Transform Information into Intelligence

Presented by **Francois P. Bouchard, Systems Engineer**

Transforming the **value** of data

Data → Transform → Information → Transform → Intelligence

Real-time Decision Support

Business/Operation Intelligence

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?

Data

Transform

Information

Transform

Intelligence

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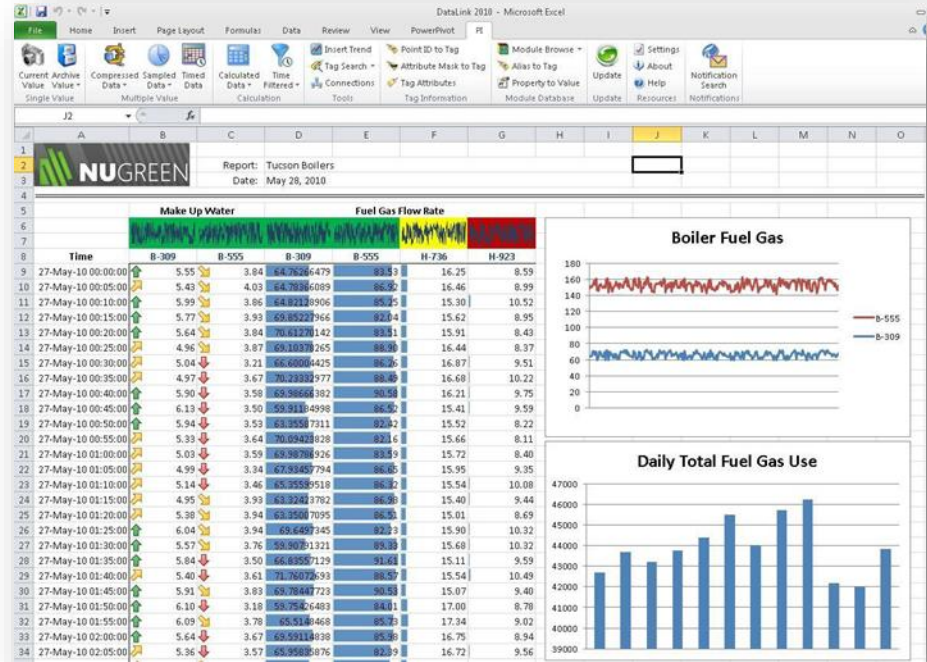
Enabling Investigation

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

	B	C
AF Database		\\DFDELOREAN\Petrolux
Search Start		3/10/2014
Search End		5/1/2014
Event Name		*
Event Template		*
Element Name		*
# Events:		0
# Attributes:		0

LIVE Drill Rig Events

PI DataLink & PI Event Frames

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

Current Value | Archive Value | Compressed Data | Sampled Data | Timed Data | Calculated Data | Time Filtered | Explore | Compare | Search | Asset Filter | Properties | Update | Settings | About | Help | Notification Search

Single Value | Multiple Value | Calculation | Events | Search | Properties | Update | Resources | Notifications

C8 — Drill Rig 2

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
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\Petrolux		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	-95.143
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 12:57:18	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		169.6479
			Drill Rig 1												
10		# Events:	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	8.55377708		
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		174.3337
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	8.648765854		
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	8.649557894		
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	8.681498964		
33					Stick-Slip - Drill Rig 2 - 2014-03-30 23:52:26	30-Mar-14 23:52:26	31-Mar-14 00:26:13	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		

READY

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

Event detection
Root cause event identification

A scalable event Infrastructure

Exploring & comparing events in Excel
Ad-hoc reporting

Reporting &
BI integration
3rd party integration

Event Generation

Event Database

Event Visualization

Event Integration

Hierarchical & batch event generation

Event storage
Related data
Calculations
Event auditing

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

SOAP access
Mobile app compatibility
Programmatic access

Integrating Information to Drive Insights

OSIsoft.

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

PRODUCTION	DEMAND	ENVIRONMENT
Are we on track to hit our production targets?	How much power will our customers need in the next 24 hours?	Are there enough units online to handle the storm?
Do the fiscal projections justify deviating from standard operation?	How much material are we obligated to deliver?	Is there an abnormal heat wave that will compromise the grid?

Historical

Real-Time

Future Data

Integration: Integrate forecasts directly into your PI System

Integration: Leverage external expertise to deliver intelligence with Connected Services

Multiple stakeholders...

JV Partner
Equipment Manufacturer
Supplier
O&M Vendor
Performance Analytics Vendor
Asset Owner/Operator
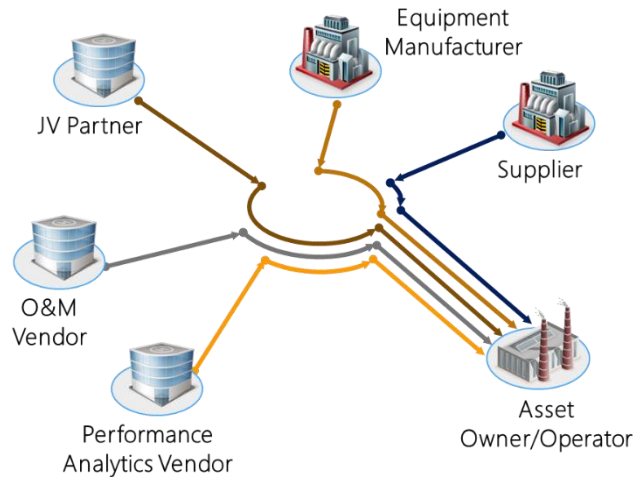
... a Service Provider perspective

Customer
Customer
Customer
Customer
Customer
Customer
Remote Monitoring & Diagnostics Center
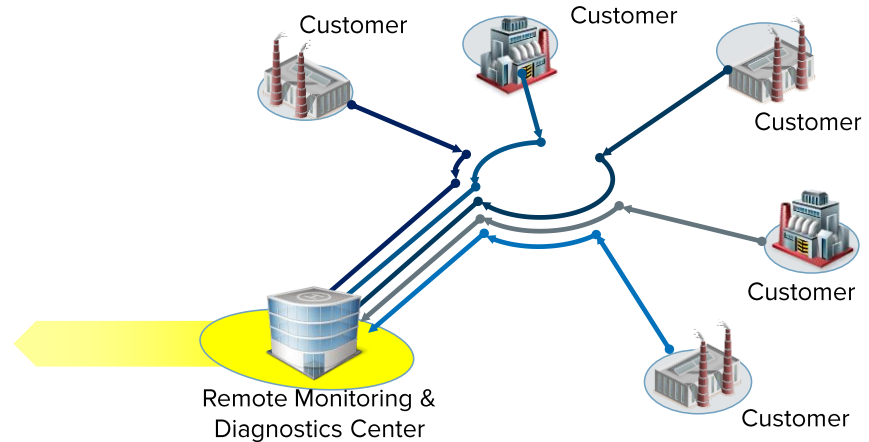
Connected Services is a simple, secure, technical and **commercial framework** for **service providers** to obtain the data they need to drive service excellence

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

Statistical Analytics — Analytical Insight — Visual Analytics

Time Series — Relational — GIS — Unstructured
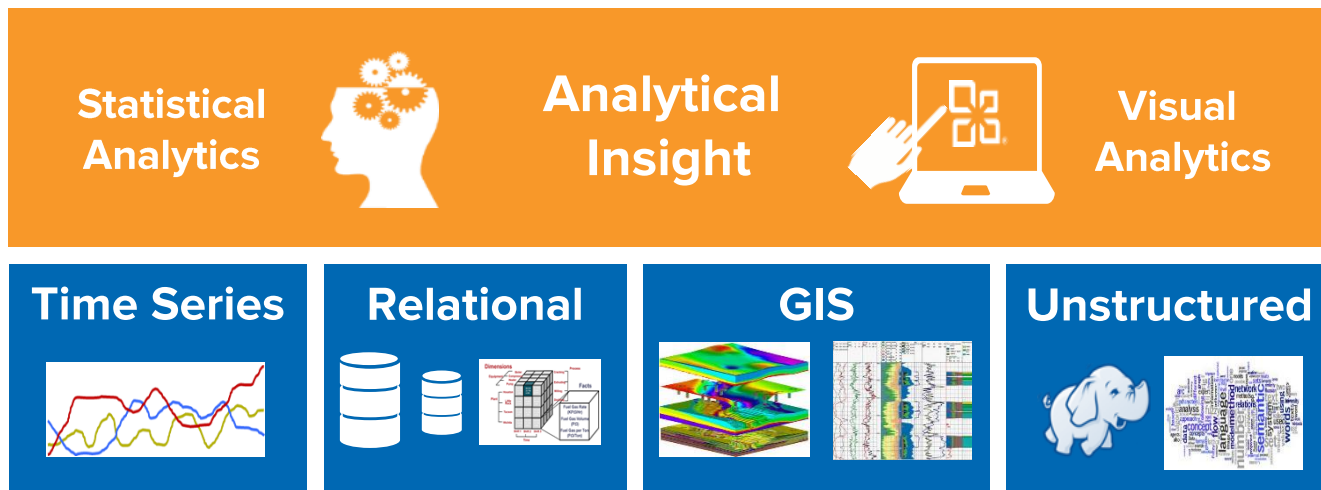
The Internet of Things Creates Big Data

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

- 1st Forward Conv
- 1st Reverse
- 2nd Forward
- 3rd Forward
- 4th Forward
- 5th Forward
- 6th Forward
- Neutral
- NotUse0

15.0 %
5.8 %
39.8 %
11.2 %
20.1 %
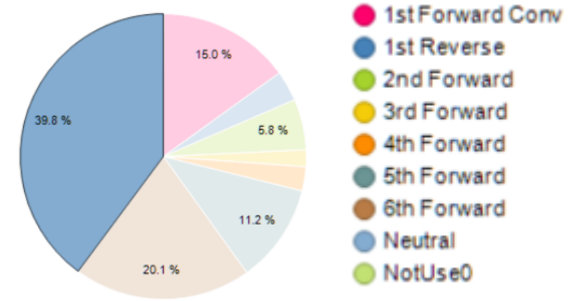
2015-04-23 15:59:50	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:00:00	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:00:10	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:00:20	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:00:30	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

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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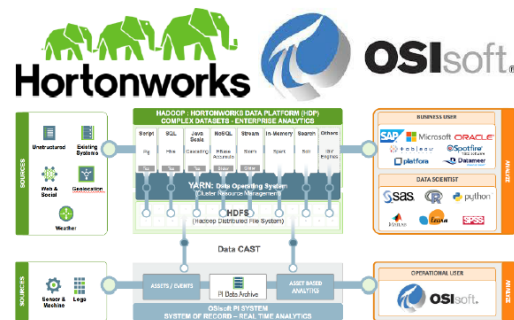
Devon presents on data integration

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

Heavy Oil

Anadarko Basin

Barnett Shale

Permian Basin

Eagle Ford

Oil Assets

Liquids-Rich Gas Assets

http://www.osisoft.com/Templates/item-abstract.aspx?id=12342
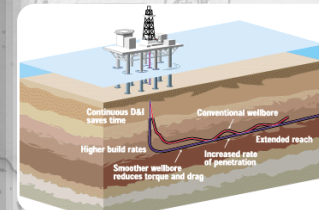
Integration: PI Integrator Roadmap - Q3 2015

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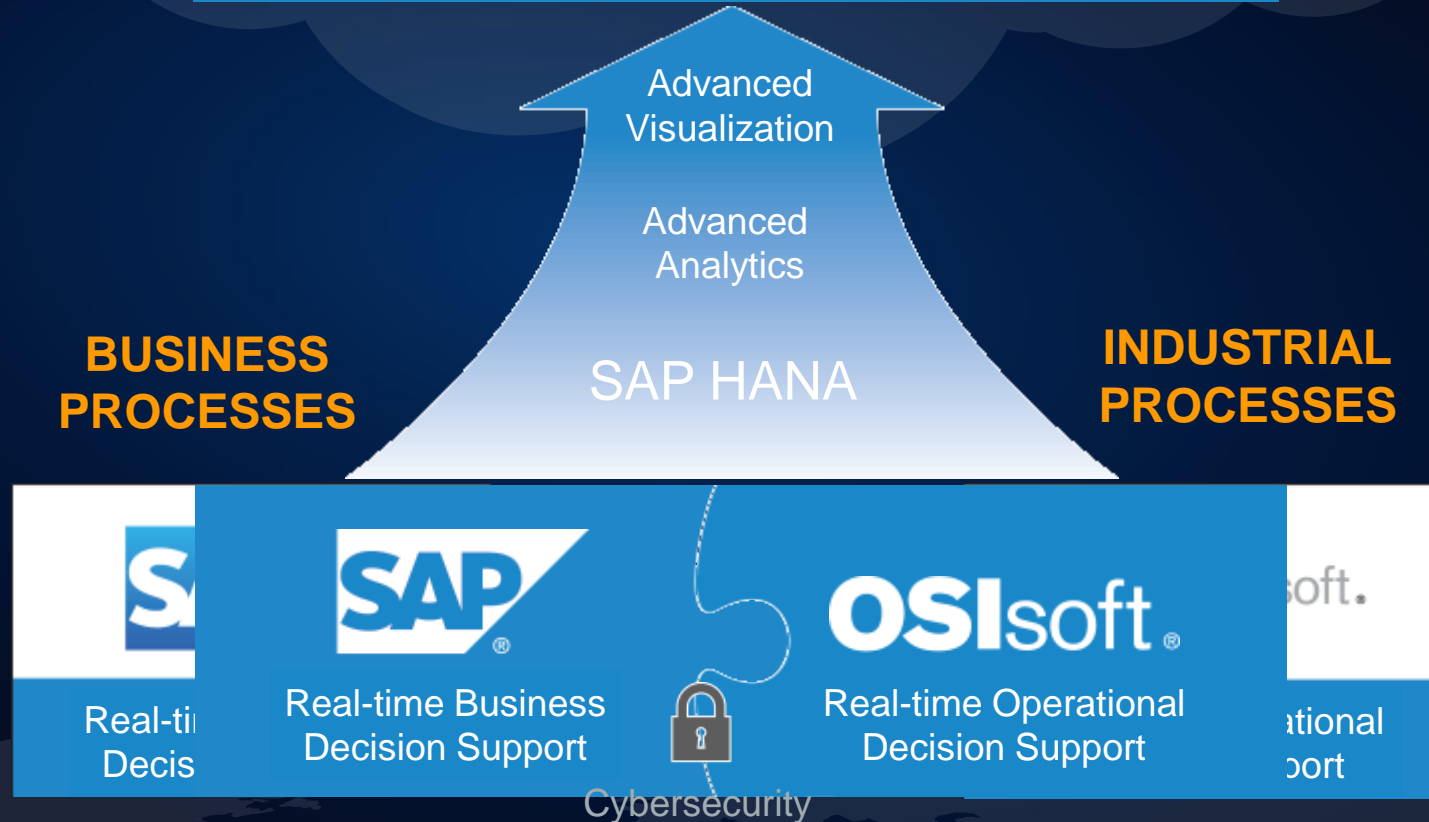
We believe **People** with **Data** can **Transform** their world

OSIsoft.

Transforming the value of data

Data   Transform   Information   Transform   Intelligence

Real-time Decision Support

Business/Operation Intelligence

System view   Individual view   Local view   Operation & Business insight   Group insight   Enterprise insight

감사합니다

谢谢

Danke

Gracias

Merci

Thank You

ありがとう

Спасибо

Obrigado

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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	○	○	○	○
The Journey To Real-Time Operational Intelligence	○	○	○	○
The Power of Connection	○	○	○	○
Tank Level Management System	○	○	○	○
Using the PI System to Aid in Troubleshooting Operational Aspects of Oil and Gas Well Drilling and Completion	○	○	○	○
Unleash your Infrastructure	○	○	○	○
Information on the Spot	○	○	○	○
Wrap-up/Seminar Conclusion	○	○	○	○
Quality and organization of the seminar				
Choice of date	○	○	○	○
Time allowed for lunch/breaks	○	○	○	○
Choice of presentations	○	○	○	○
Pace and time allowed for the presentations	○	○	○	○

Come See Us At The Pods!

Bring your questions, comments, and suggestions!