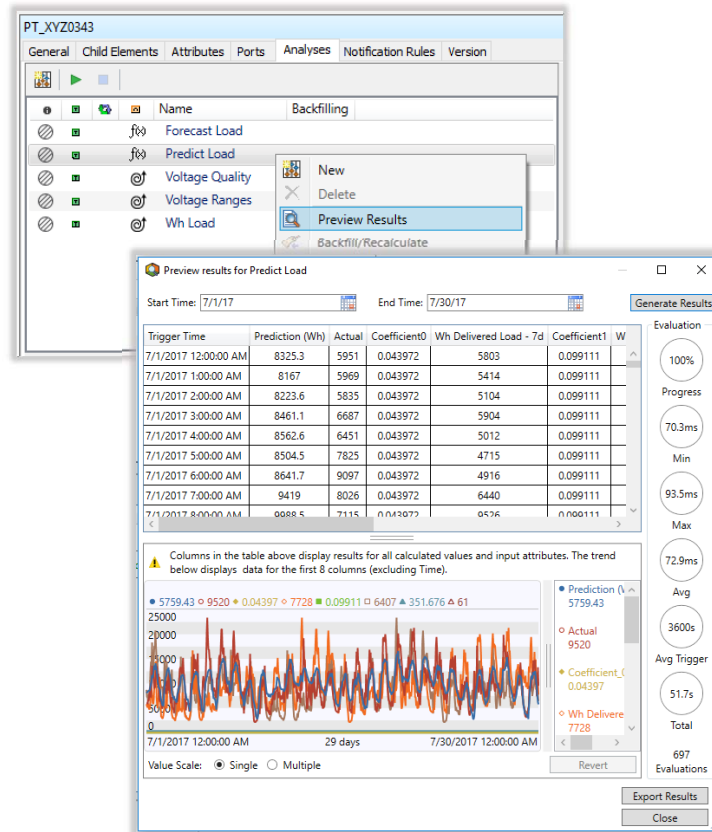
Advanced Analytics – R Studio, Python, Azure ML, GCP



Testing, Evaluation and Operationalization

Testing and Evaluation: Asset Analytics

Preview Results
feature of Asset
Analytics generates
model results
without posting
values to PI Points



	A	B	C	D
1	Trigger Time	Prediction (Wh)	Actual	
2	7/1/2017 0:00	8325.3	5951	
3	7/1/2017 1:00	8167	5969	
4	7/1/2017 2:00	8223.6	5835	
5	7/1/2017 3:00	8461.1	6687	
6	7/1/2017 4:00	8562.6	6451	
7	7/1/2017 5:00	8504.5	7825	
8	7/1/2017 6:00	8641.7	9097	
9	7/1/2017 7:00	9419	8026	
10	7/1/2017 8:00	9988.5	7115	
11	7/1/2017 9:00	10458	11052	
12	7/1/2017 10:00	11710	13563	
13	7/1/2017 11:00	11126	11933	
14	7/1/2017 12:00	11666	11642	
15	7/1/2017 13:00	12935	10199	

Export results for
analysis in Excel.

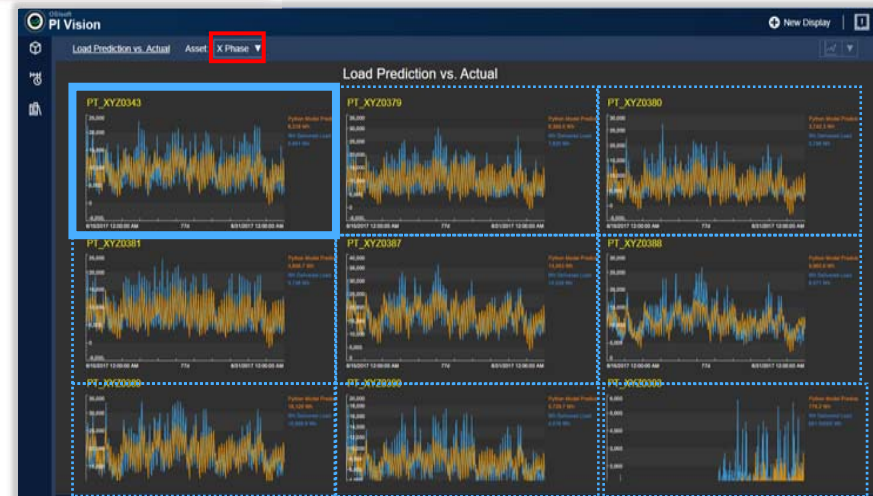
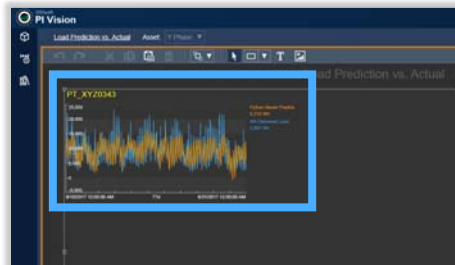
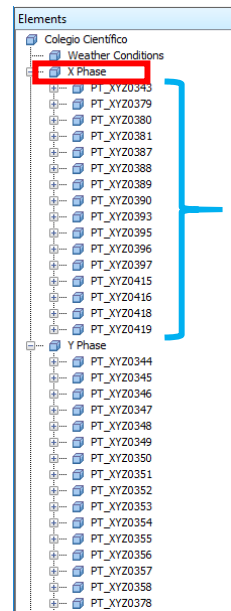
Testing and Evaluation: Model Prediction vs. Actual

Backfill

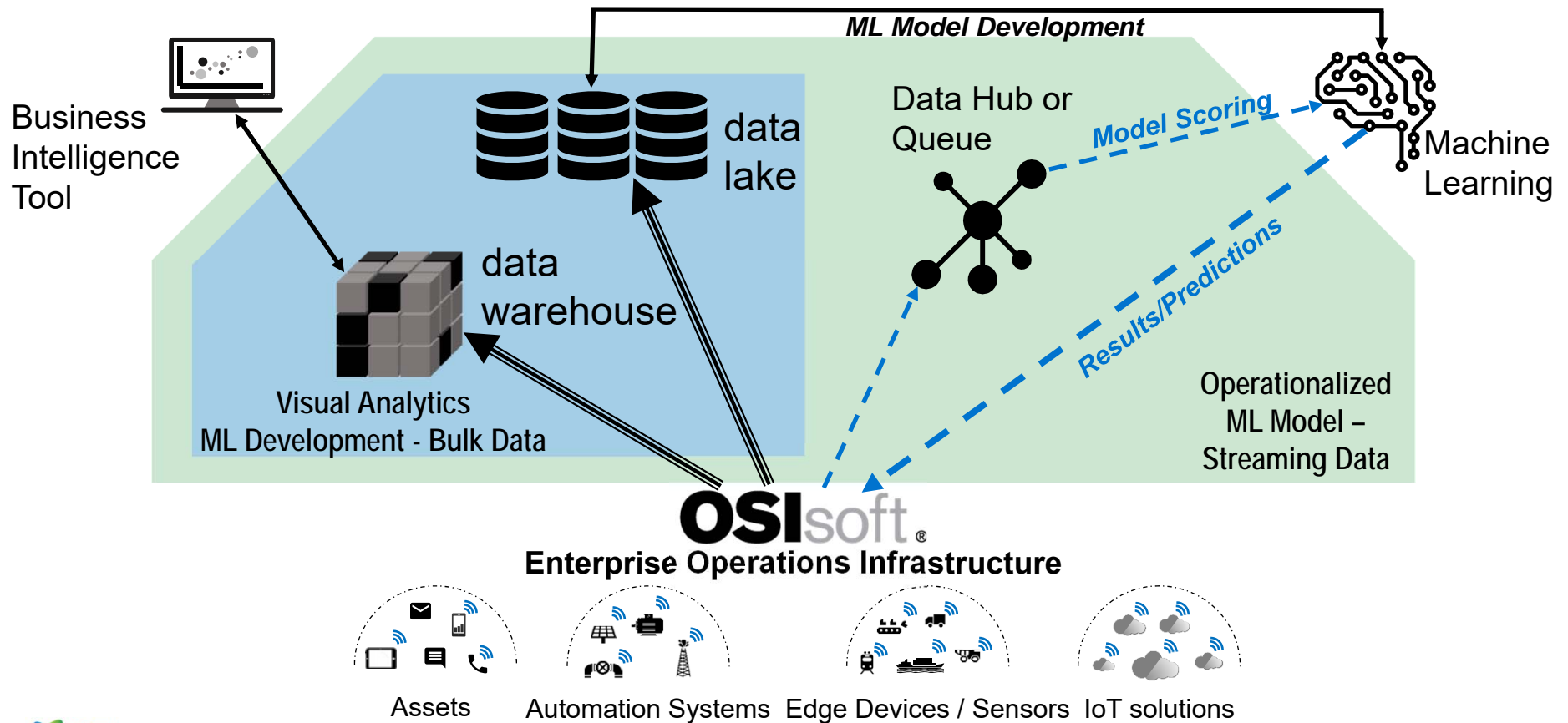
model results
into PI Point

PI Vision Collections

to inspect
model results



Operationalize - Advanced Analytics Patterns



PI World 2019 - “Exploring AF Analytics for Advanced Analysis and Prediction”

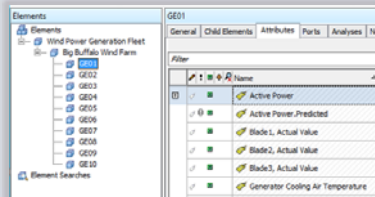


Example 2 – Web Service Endpoint Model

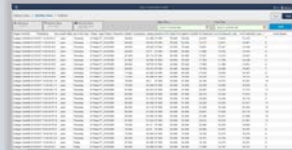
PI World 2017 - “Create and Operationalize Forecasting Models with the PI Infrastructure and Azure Machine Learning”

Modelling

AF Asset Model



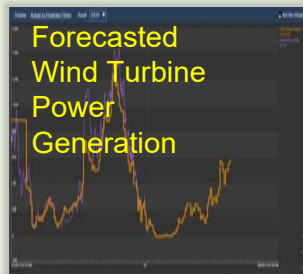
PI Integrator for BA (Standard)



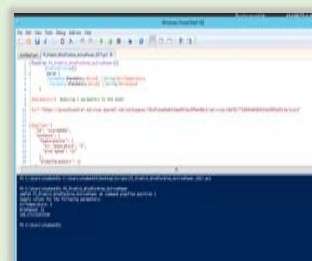
Azure SQL

Wind Turbine	Active Power	Air Temperature	Wind Speed
GE04	1497	10.9820789761013	11.4221096038818
GE04	1507	11.1894522772895	11.973090171814
GE04	1248	12.2263187812301	11.7494401931763
GE04	1304	16.1138694715712	11.7637701034546
GE04	1500.6662597656	16.2057643466526	11.8687696185503
GE04	1496	16.234230211046	11.9131698068598
GE04	1511	16.2518628438314	11.607439994812
GE04	1426	16.2610816955566	11.3789987564087

Azure ML

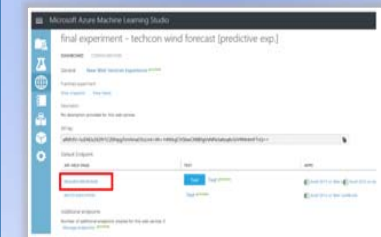


PI Archive, PI Future Data
& PI Vision



Windows PowerShell
PI Web API

Operationalize



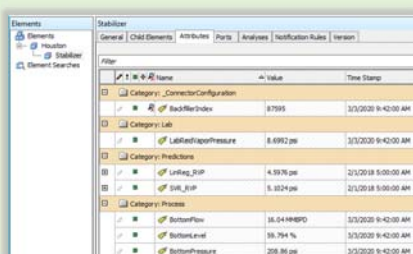
Azure ML Web
Service

Example 3 – Streaming Analytic

PI World 2018 - “Apply Predictive Machine Learning Models to Operations”

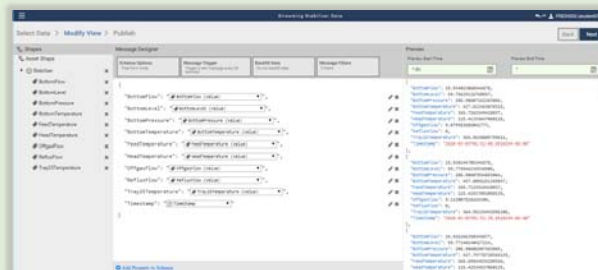
Operationalize

AF Asset Model



Category	Value	Time Stamp
Category_ConnectorConfiguration	6.755	3/2/2018 9:42:00 AM
Category_Lab	6.692 psi	3/2/2018 9:42:00 AM
Category_Predictions	4.5576 psi	3/2/2018 9:00:00 AM
Category_Predictions	5.824 psi	3/2/2018 9:00:00 AM
Category_Predictions	16.04 HHBPD	3/2/2018 9:42:00 AM
Category_Predictions	16.794 %	3/2/2018 9:42:00 AM
Category_Predictions	258.86 psi	3/2/2018 9:42:00 AM

PI Integrator for BA
(Advanced)



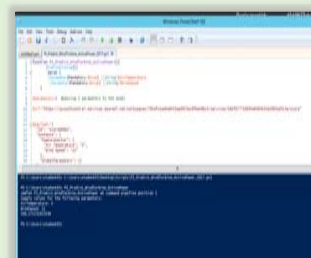
Kafka Broker

Kafka Consumer

Kafka Producer



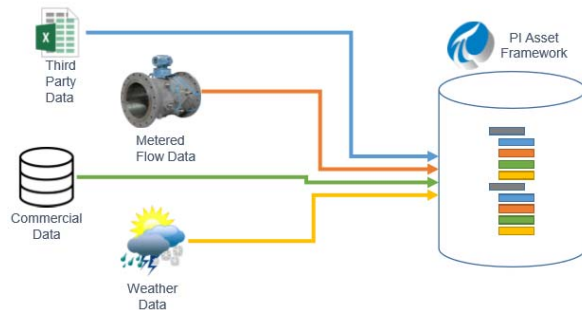
PI Archive, PI Future Data
& PI Vision



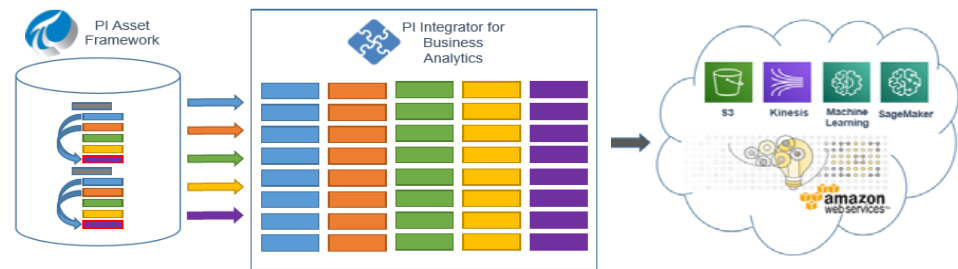
Python\Jupyter
PI Web API

TransCanada – Gas Pipeline Demand Forecasting

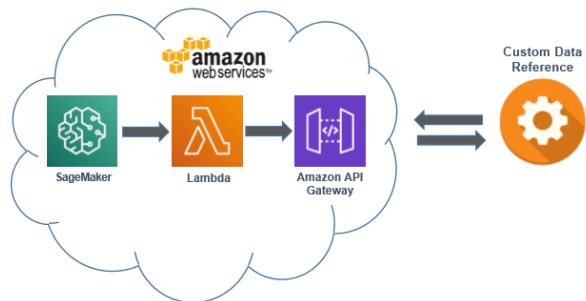
Navigating the Sea of Data



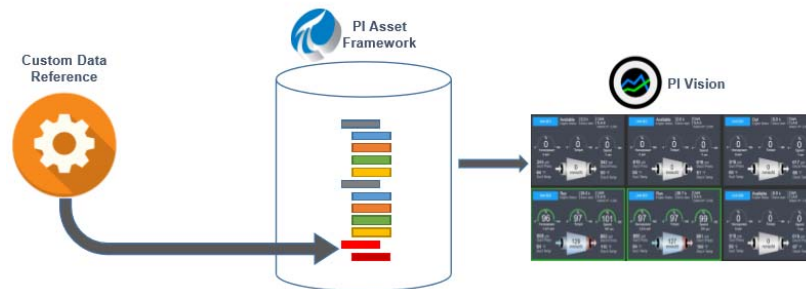
Feeding the Machine



Automating the Demand Forecast



































Consuming the Results



<https://www.osisoft.com/Presentations/TransCanada-s-Journey-to-Advanced-Analytics---Integrating-TransCanada-s-PI-AF-with-AWS-Machine-Learning/>

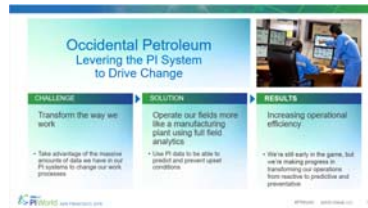
OSIsoft Partner Ecosphere – “Advanced Analytics”

 <p>Elinx by Elinxsoft Inc.</p> <p>BIHQ delivers powerful, event-driven applications with supporting APIs and Dashboards to drive performance improvement initiatives in.</p> <p>Show More</p> <p>Details</p>	 <p>TrendMiner TrendMiner - Self-service by TrendMiner LLC</p> <p>Self-service Advanced Analytics. Driving operational intelligence through advanced analytics for time-series data captured in the OSIsoft PI System.</p> <p>Show More</p> <p>Details</p>	 <p>Dream Report by Green Data Systems - Hixson of</p> <p>The leading independent software for industrial reports and dashboards.</p> <p>Details</p>	 <p>EnergyCenter Energy by IHS Markit Industrial Information</p> <p>The most comprehensive picture of Energy Management in 360 degrees. From Energy Monitoring through Energy Central, Energy Management (ECM) to Energy</p> <p>Details</p>	 <p>iEM System by OSIsoft Co., Ltd</p> <p>Asset Health Management system based on PI System architecture and OSIsoft's time-series data machine learning algorithm.</p> <p>Details</p>	 <p>SparkPredict by Spark-Cognition</p> <p>SparkPredict provides artificial intelligence capabilities to process the health of machine assets, predict downtime, minimize maintenance costs, and optimize</p> <p>Details</p>	 <p>Connect Point by ConnectPoint</p> <p>OEE & Downtime Tracking</p> <p>Rapidly monitor, analyze and visualization of the batch production status in terms of OEE and downtime tracking.</p> <p>Details</p>	 <p>ControlSoft by ControlSoft, Inc.</p> <p>INTUNE® Control Loop</p> <p>24/7 control loop performance monitoring and diagnostic software for optimizing plant-wide performance.</p> <p>Details</p>	 <p>Intelligent Plant Well Intelligence by Intelligent Plant Well</p> <p>Optimize your shale positions to gain more production without any complex modeling.</p> <p>Details</p>					
 <p>eschbach by eschbach</p> <p>is Performance OEE</p> <p>Simple OEE live accounting and analysis of target values, downtimes, quantities at batch cycle times for over better performance in all production.</p> <p>Show More</p> <p>Details</p>	 <p>Petroleum Industrial AI-pilot by Petrium Inc.</p> <p>Software services for AI-enabled production, operations, and maintenance.</p> <p>Details</p>	 <p>Seeq Workbench by Seeq Corporation</p> <p>Fastest data ingestion and elasticity for engineers with the OSIsoft PI System.</p> <p>Details</p>	 <p>Vortex Edge - Data Store by ADVA Technology</p> <p>Real-time data streaming from OSIsoft PI System to any platform, anywhere, then back again maintaining a single version of the truth.</p> <p>Details</p>	 <p>Vision OE by IT Vision, Inc.</p> <p>An easy-to-manage operational excellence platform with an intuitive interface. All your performance metrics, indicators, and data targets intelligently</p> <p>Details</p>	 <p>ThingWorx IOT Application by PTC Inc.</p> <p>Enables creation of apps, solutions and experiences for smart connected products.</p> <p>Details</p>	 <p>MSI by MSI</p> <p>Inside View - Insulating Oil</p> <p>Inside View is a diagnostic software that assures and manages data from equipment filled with dielectric fluid (Transformers, LTC, Breakers).</p> <p>Details</p>	 <p>Falkonry by Falkonry, Inc.</p> <p>Falkonry is used to increase yield, reduce downtime, and increase quality by identifying and reassigning patterns of and process operation from time-</p> <p>Details</p>	 <p>Revisys by The Revisys Company</p> <p>Facility Analytics</p> <p>Align utility consumption with major facility assets.</p> <p>Details</p>					
 <p>PredictIt by Engineering Consultants Group</p> <p>Realtime anomaly detection and diagnosis reasoning software.</p> <p>Details</p>	 <p>Livepoint X by TCS Integration Ltd</p> <p>An Enterprise Ready, Scalable Application Platform and Self-Service Dashboards in one. For real-time data visualization and Data Analytics on any Device.</p> <p>Show More</p> <p>Details</p>	 <p>ALIZENT by ALIZENT International</p> <p>Top Efficiency</p> <p>Enables end user performance data to stay on top of your efficiency while being a player in Energy Transition.</p> <p>Details</p>	 <p>Connect Point by ConnectPoint</p> <p>Smartware for Utilities</p> <p>Innovative platform of measurement data processing (MDS) combined with intelligent data analysis for Utility Heating and Power distribution.</p> <p>Details</p>	 <p>PIMS by PIMS Inc.</p> <p>Signifline System</p> <p>When the Margin is critical, Data Quality matters. Improve Business Process Integrity, Decision Ability & Operational Insight.</p> <p>Details</p>	 <p>PIMS by PIMS Inc.</p> <p>Signifline App for</p> <p>Empower AP with capability of evaluating thermodynamic properties of mixtures and fluids at any time.</p> <p>Details</p>	 <p>CSE ProCase by CSE - Icon, Inc.</p> <p>CSE ProCase is a smart, analytical solution leveraging an artificial neural net to forecast production of oil, gas, and water for existing and new wells.</p> <p>Details</p>	 <p>Casadeo by Toumetis, Inc.</p> <p>Casadeo™ is a proven platform for predictive analytics and anomaly machine learning for industrial IoT, developed by Toumetis, Inc.</p> <p>Details</p>	 <p>ALIZENT by ALIZENT International</p> <p>Predictive Maintenance</p> <p>Improve your profitability by increasing the availability of your production tool and control your maintenance costs.</p> <p>Details</p>	 <p>senseye by Senseye</p> <p>Senseye is the leading software product for Predictive Maintenance (PdM), rated by Fortune 500 companies to reduce unplanned downtime and double</p> <p>Show More</p> <p>Details</p>	 <p>PlantERP Loop Performance by Control Station, Inc.</p> <p>Plantwide monitoring and diagnostic solution for optimizing Operational, Control and Process performance.</p> <p>Details</p>	 <p>PIMS by PIMS Inc.</p> <p>Signifline App for LNG, LPG and</p> <p>This Signifline App implements primary and transfer compressor applications for LNG, LPG and H2 in the OSIsoft PI System.</p> <p>Details</p>	 <p>Process Pipeline Suite of by Process Innovation Inc.</p> <p>The Process Pipeline suite of apps provides an end-to-end solution for the gas data pipeline.</p> <p>Details</p>	 <p>PowerRunner by PowerRunner, LLC</p> <p>PowerRunner is an exceptionally efficient application that joins and delivers highly granular real-time OT/IT data to support operational decision management for critical</p> <p>Details</p>

<https://www.osisoft.com/marketplace/>

Accountability

“PI Don’t Lie”



Workbench for Relevant Operational Analytics

Data Engineering and Preparation

- PI System offers distinctive features for preparing time-series data for advanced analytics, e.g. asset context, process context and feature generation.

Access, Analysis and Model Enablement

- PI System provides multiple data access methods, meeting needs of data engineers or scientists.

Testing, Evaluation and Operationalization

- Asset Analytics plays an essential role in testing and evaluating developed models.
- PI Vision and Future Data support model integration and socialization for gaining relevance within Operations

Accountability

- “PI don’t lie.”

Contact Info



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- OSIsoft, LLC
- Curt@osisoft.com

Questions?

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the **microphone**

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October 26-29, 2020



