



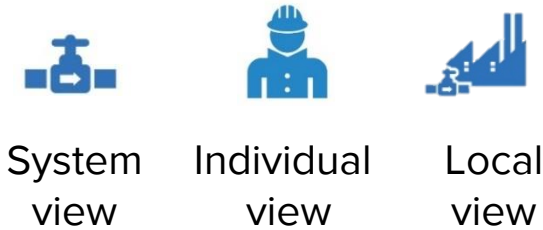
Transform Information into Intelligence

Presented by Philip McKanna

Transforming the value of data



Real-time Decision
Support



Business/Operation
Intelligence



Information to intelligence: Insights to drive decisions



Transform



Transform



Context: Data without context is meaningless

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

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

- **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

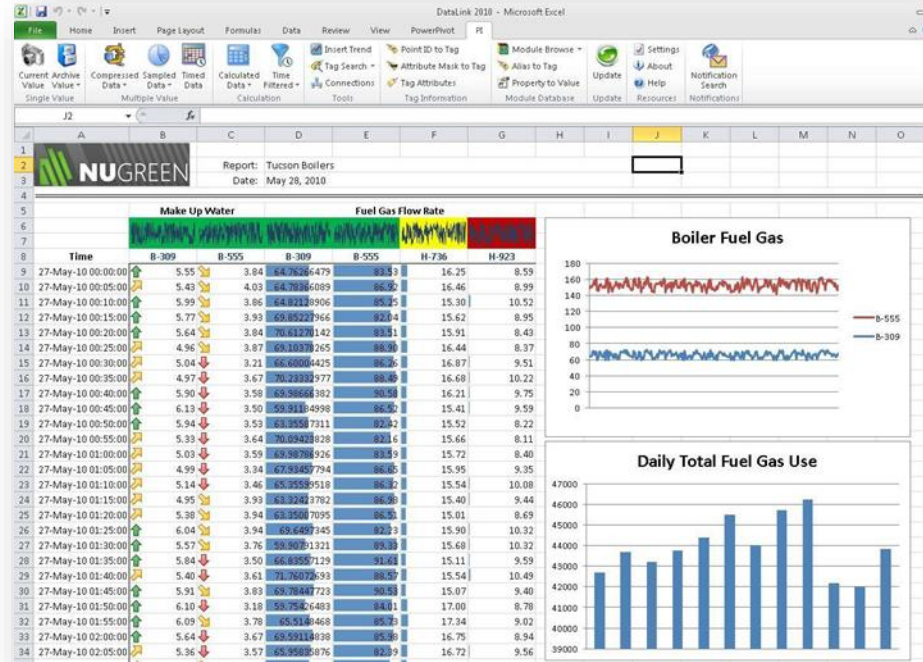
Asking How & Why: PI DataLink provides seamless PI System access within Microsoft Excel

Create novel insights

Perform rapid investigation

Add-in to Microsoft Excel

- Create Reports
- Apply Calculations
- Retrieve data



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
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	*													
9																
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

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
3rd 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 Panel

QUICK LINKS

Board
Business Practice Manuals
Careers
Tariff

STAY INFORMED

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

RELATED WEBSITES

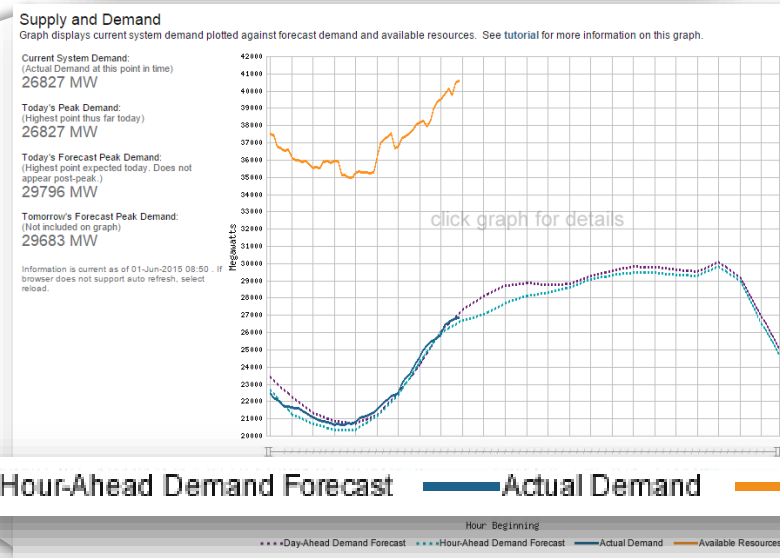
California's Clean Energy Future
Market Participant Portal

STAY CONNECTED

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

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

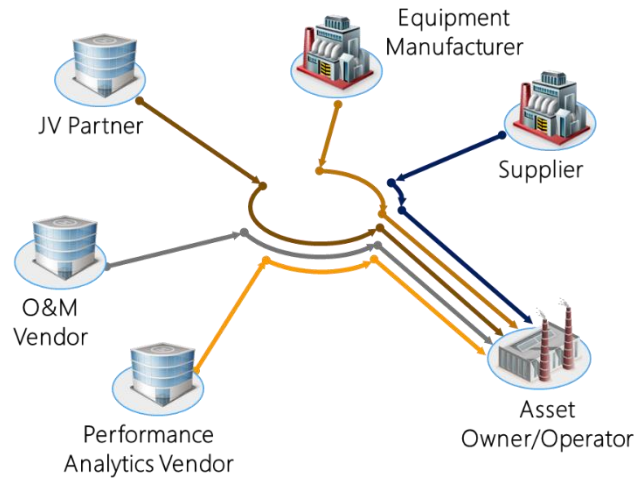
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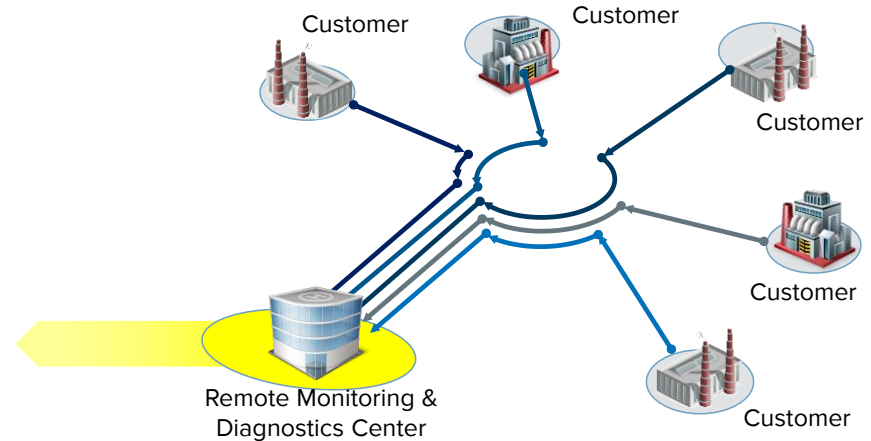
■ ■ ■ Day-Ahead Demand Forecast ■ ■ ■ Hour-Ahead Demand Forecast — Actual Demand — Available

Integration: Leverage external expertise to deliver intelligence with Connected Services

Multiple stakeholders...

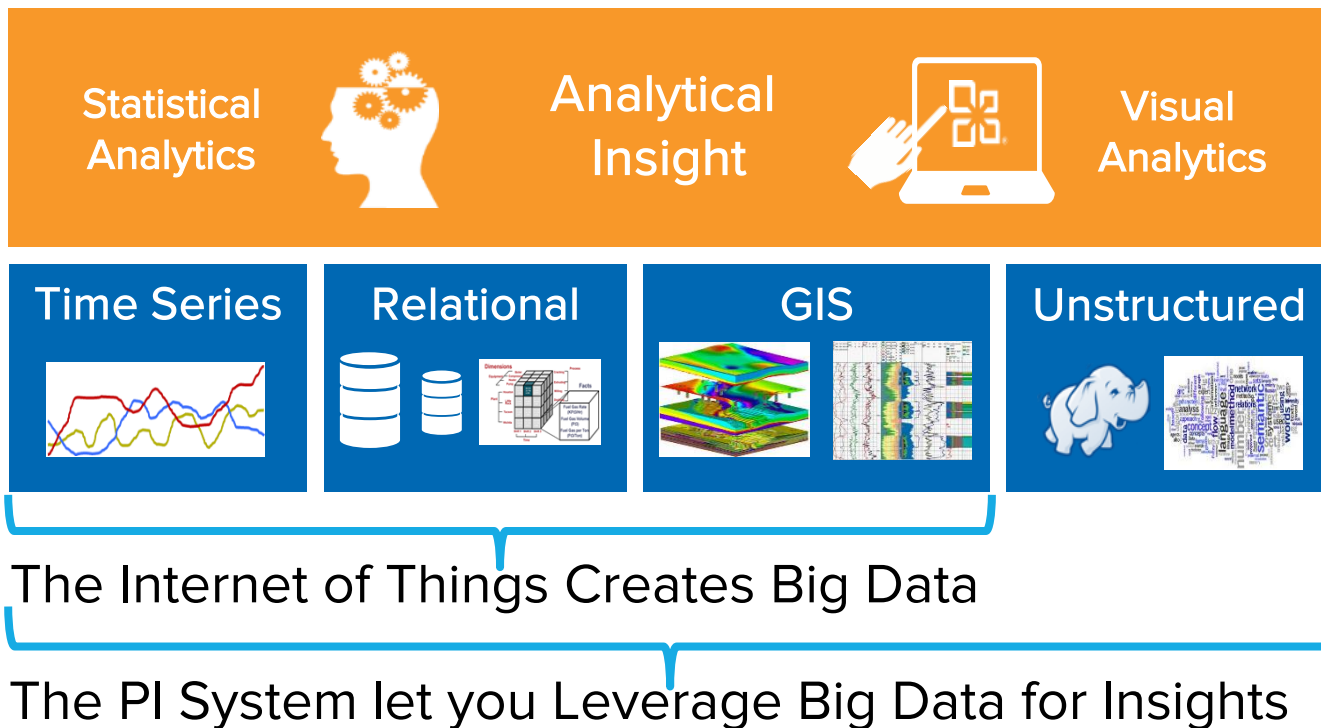


... a Service Provider perspective



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



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

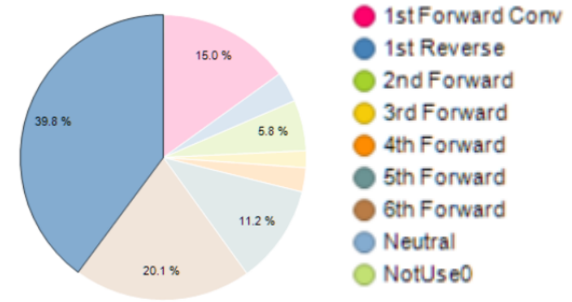


3 Contexts / 3 Perspectives

- 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

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

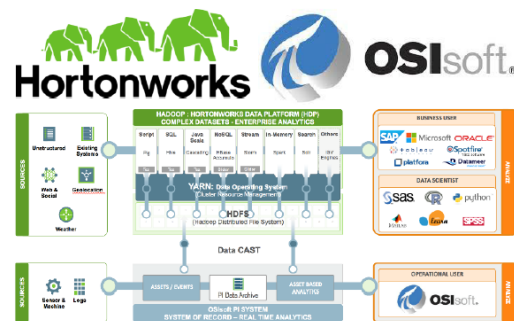
Build Executive Consensus and Business Sponsorship

- 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)

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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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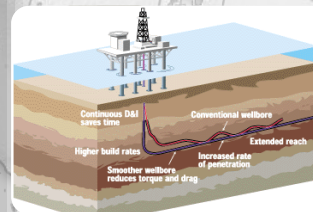


OSIsoft

REGIONAL SEMINARS 2015

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Oil Assets



Liquids-Rich Gas Assets

Heavy Oil

Permian Basin

Anadarko Basin

Barnett Shale

Eagle Ford

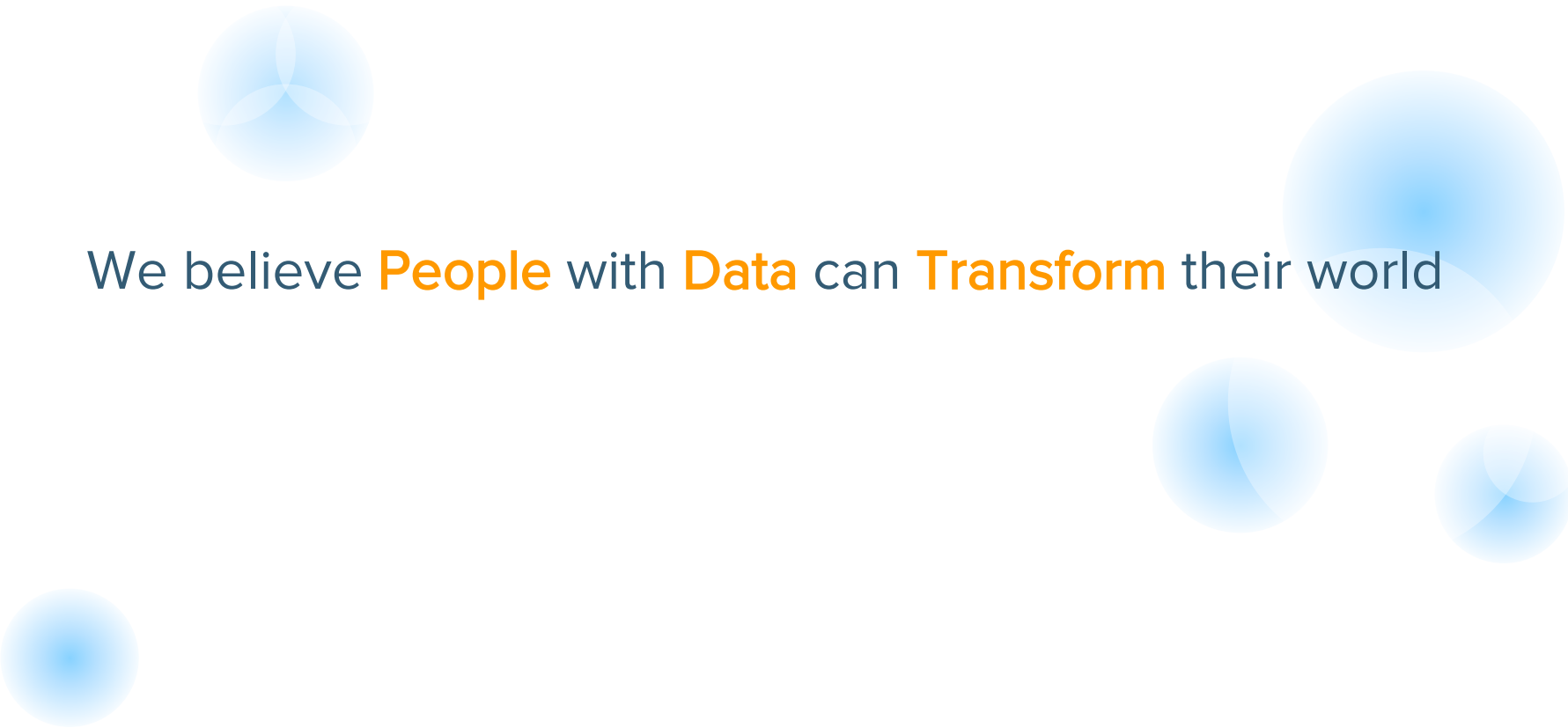
Integration: PI Integrator Roadmap - Q3 2015

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 (Excel, PowerPivot, Power View, Power BI)
 - Works with any software with an ODBC data source connection

PI Integrator for SAP® HANA®

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



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



Questions

Please wait for the
microphone before
asking your question

Please state your name
and your company



Come See Us At The Pods!

Bring your questions, comments, and suggestions!

