



# Transform Information into Intelligence

Presented by **Kevin Geneva**

# Transforming the value of data



Real-time Decision  
Support



System  
view



Individual  
view



Local  
view



Operation &  
Business insight



Group  
insight



Enterprise  
insight

# Information to intelligence: Insights to drive decisions



Transform



Transform



To **transform** information into operational & business intelligence...

**Context:** Data without context is limited

Real-time **Visualization:** Make information more consumable and actionable in real-time

- **Investigation:** People must be able to **ask** and **determine how** and **why**
- **Integration:** Information must be able to span across **physical** and **technological** bounds

# How does the PI System enable transforming information into intelligence?



## Capabilities

- PI Datalink
- PI Event Frames
- Future data (New)
- PI Integrator for Business Analytics (Coming)\*
- PI Integrator for SAP® HANA® (Coming)\*



# Enabling Investigation

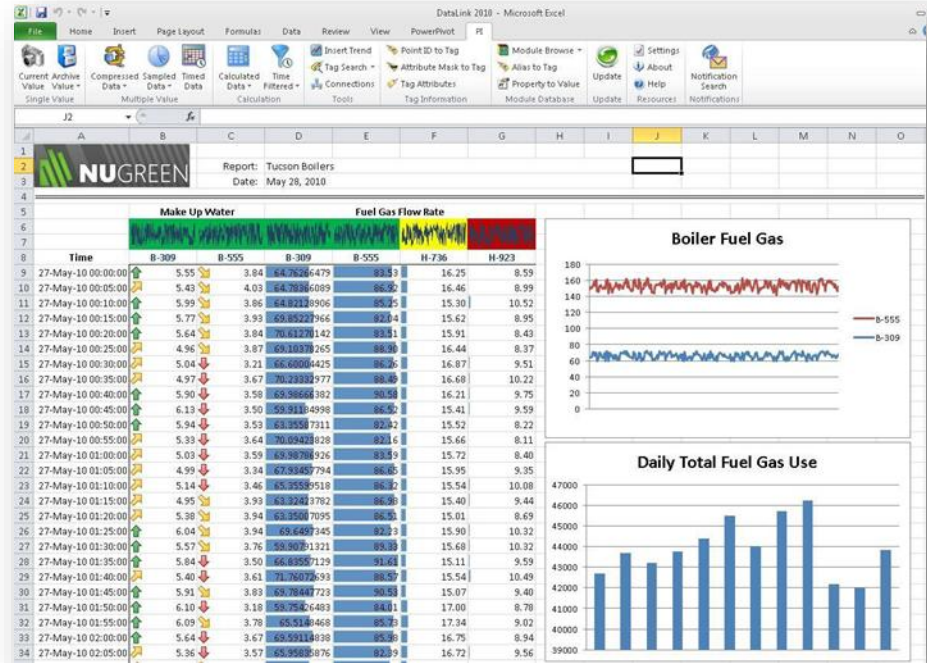
# Asking How & Why: PI DataLink provides seamless PI System access within Microsoft Excel

Create novel insights

Perform rapid investigation

Add-in to Microsoft Excel

- Create Reports
- Apply Calculations
- Retrieve data



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1																
2		AF Database	\\DFDELOREAN\Petrolux													
3																
4		Search Start	3/10/2014													
5		Search End	5/1/2014													
6		Event Name	*													
7		Event Template	*													
8		Element Name	*													
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10		# Events:	0													
11		# Attributes:	0													
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# Asking **How & Why**: PI Event Frames easily identifies events for deeper root cause investigation

- The most powerful way to automatically bookmark PI time-series data
  - Allows engineers and business users to derive meaning from their data
  - Simplifies searching, analyzing, and reporting

**Downtime  
Excursion  
Batch**

**Related Data**

Event Attribute	Value
Name	Ex 20141215-0002
Start	15-Dec-2014 10:35:02
End	15-Dec-2014 10:47:26
Duration	12 min, 24 sec
Asset	Boiler-352
Excursion Type	High Violation
Fuel Gas Flow Avg	37.12 k sft3/h
Fuel Start	823.48 k sft3/ton
myPIKPI Max	47.19 bbl/d



C8

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1					Event name	Start time	End time	Duration	Event template	Primary element	Well Name	Midas Number	Mud Weight In Average	Hole Depth Max	ROP Average	
2	AF Database		\\DFDELOREAN\Petroliu		Drill Rig 2 - 2014-03-29 11:56:00	29-Mar-14 11:56:00	12-Apr-14 04:57:04	13 17:01:04	Well Drilling	Drill Rig 2	Well6	No Data	10.1085675	16208.69	-95.13	
3					Stick-Slip - Drill Rig 2 - 2014-03-30 09:24:00	30-Mar-14 09:24:00	30-Mar-14 09:28:04	0 0:04:04	Stick-Slip	Drill Rig 2	Well6	42-501-20130-08-00			0.048144	
4	Search Start		3/10/2014		Rotary Drilling - Drill Rig 2 - 2014-03-30 09:28:04	30-Mar-14 09:28:04	30-Mar-14 10:12:27	0 0:44:23	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	10.93031855			
5	Search End		5/1/2014		Sliding - Drill Rig 2 - 2014-03-30 10:12:27	30-Mar-14 10:12:27	30-Mar-14 10:12:27	0 2:44:51	Sliding	Drill Rig 2	Well6	42-501-20130-08-00	9.43496746		113.8426	
6	Event Name	*			Rotary Drilling - Drill Rig 2 - 2014-03-30 10:33:14	30-Mar-14 10:33:14	30-Mar-14 13:40:28	0 3:07:14	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	9.029625886			
7	Event Template	*			Stick-Slip - Drill Rig 2 - 2014-03-30 11:27:45	30-Mar-14 11:27:45	30-Mar-14 11:29:49	0 0:02:04	Stick-Slip	Drill Rig 2	Well6	42-501-20130-08-00			1.010853	
8	Element Name		Drill Rig 2	*	Stick-Slip - Drill Rig 2 - 2014-03-30 11:51:44	30-Mar-14 11:51:44	30-Mar-14 11:54:58	0 0:03:14	Stick-Slip	Drill Rig 2	Well6	42-501-20130-08-00			0.305763	
9				*	Sliding - Drill Rig 2 - 2014-03-30 13:40:28	30-Mar-14 13:40:28	30-Mar-14 20:16:09	0 6:35:41	Sliding	Drill Rig 2	Well6	42-501-20130-08-00	8.490364106		169.6429	
10	# Events:			Drill Rig 1 Drill Rig 2	Rotary Drilling - Drill Rig 2 - 2014-03-30 13:40:30	30-Mar-14 13:40:30	30-Mar-14 14:50:54	0 1:10:24	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.422001144			
11	# Attributes:		5,437		Rotary Drilling - Drill Rig 2 - 2014-03-30 15:00:53	30-Mar-14 15:00:53	30-Mar-14 15:21:13	0 0:20:20	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.44529709			
12					Rotary Drilling - Drill Rig 2 - 2014-03-30 15:27:17	30-Mar-14 15:27:17	30-Mar-14 16:36:16	0 1:08:59	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.466646445			
13					Stick-Slip - Drill Rig 2 - 2014-03-30 16:46:21	30-Mar-14 16:46:21	30-Mar-14 16:51:14	0 0:04:53	Stick-Slip	Drill Rig 2	Well6	42-501-20130-08-00			0.059614	
14					Rotary Drilling - Drill Rig 2 - 2014-03-30 16:51:14	30-Mar-14 16:51:14	30-Mar-14 17:36:20	0 0:45:06	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.496953622			
15					Rotary Drilling - Drill Rig 2 - 2014-03-30 17:44:16	30-Mar-14 17:44:16	30-Mar-14 18:09:44	0 0:25:28	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.515142838			
16					Rotary Drilling - Drill Rig 2 - 2014-03-30 18:17:38	30-Mar-14 18:17:38	30-Mar-14 18:41:35	0 0:23:57	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.528867173			
17					Rotary Drilling - Drill Rig 2 - 2014-03-30 18:49:16	30-Mar-14 18:49:16	30-Mar-14 19:08:21	0 0:19:05	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.541156995			
18					Rotary Drilling - Drill Rig 2 - 2014-03-30 19:19:31	30-Mar-14 19:19:31	30-Mar-14 19:38:51	0 0:19:20	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.553777708			
19					Rotary Drilling - Drill Rig 2 - 2014-03-30 19:48:42	30-Mar-14 19:48:42	30-Mar-14 20:10:38	0 0:21:56	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.566003772			
20					Sliding - Drill Rig 2 - 2014-03-30 20:16:14	30-Mar-14 20:16:14	31-Mar-14 13:20:34	0 17:04:20	Sliding	Drill Rig 2	Well6	42-501-20130-08-00	8.842457879		174.3317	
21					Rotary Drilling - Drill Rig 2 - 2014-03-30 20:17:52	30-Mar-14 20:17:52	30-Mar-14 20:42:06	0 0:24:14	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.578162568			
22					Rotary Drilling - Drill Rig 2 - 2014-03-30 20:47:41	30-Mar-14 20:47:41	30-Mar-14 21:11:06	0 0:23:25	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.589957068			
23					Rotary Drilling - Drill Rig 2 - 2014-03-30 21:16:01	30-Mar-14 21:16:01	30-Mar-14 21:40:58	0 0:24:57	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.601627908			
24					Rotary Drilling - Drill Rig 2 - 2014-03-30 21:47:03	30-Mar-14 21:47:03	30-Mar-14 21:57:58	0 0:10:55	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.611260027			
25					Rotary Drilling - Drill Rig 2 - 2014-03-30 22:05:57	30-Mar-14 22:05:57	30-Mar-14 22:11:06	0 0:05:09	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.617683668			
26					Rotary Drilling - Drill Rig 2 - 2014-03-30 22:19:27	30-Mar-14 22:19:27	30-Mar-14 22:42:35	0 0:23:08	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.626704171			
27					Rotary Drilling - Drill Rig 2 - 2014-03-30 22:46:37	30-Mar-14 22:46:37	30-Mar-14 23:25:14	0 0:38:37	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.6407045			
28					Stick-Slip - Drill Rig 2 - 2014-03-30 23:18:12	30-Mar-14 23:18:12	30-Mar-14 23:20:16	0 0:02:04	Stick-Slip	Drill Rig 2	Well6	42-501-20130-08-00			0.083413	
29					Stick-Slip - Drill Rig 2 - 2014-03-30 23:21:08	30-Mar-14 23:21:08	30-Mar-14 23:23:38	0 0:02:30	Stick-Slip	Drill Rig 2	Well6	42-501-20130-08-00			1.146923	
30					Rotary Drilling - Drill Rig 2 - 2014-03-30 23:25:48	30-Mar-14 23:25:48	30-Mar-14 23:26:21	0 0:00:33	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.648785854			
31					Rotary Drilling - Drill Rig 2 - 2014-03-30 23:27:54	30-Mar-14 23:27:54	30-Mar-14 23:28:06	0 0:00:12	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.6493557894			
32					Rotary Drilling - Drill Rig 2 - 2014-03-30 23:31:15	30-Mar-14 23:31:15	31-Mar-14 02:04:02	0 2:32:47	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.681498664			
33					Stick-Slip - Drill Rig 2 - 2014-03-30 23:52:26	30-Mar-14 23:52:26	31-Mar-14 02:06:13	0 0:33:47	Stick-Slip	Drill Rig 2	Well6	42-501-20130-08-00			0.012255	
34					Rotary Drilling - Drill Rig 2 - 2014-03-31 02:04:18	31-Mar-14 02:04:18	31-Mar-14 02:04:45	0 0:00:27	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.712333778			
35					Rotary Drilling - Drill Rig 2 - 2014-03-31 02:06:30	31-Mar-14 02:06:30	31-Mar-14 02:07:07	0 0:00:37	Rotary Drilling	Drill Rig 2	Well6	42-501-20130-08-00	8.713249531			

LIVE

Drill Rig Events

Drilling Stick Slip Events

Production Downtime

Downtime Analysis Pivot

GLOBAL

# Asking **How** & **Why**: PI Event Frames are integrated across the PI System

Event detection  
Root cause event  
identification

**Event  
Generation**

Hierarchical & batch  
event generation

A scalable event  
Infrastructure

**Event  
Database**

Event storage  
Related data  
Calculations  
Event auditing

Exploring & comparing  
events in Excel  
Ad-hoc reporting

**Event  
Visualization**

Event trending  
Root cause trending  
Hierarchical trending  
Event attribute visualizing  
Event comparing

Reporting &  
BI integration  
3<sup>rd</sup> party integration

**Event  
Integration**

SOAP access  
Mobile app  
compatibility  
Programmatic access



## Integrating Information to Drive Insights

# Integration: What could you do if you knew the future of your...

## PRODUCTION

Are we on track to hit our production targets?

Do the fiscal projections justify deviating from standard operation?

## DEMAND

How much power will our customers need in the next 24 hours?

How much material are we obligated to deliver?

## ENVIRONMENT

Are there enough units online to handle the storm?

Is there an abnormal heat wave that will compromise the grid?

Historical



01

Real-Time



Future Data



# Integration: Integrate forecasts directly into your PI System

California ISO

ABOUT US PARTICIPATE STAY INFORMED PLANNING MARKET & OPERATIONS RULES

Joining us

Going green

Looking ahead

**Today's Outlook** Mon Jun 1 08:54:06 2015

Current Demand: 26,827 MW Forecast Peak: 29,796 MW

Calendar

MONDAY, 06/1/2015  
iCal 12:00 AM - 11:59 PM

TUESDAY, 06/2/2015  
iCal 10:00 AM - 11:00 AM Peak Reliability Coordination  
iCal 10:00 AM - 11:00 AM Technical Users Group

WEDNESDAY, 06/3/2015  
iCal 10:00 AM - 11:00 AM Market Settlement User Group  
iCal 1:00 PM - 3:00 PM Outage Management System Customer Page

QUICK LINKS

Board  
Business Practice Manuals  
Careers  
Tariff

STAY INFORMED

Alerts, Warnings and Emergency Notifications  
Market Notices  
Notification Signups  
Recent Documents

RELATED WEBSITES

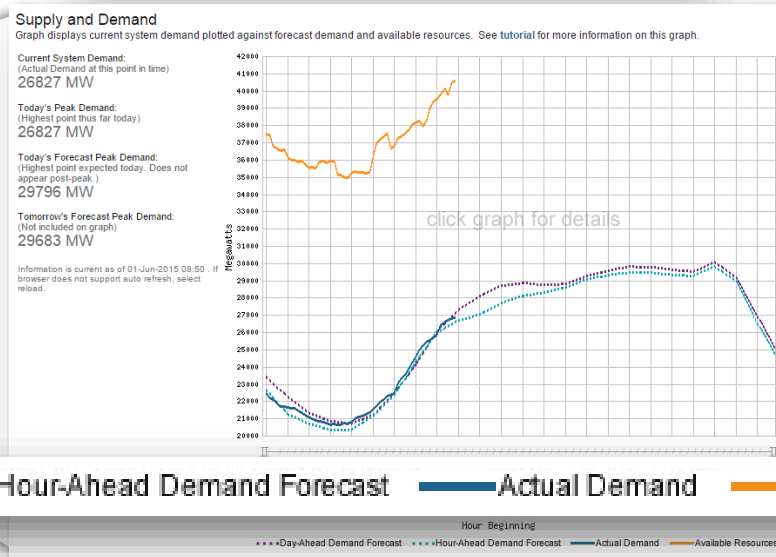
California's Clean Energy Future  
Market Participant Portal

STAY CONNECTED

**Today's Outlook** Mon Jun 1 08:54:06 2015

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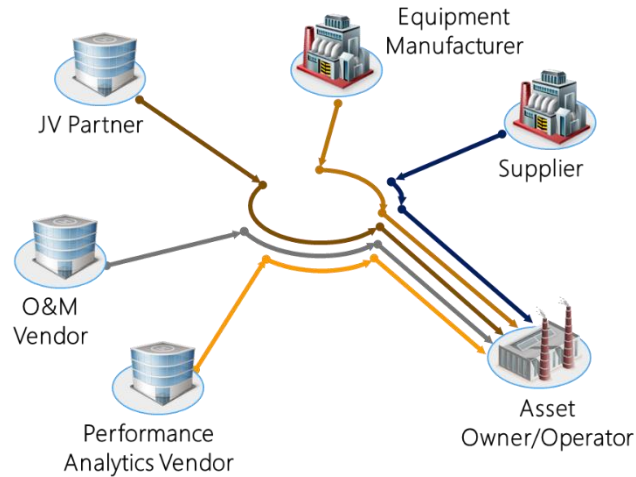
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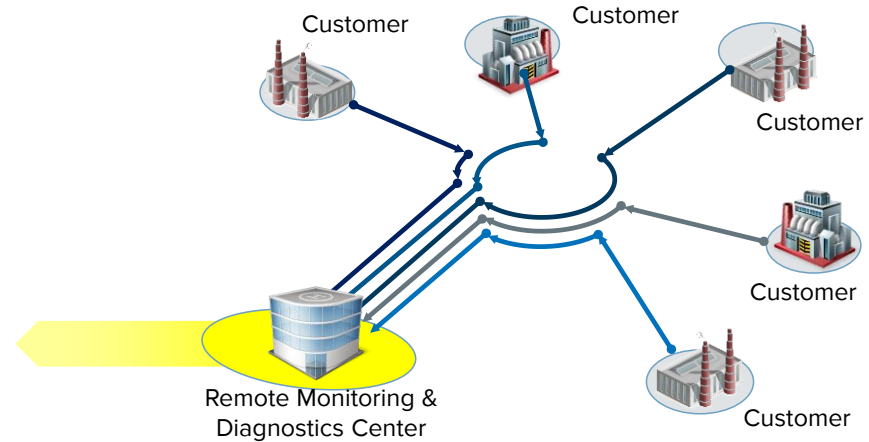
■ ■ ■ Day-Ahead Demand Forecast ■ ■ ■ Hour-Ahead Demand Forecast — Actual Demand — Available

# Integration: Leverage external expertise to deliver intelligence with Connected Services

## Multiple stakeholders...

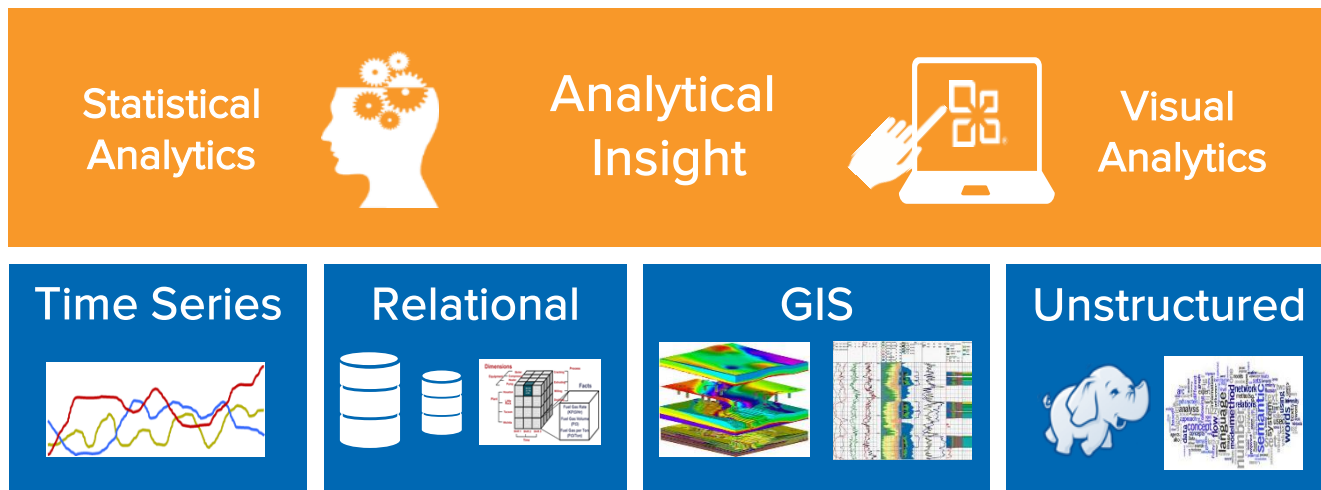


## ... a Service Provider perspective



Connected Services is a simple, secure, technical and **commercial framework** for **service providers** to obtain the data they need to drive service excellence

# Integration: Derive Big Data insights and intelligence from your PI System data



The Internet of Things Creates Big Data

The PI System let you Leverage Big Data for Insights



# Integration: Employ PI Integrators to gain Business Intelligence for the **Physical** World

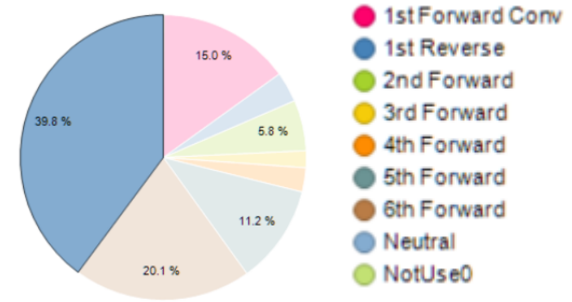


## 3 Contexts / 3 Perspectives

- Time-series: Time Focus
- Assets: Equipment Focus
- Events: Event Focus

PI  
Integrators

## Gear Select by Operator



2015-04-23 15:59:50	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:00:00	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:00:10	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:00:20	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:00:30	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:00:40	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:00:50	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:01:00	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:01:10	23.6547420812366	23.2147636153275	28.3663721651326



Video placeholder. See replays at  
[www.osisoft.com](http://www.osisoft.com) > Resources > View by Event  
to watch the videos.

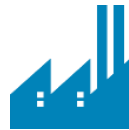
# Integration: Overcome the challenges to discovering insights



Increasing systems  
complexity



Scarcity of domain &  
industry expertise



Cost and resource  
constraints



Not everyone has direct access to information, leaving many potentially **impactful** insights **undiscovered**

# Noble Energy presents on the value of integrating data

## Our Approach Data as a Strategic Asset

### Gain New Insights Into Production Dynamics

- Across a wide variety of disparate data sources and variables such as well information systems, SCADA data, sensors, and unstructured data

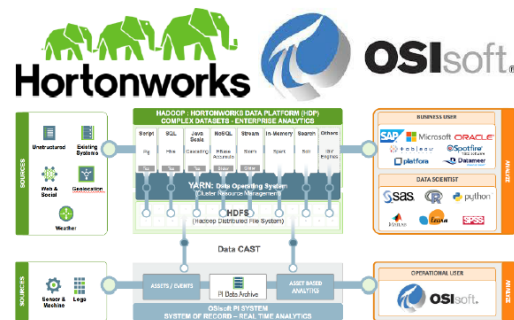
### Build Executive Consensus and Business Sponsorship

- Start with a single business unit – prove the value
- Recognition that data provides sustainable competitive advantage
- Widespread, systemic value creation because data is managed as professionally as capital or labor

### Rely on Trusted Partners to Assist

- Combination of Noble team members along with Hortonworks (Hadoop) and OSIsoft (PI / CAST)
- High performing operational and data science team (Python)

<http://www.osisoft.com/Templates/item-abstract.aspx?id=12337>



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# Devon presents on data integration

## What do we gain?

- BI tools become more responsive (Spotfire)
- Users can build queries ad hoc (SQL)
- Scheduled and ad-hoc reporting (SSRS)
- Historical data available to existing BI tools
- Real-time data in Hadoop
- Align data for BI within a common time scheme
- Enable unique uses for real-time data



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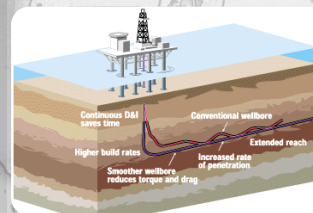


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Oil Assets



Liquids-Rich Gas Assets

Heavy Oil

Permian Basin

Anadarko Basin

Barnett Shale

Eagle Ford

# Integration: PI Integrator Roadmap - Q3 2015

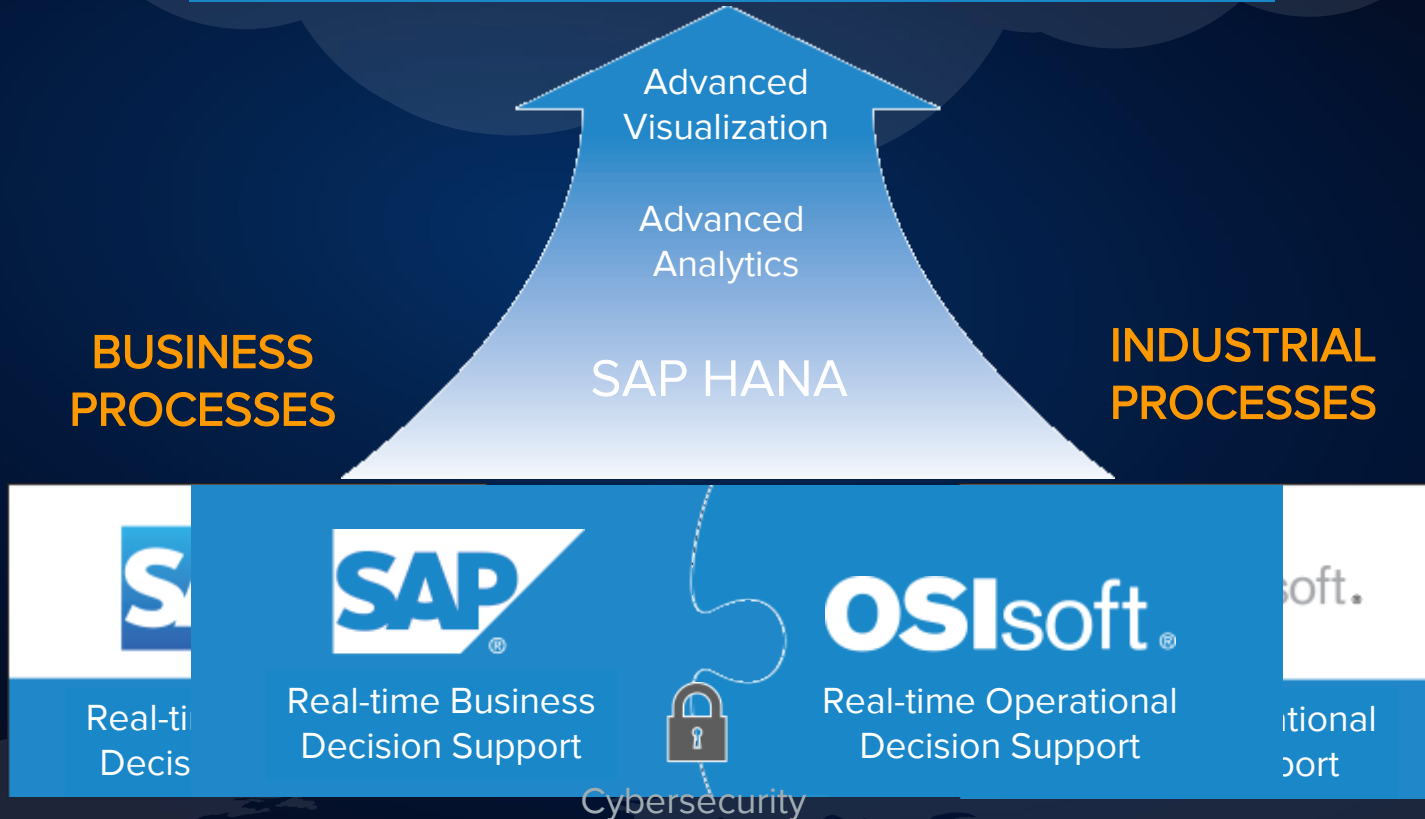
## PI Integrator for Business Analytics: BI Edition

- Create PI Views
- Access decision ready data via ODBC
  - First class support for Tableau, Tibco Spotfire, and Microsoft BI
  - Works with any software with an ODBC data source connection

## PI Integrator for SAP® HANA®

- Automatically creates Virtual Tables via Smart Data Access
- Native integration with SAP HANA
  - Linux and SAP HANA Cloud Platform
- Available through SAP

# Novel and Actionable Insights





We believe **People** with **Data** can **Transform** their world

# Transforming the value of data



Real-time Decision  
Support



System  
view



Individual  
view



Local  
view



Operation &  
Business insight

Business/Operation  
Intelligence



Group  
insight



Enterprise  
insight



감사합니다

谢谢

Danke

Merci

Gracias

**Thank You**

ありがとう

Спасибо

Obrigado



# Contact Information

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Systems Engineer

OSIsoft



# Questions

Please wait for the **microphone** before asking your questions



State your  
**name & company**

# Please don't forget to...

Complete the Survey  
for this session



The **Power of Data**  
DECISION READY IN REAL-TIME

## Evaluation Form (Seminar Location - Date)

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Email: \_\_\_\_\_

### Quality and content of the presentations

Poor Good Excellent N/A

Welcome	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Journey To Real-Time Operational Intelligence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Power of Connection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tank Level Management System	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using the PI System to Aid in Troubleshooting Operational Aspects of Oil and Gas Well Drilling and Completion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unleash your Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information on the Spot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wrap-up/Seminar Conclusion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Quality and organization of the seminar

Choice of date	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time allowed for lunch/breaks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Choice of presentations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Break and time allowed for the presentations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



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Bring your questions, comments, and suggestions!

