PI System Roadmap – Evolving the PI System

Presented by Brian McMorrow
Product Management

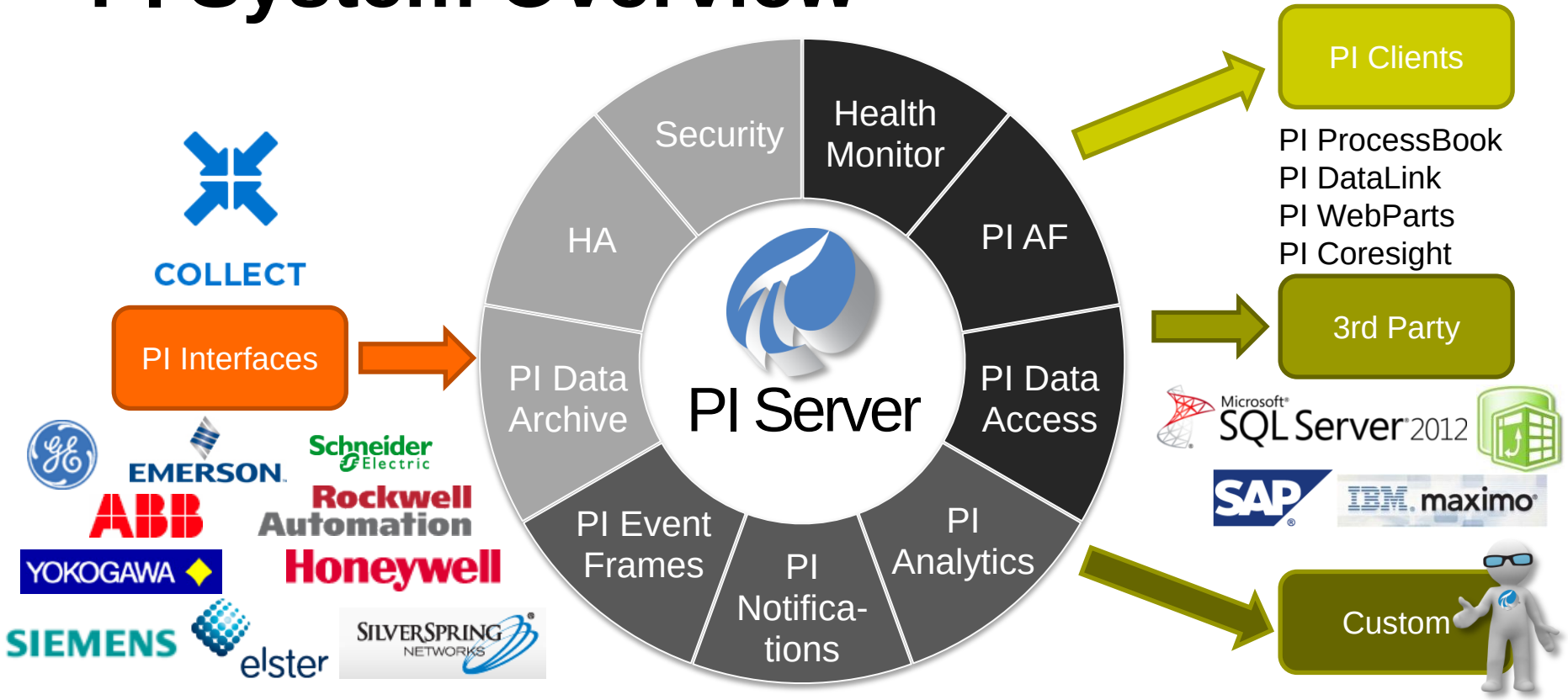
Agenda and Expectations

- This presentation assumes:
  - You know the PI System basics
- What is coming to the PI System
  - Now → 18 months
- Few specific dates – check PI System Roadmap (see example)
- All information is subject to change
- We want your feedback and suggestions!

“Every day I wake up and ask, ‘how can I flow data better, manage data better, analyze data better?’”

Rollin Ford, CIO Wal-Mart

PI System Overview



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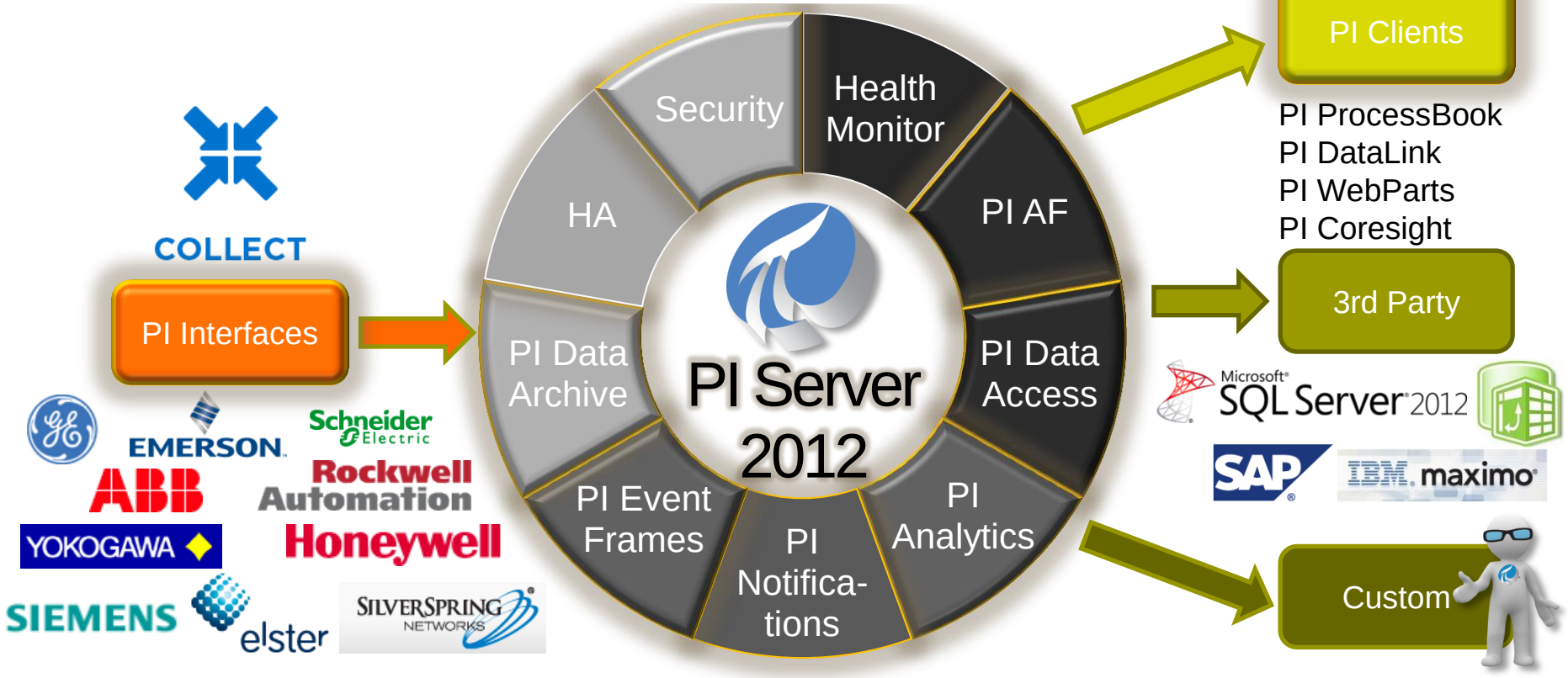
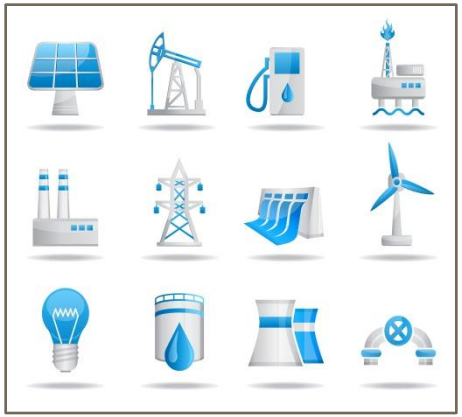


PI System Themes

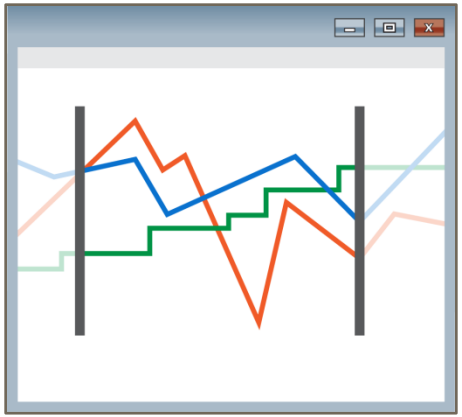
Scale

More data
Fast Performance
More robust



Asset-Centric PI

Manage data via
Asset context –
Reuse many times



Event Frames

Identify and use
important events
and related data

Visualization

Many roles
Different formats
Any device

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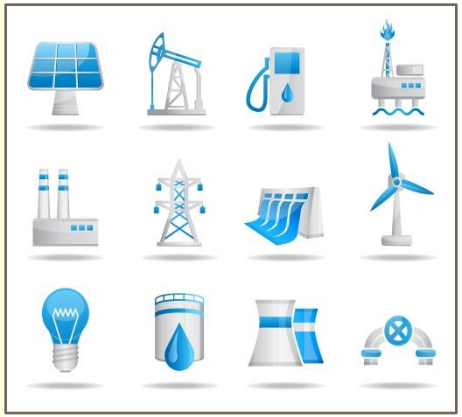
More robust



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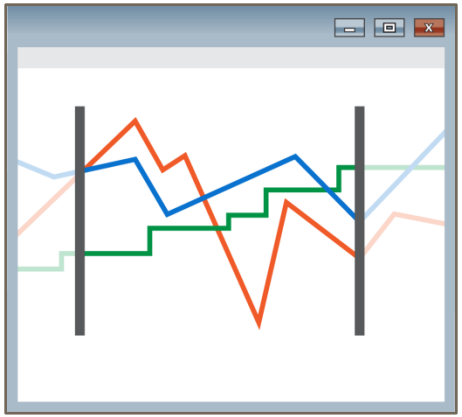

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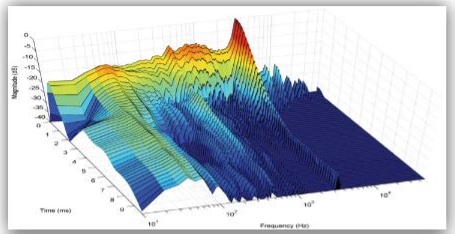
PI SERVER 2012

(SCALABILITY: 20+ MILLION PI TAGS)



Syncro Phasors

430TB

4.8K data streams, 120Hz
3 years online
Unique Events: 55 Trillion
Estimated Data: 430TB

Data Center

840TB

100K cells, 2M breakers
10 years online
Unique Events: 105 Trillion
Estimated Data: 840TB

Automated Metering

1,410 TB

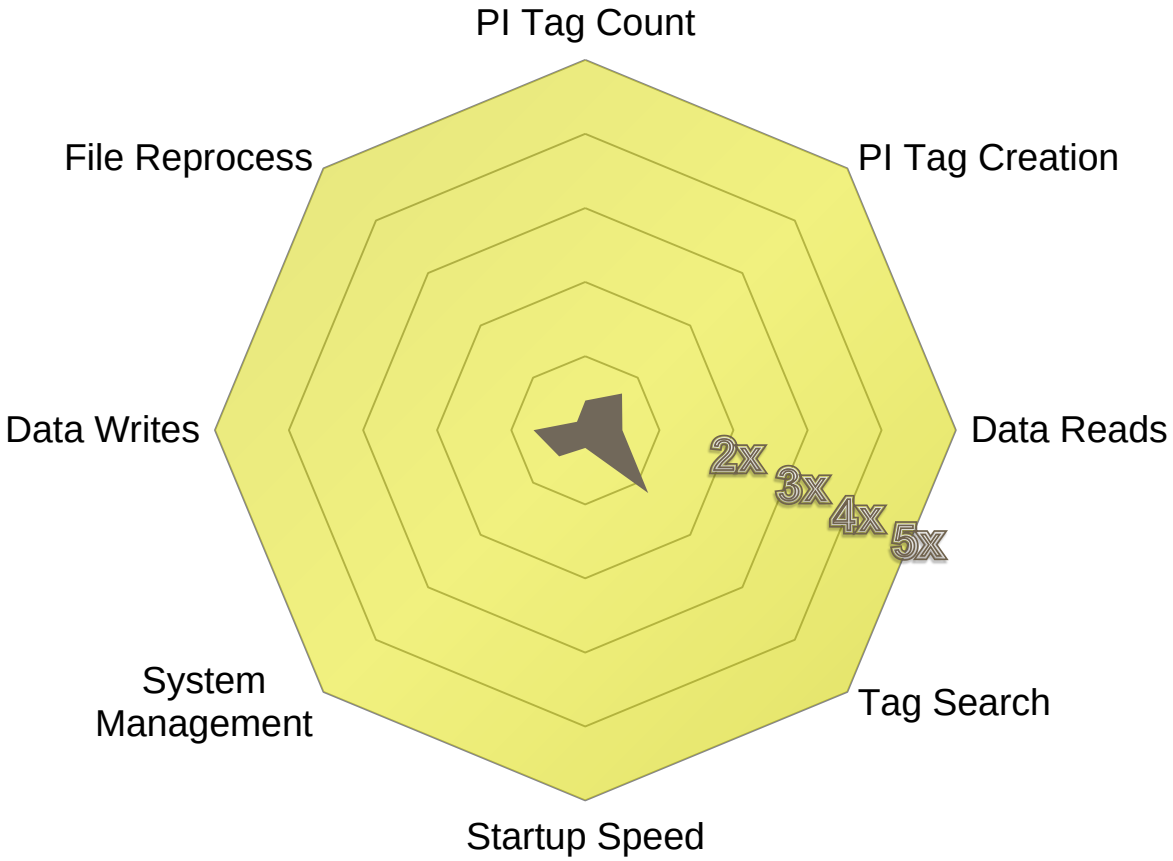
20M meters, 5-min reads
7 years online
Unique Events: 177 Trillion
Estimated Data: 1,410TB

Fleet Monitoring

50,460 TB

1K assets, 1M points
10 years online
Unique Events: 6,307 Tr
Estimated Data: 50,460TB

Performance Parameters



5x

PI Server 2012

PI Server 2010

CERTIFIED FOR Windows Server 2008 R2

2012 vs. 2010: The Final Sheet

	2012	2010	Delta
Max Point Count	20M+	2-3M	5-10x
Startup Time	<30 sec/Mpts	>10 min/Mpts	20x
Point Creation	500-2K pt/sec	<100 pt/sec	5-200x
Tag Searching	Linear	Non-Linear	N/D
Max Update Signups	10M+	<200K	50x
Update Signup Rate	>100K/sec	<2K/sec	50x
Data Out (Archive)	>10M ev/sec	<1M ev/sec	10-20x
Data In (Snapshot)	>1M ev/sec	<200K ev/sec	5-10x
Data In (Archive)	>500K ev/sec	<100K ev/sec	5-10x
Archive Shifts	<10 sec/GB	>1 min/GB	6-12x
Online Archives	>50K files	<10K files	5-10x
Backup Speed	<1 min/GB	>5 min/GB	5-10x
Offline Reprocessing	30 sec/GB	>15 min/GB	30x

Example of PI AF SDK Improvement

We have been able to write 21,200 points in 0.1 seconds to the PI Server 2012

"Clean" environment	"New" PI AF SDK Broker	"Old" PI SDK Broker
Startup	67 sec.	334 sec.
Restful memory utilization	250 KB	411 KB
Active memory utilization	281 KB	697 KB
Read time per point	5 µsec.	40 µsec.
Write time per point	50 µsec. (average)	830 µsec.

"RBC_SCC" environment	"New" PI AF SDK Broker	"Old" PI SDK Broker
Startup	109 sec.	310 sec.
Restful memory utilization	365 KB	1116 KB
Active memory utilization	450 KB	1500+ KB
Read time per point	5 µsec.	40 µsec.
Write time per point	50 µsec. (average)	830 µsec.

PI System Themes

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More robust

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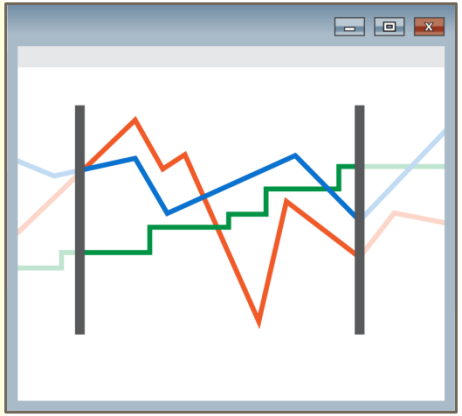

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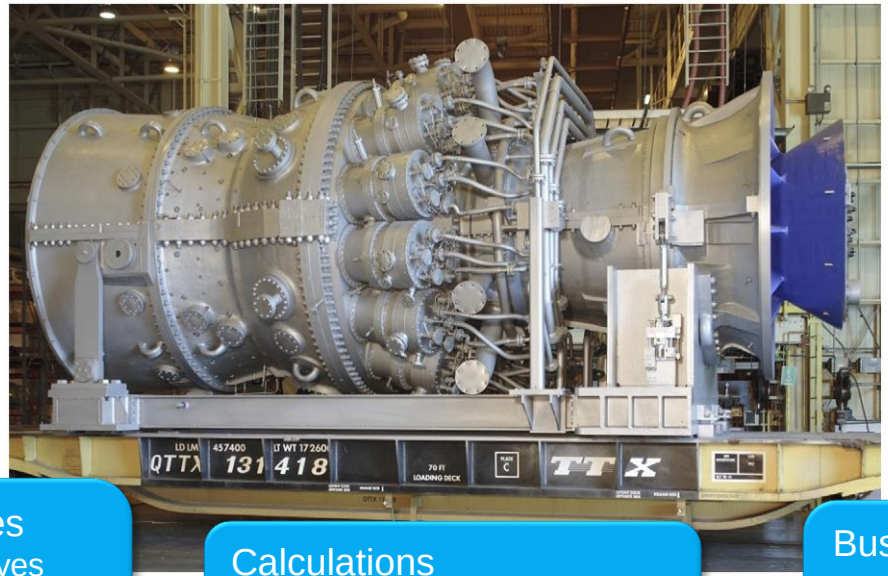
A Complete Picture of Your Asset

Real-time values
- Inlet pressure
- Inlet flow
- Ambient temperature

Asset details
- Name
- Make
- Model

External Databases
- Performance curves
- Last service date
- Design documents
- Inspection best practice



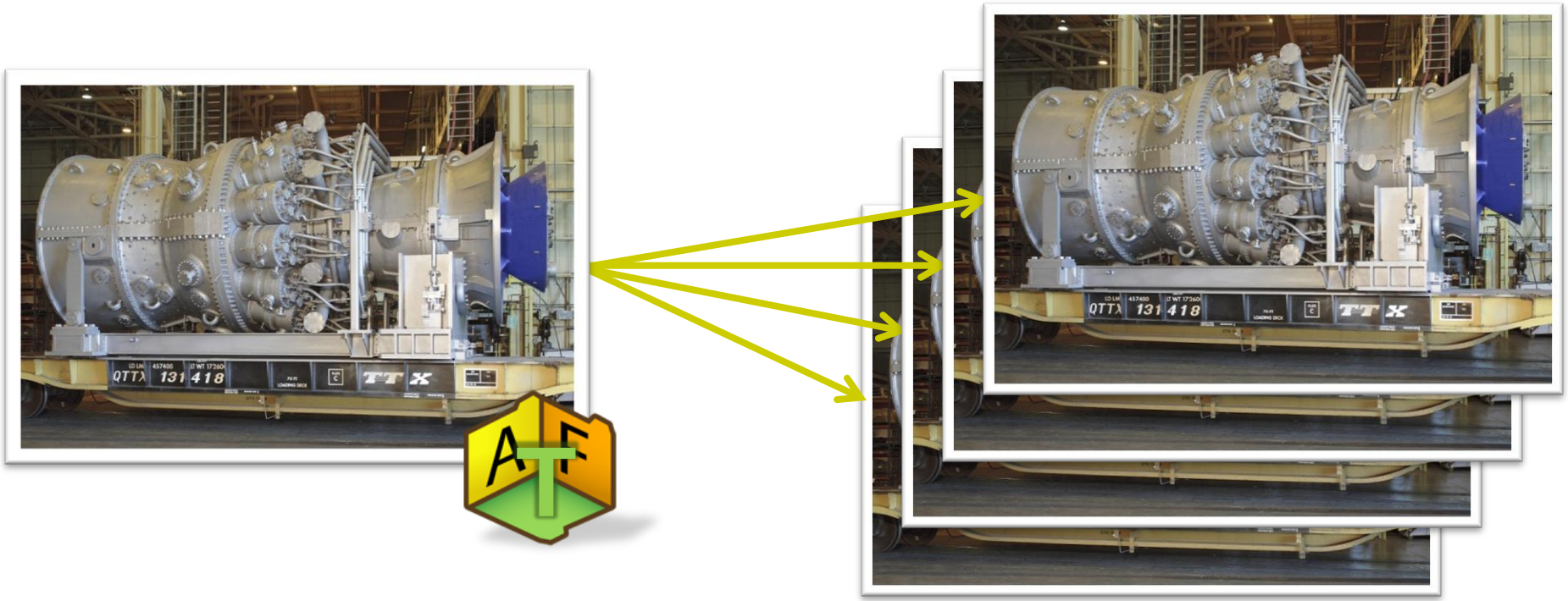
Calculations
- Performance calculations
- KPI's

Real-time Values
- Exhaust temperature
- Exhaust flow
- Measured MW output

Notifications
- Performance excursions
- Temperature difference
- High temperature

Business Events
- Downtime
- Startup
- Excursions

A Common View for Similar Assets



Asset-centric Visualization

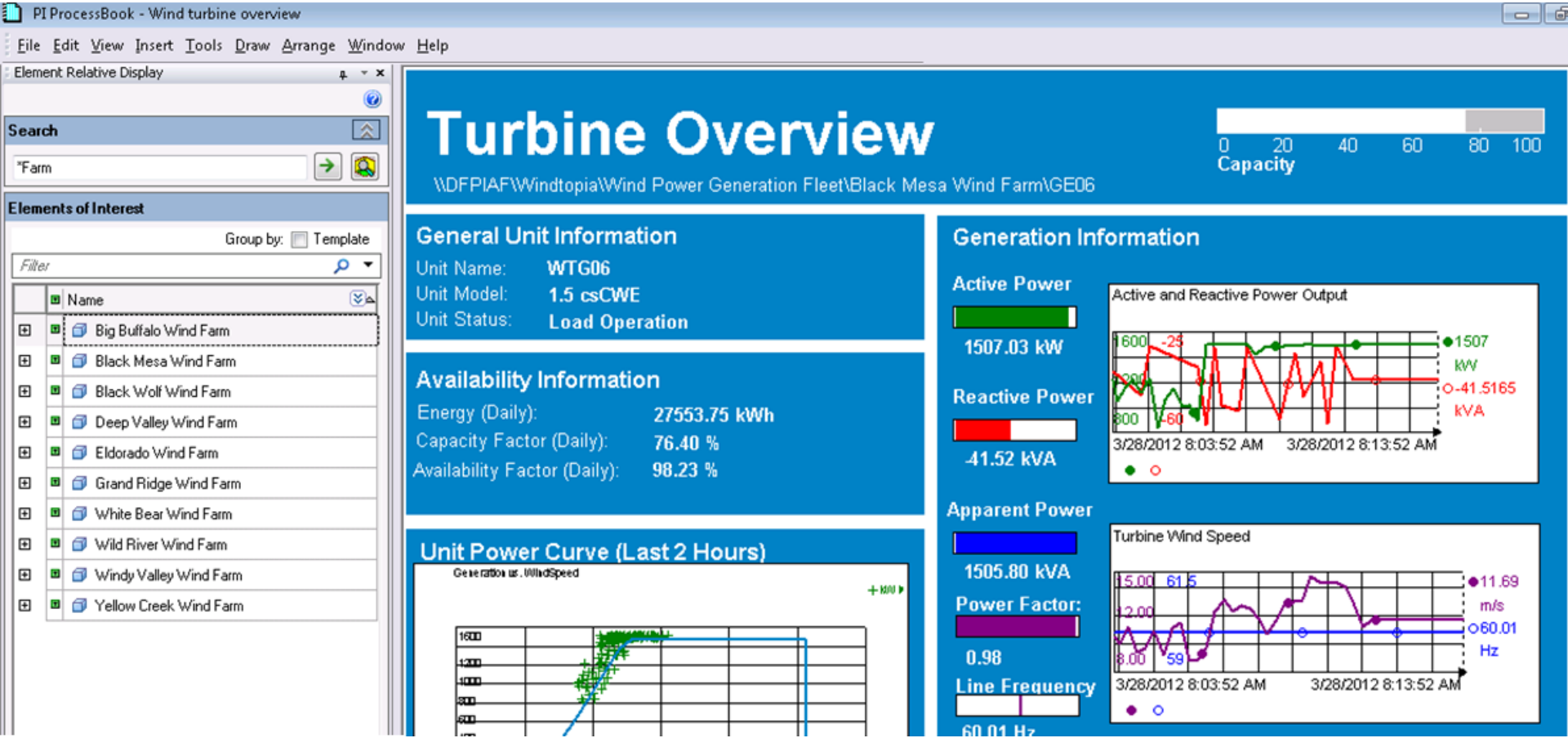
PI Coresight:
Ad Hoc Analysis & Collaboration

PI WebParts: Composite Apps, Shared broadly

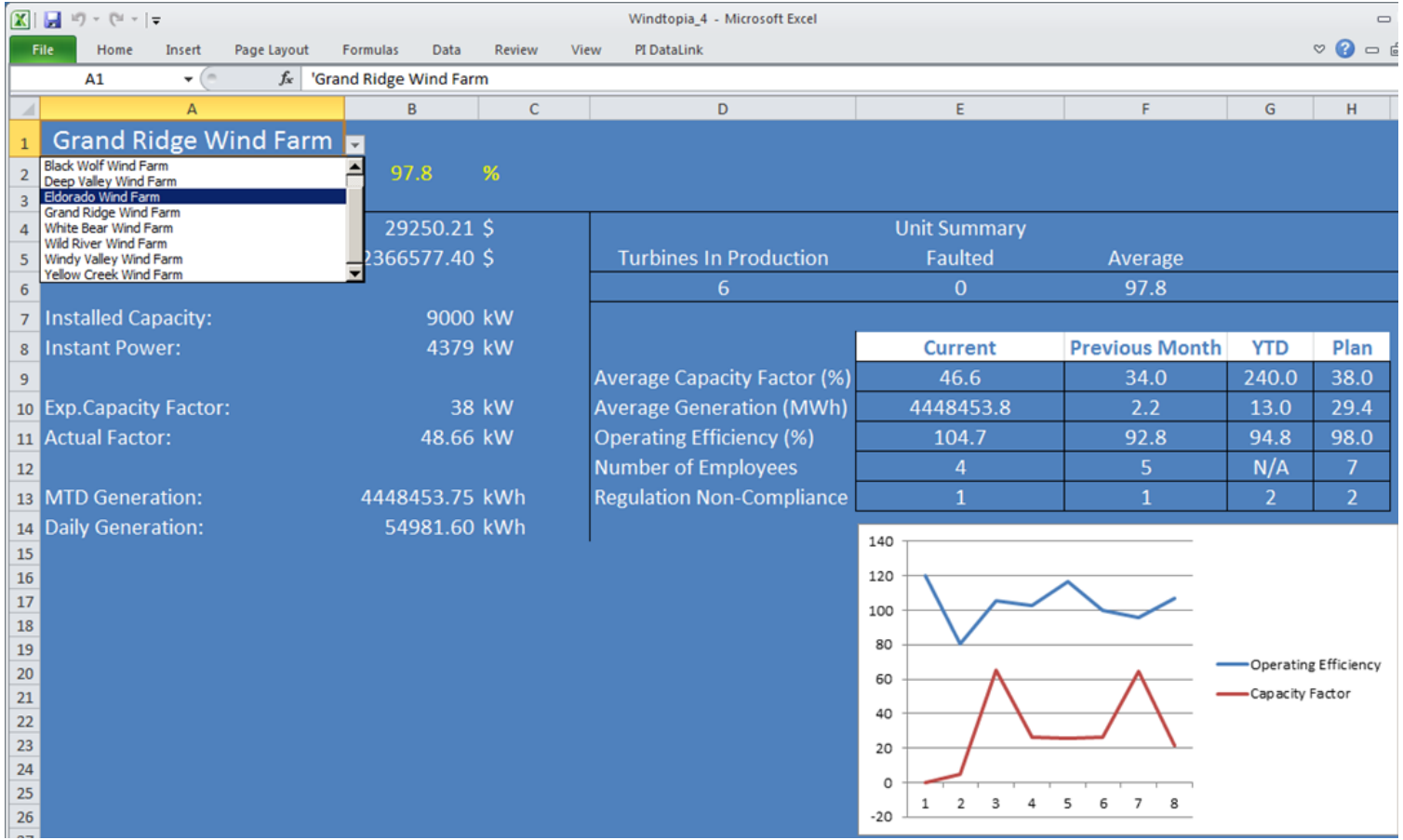
PI ProcessBook:
Display authoring and Process monitoring

PI DataLink:
Reporting and analytics in Microsoft Excel

Asset-centric displays in PI ProcessBook 2012



Asset-relative reports in PI DataLink 2012



Consolidate and share with PI WebParts

Explore assets with PI Coresight

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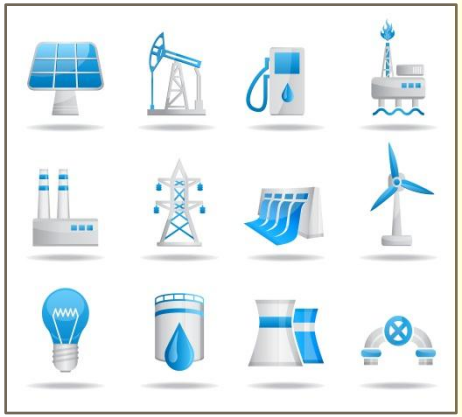

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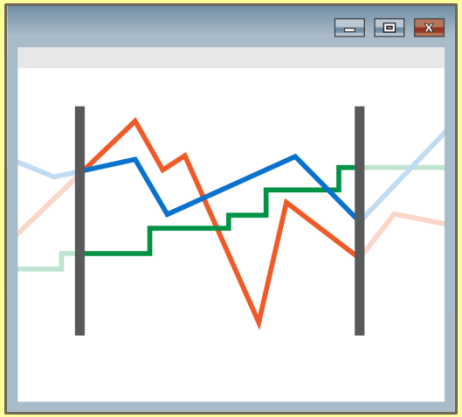

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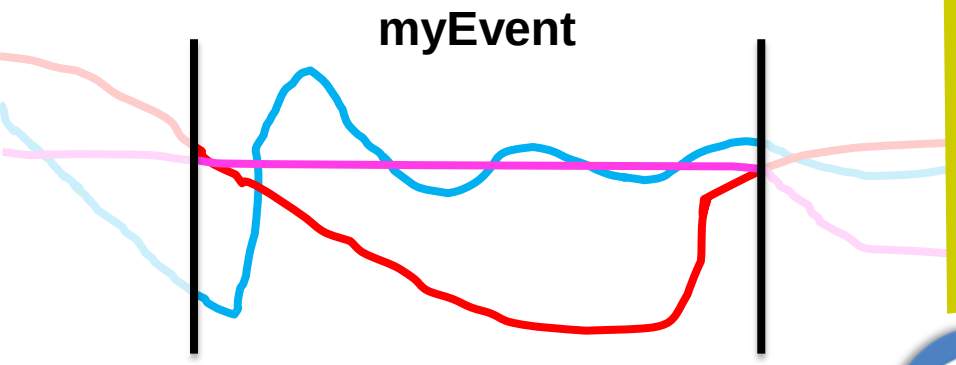
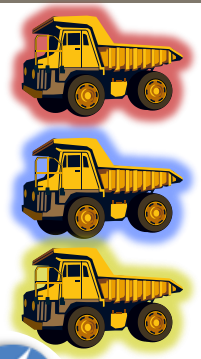
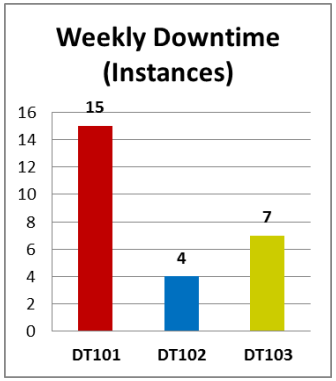
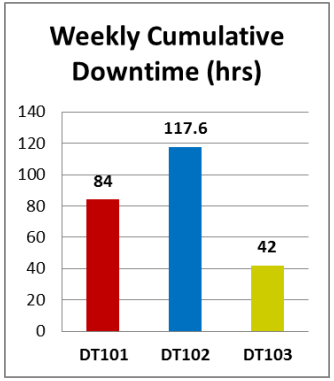
Simplify Data Analysis



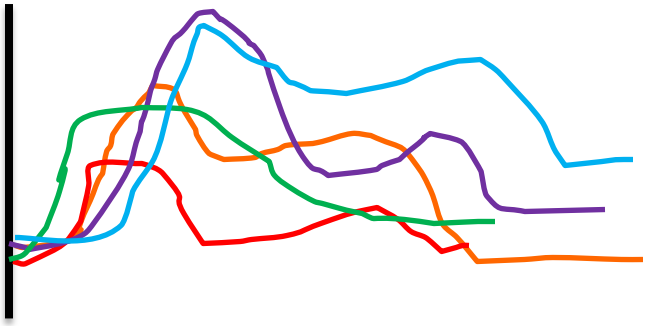
Perform Asset Comparisons







Event Overlay Trend (Temp)

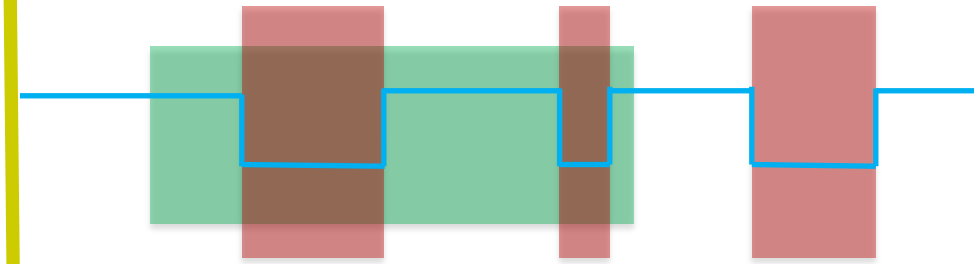


Name	Temp.Max
EF1	122.47
EF2	109.34
EF3	112.73
EF4	98.61
EF5	125.24

Downtime Events for Product XYZ

Product XYZ (1)

Downtime (2)

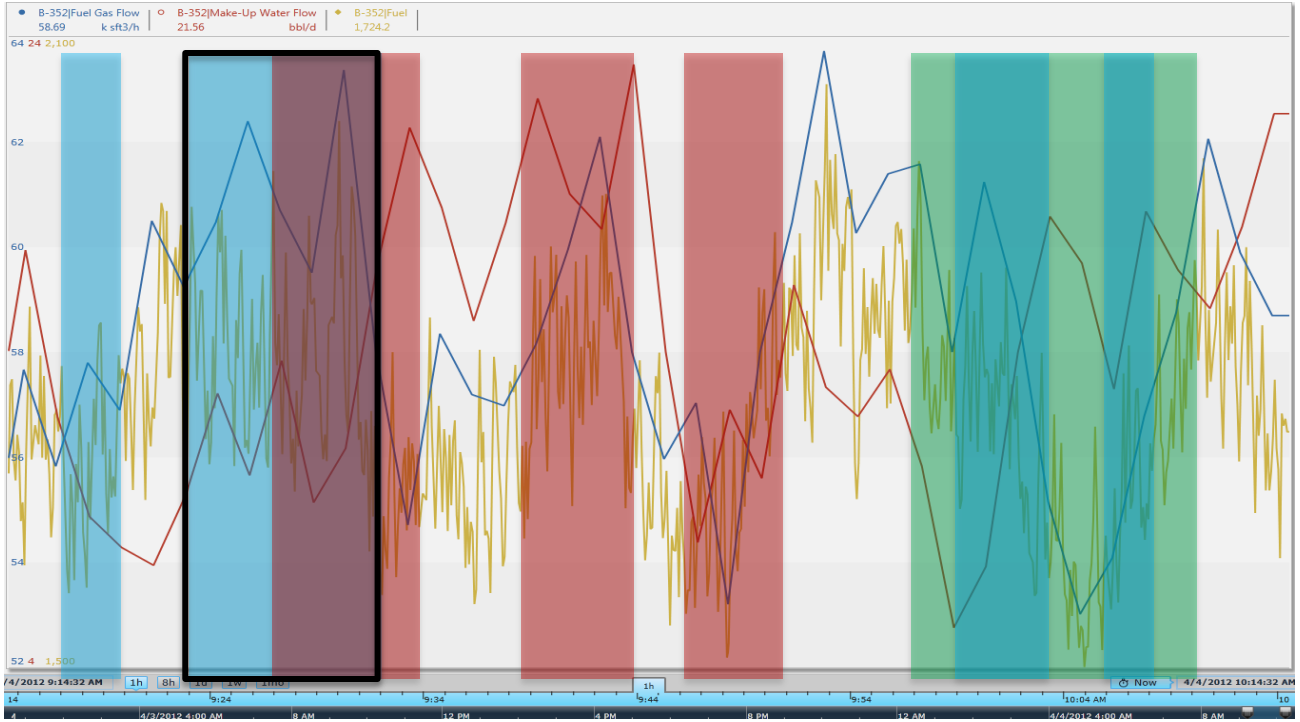


Perform Event Comparisons

Discover Event Interrelationships

PI Event Frames = *events* + *related data*

Excursions (4) Downtime (3) Product XYZ (1)

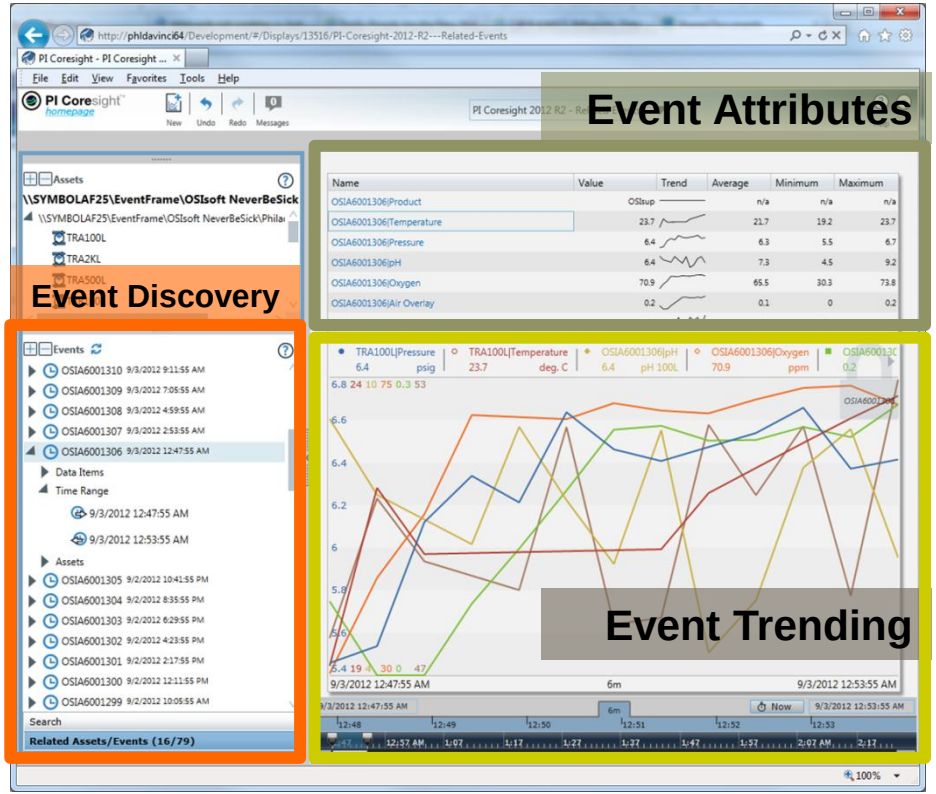


Event Attribute	Value
Name	Ex 20121215-0002
Start	15-Dec-2012 10:35:02
End	15-Dec-2012 10:47:26
Duration	12 min, 24 sec
Asset	Boiler-459
Excursion Type	High Violation
Fuel Gas Flow.Avg	37.12 k sft3/h
Fuel.Start	823.48 k sft3/ton
myPIKPI.Max	47.19 bbl/d

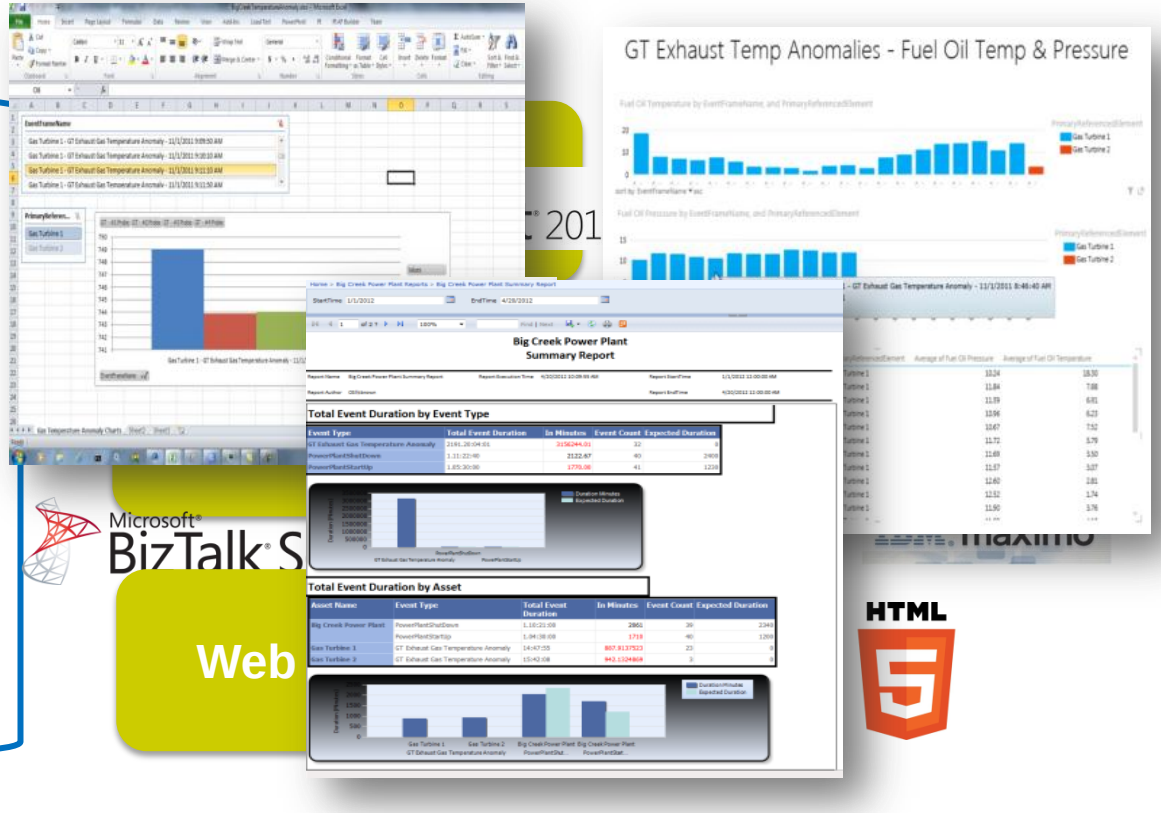
PI Coresight 2012 R2 – Related Events

The first PI Client to support PI Event Frames.

- **Event Discovery**
- **Event Attributes**
- **Event Trending**



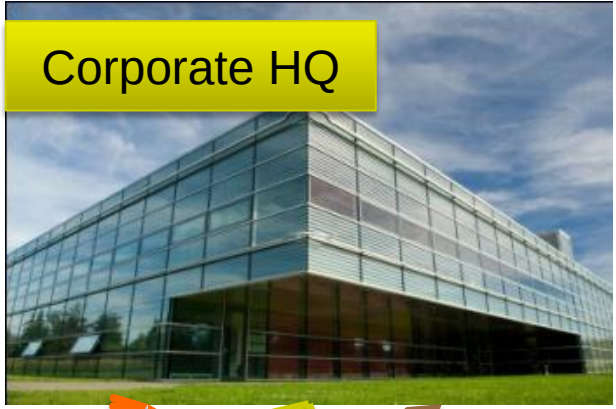
PI Data Access – Integrate your events with other systems



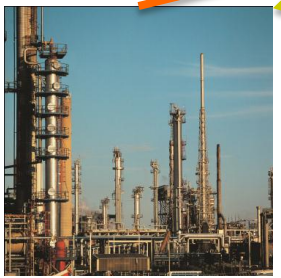
What's Coming Next…

PI AF to PI AF Scenarios

- Implement corporate standards
- Ensure commonality across enterprise
- Configuration changes, updates
- PI Event Frames and data to support analysis and KPIs

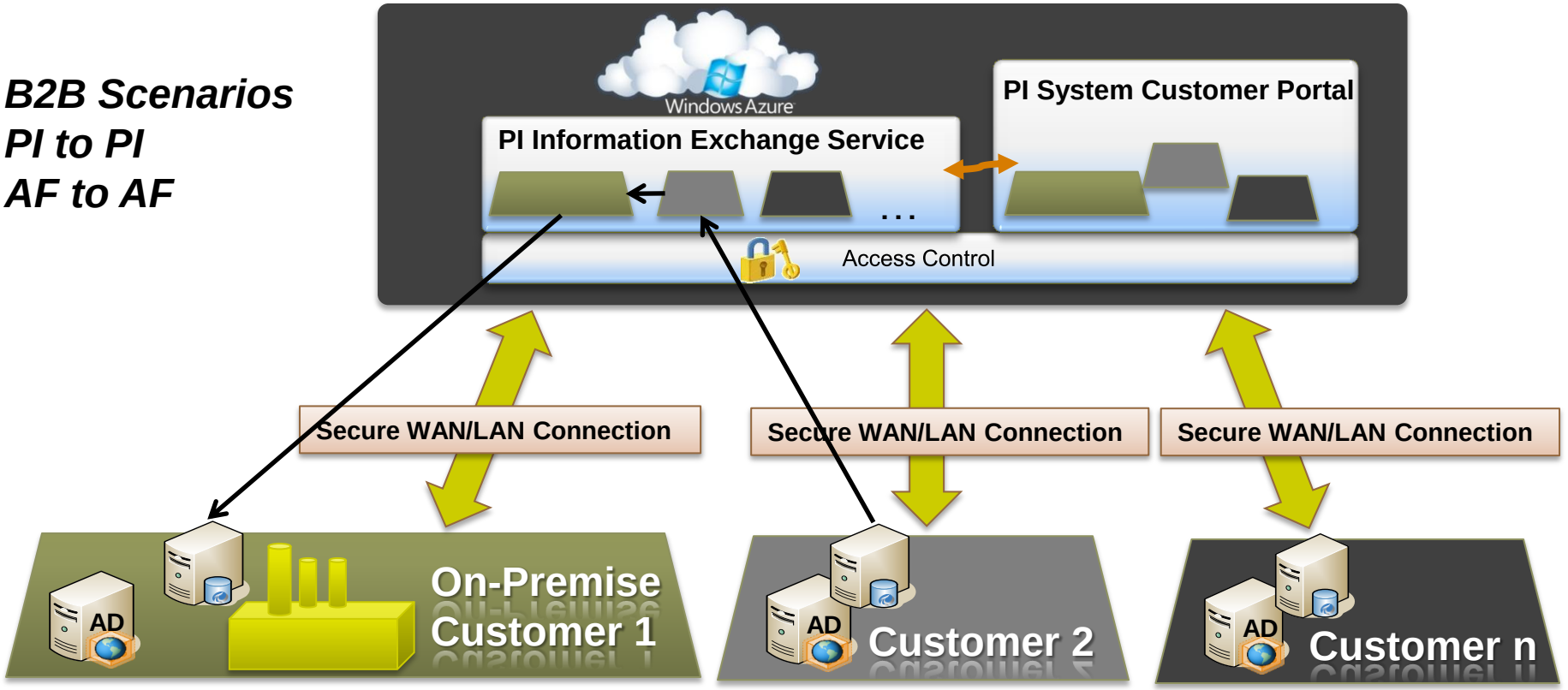


Templates



PI Information Exchange Services

B2B Scenarios
PI to PI
AF to AF



Project Abacus

Configured and Programmed Calculations for PI AF

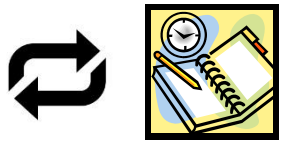
Project Abacus Use Case

Extruding Process

Boiler Efficiency = AVG(B1..Bn)

Boiler1

- Flow Out
- Fuel Flow Rate
- Efficiency = (Flow Out / Fuel Flow Rate * 3.14)



Boiler Template

Or myProgrammedCalc (Flow Out, Fuel Flow Rate)

Boiler2

- Flow Out
- Fuel Flow Rate
- Efficiency

Boiler3

- Flow Out
- Fuel Flow Rate
- Efficiency

EVENT FILTERS

Duration

Longer Than — Shorter Than

0 m — 200 m

Category

All | None

- ✓ Excursions (4)
- ✓ Downtime (3)
- ✓ Product XYZ (1)

Template

All | None

- ✓ Boiler Downtime (3)
- ✓ Boiler KPI Excursion (4)
- ✓ PIUnitBatch (1)

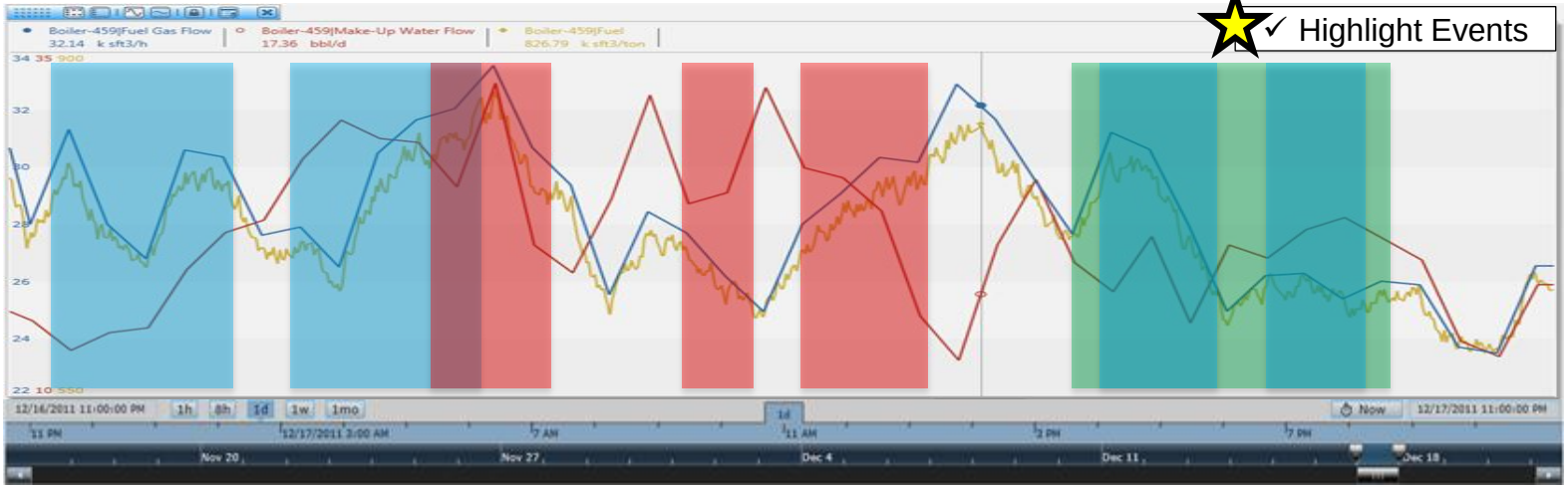
Temp.Max

Greater Than — Less Than

0 C — 100 C

Cart

Name	Start	End	Duration	Element	Category	Template	Reason Code	Temp.Max
Ex01	16-Dec-2011 23:05:48	17-Dec-2011 00:25:24	01:19:36	B-459	Excursions	Boiler KPI Excursion	High Temp	91.2
Ex02	17-Dec-2011 02:37:19	17-Dec-2011 04:12:07	01:34:48	B-459	Excursions	Boiler KPI Excursion	Low Pressure	54.1
DT45	17-Dec-2011 04:31:22	17-Dec-2011 05:20:34	00:49:12	B-459	Downtime	Boiler Downtime	Broken Thermo	32.4
DT46	17-Dec-2011 07:56:58	17-Dec-2011 08:19:46	00:22:48	B-459	Downtime	Boiler Downtime	Broken Thermo	31.7
DT47	17-Dec-2011 09:41:22	17-Dec-2011 10:52:58	01:11:36	B-459	Downtime	Boiler Downtime	Safety Shutdown	87.2
XYZ146	17-Dec-2011 13:12:34	17-Dec-2011 16:29:22	03:16:48	B-459	Product XYZ	PIUnitBatch	n/a	48.9
Ex03	17-Dec-2011 19:28:58	17-Dec-2011 20:41:22	01:12:24	B-459	Excursions	Boiler KPI Excursion	High Temp	95.3
Ex04	17-Dec-2011 21:44:58	17-Dec-2011 22:45:46	01:00:48	B-459	Excursions	Boiler KPI Excursion	Low Temp	20.4



Event Generation in Abacus

|Efficiency

|Fuel Flow Rate

|Flow Out

"Abacus"

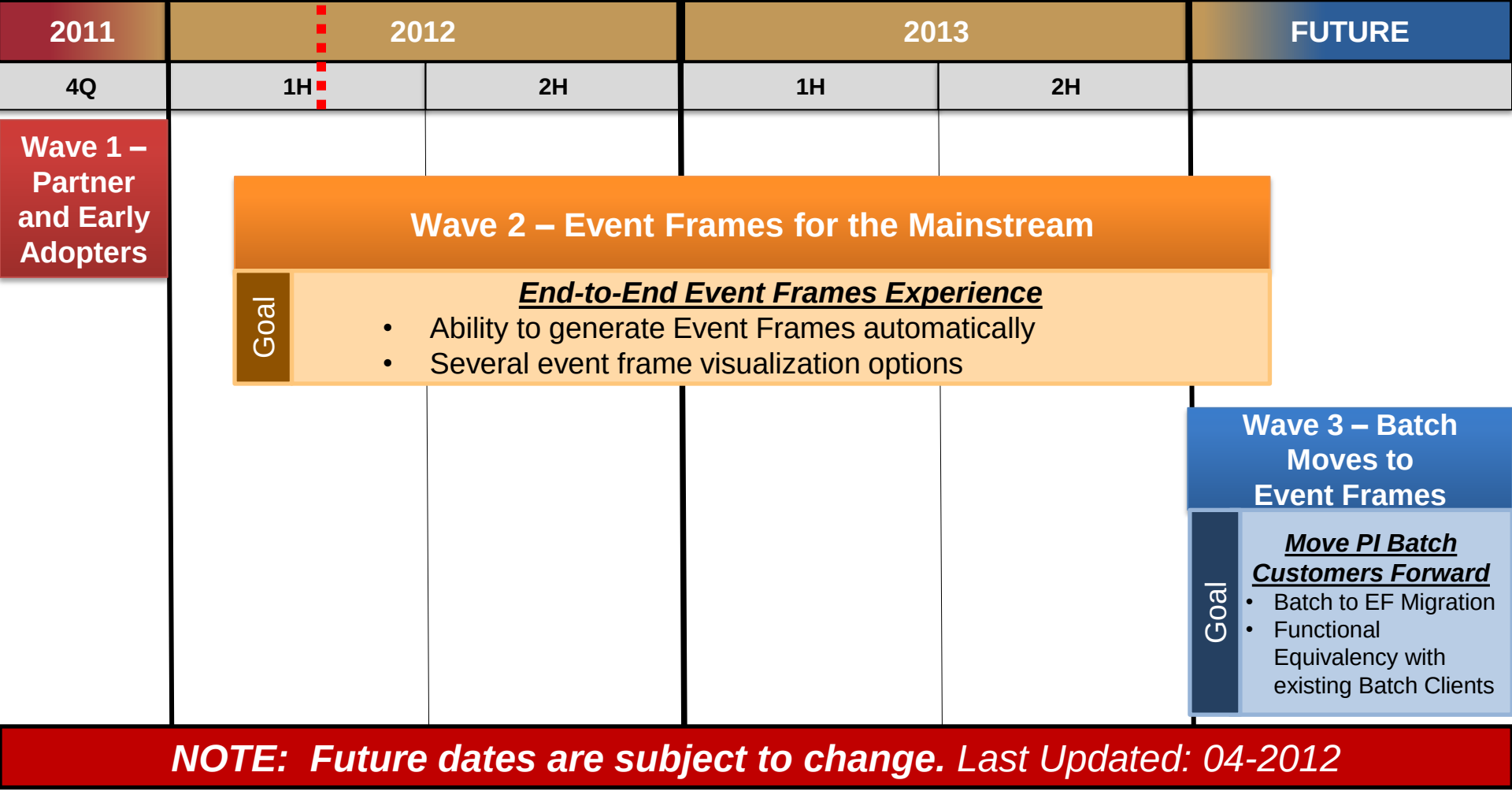
myEF

|Efficiency

Efficiency = (Flow Out / Fuel Flow Rate * 3.14)

myEF.Start = (Efficiency > LIMIT)

myEF.End = (Efficiency < LIMIT) AND (Fuel Flow Rate > 80)



Smart Interfaces

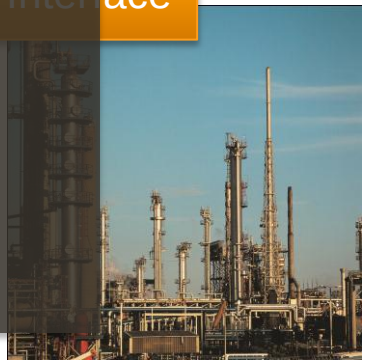
PI Interface

PI System

Tags
Assets
Data
Events

Automatically
discover your data,
send it to your PI System,
and keep it in sync.

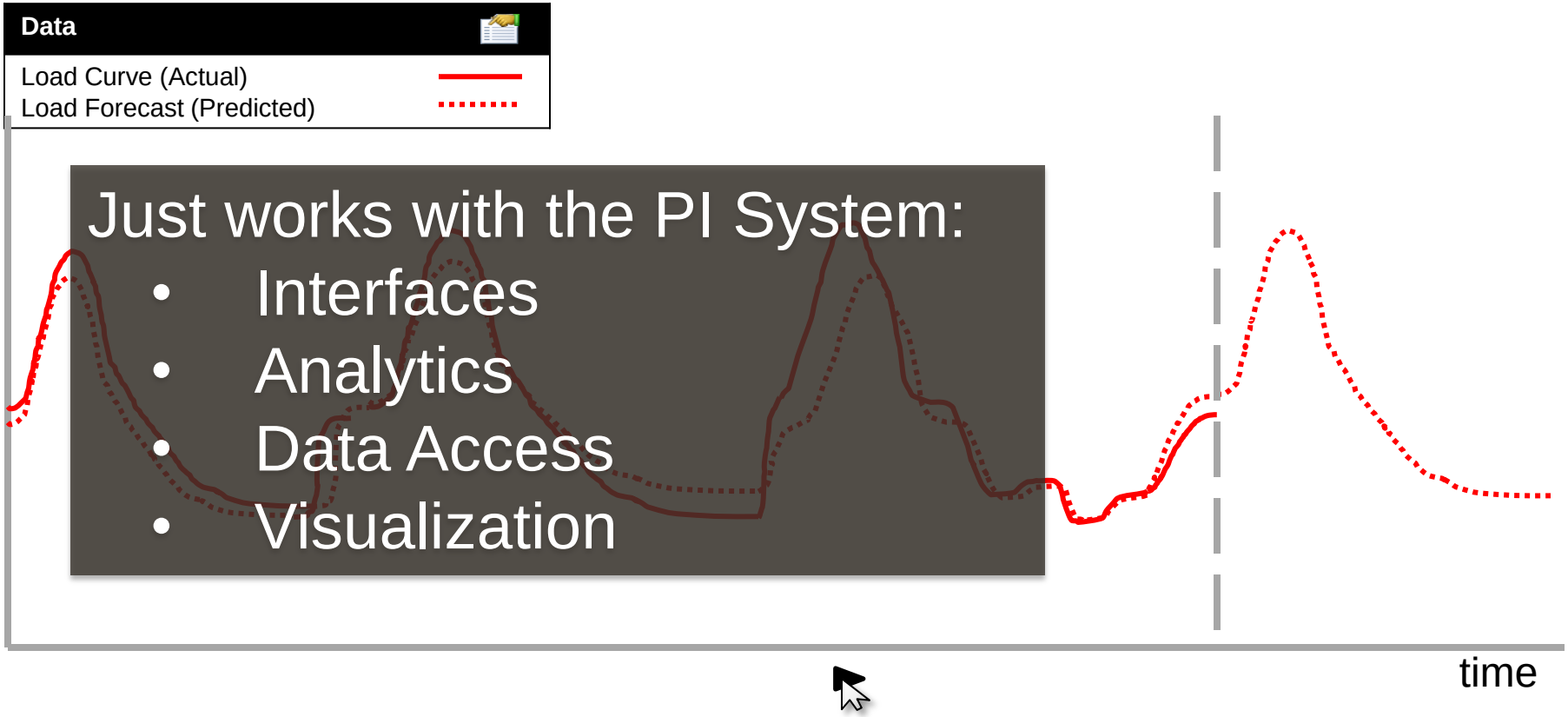
PI Interface



Find - PI System Search

- Optimized Search Engine for the whole PI System
  - And perhaps related systems
- Indexed for high performance
- Weighted / Ranked Results
  - Helps you find things more easily
- Can crawl many PI System machines
- Includes client artifacts
  - PI ProcessBook Displays, PI Coresight Displays
- Common User Experience

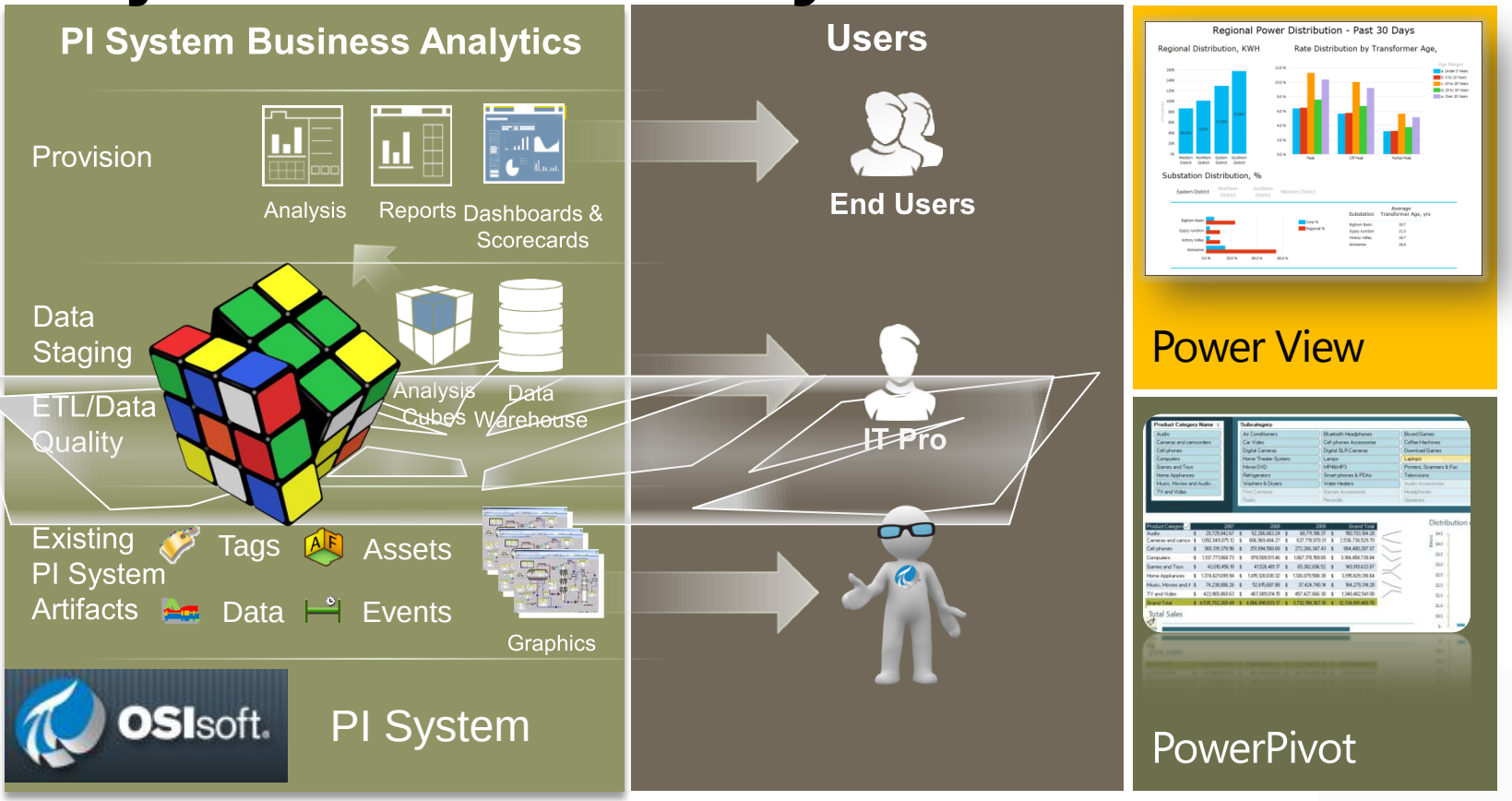
Future Data Coming – Next PI Server



PI Data Access, longer-term

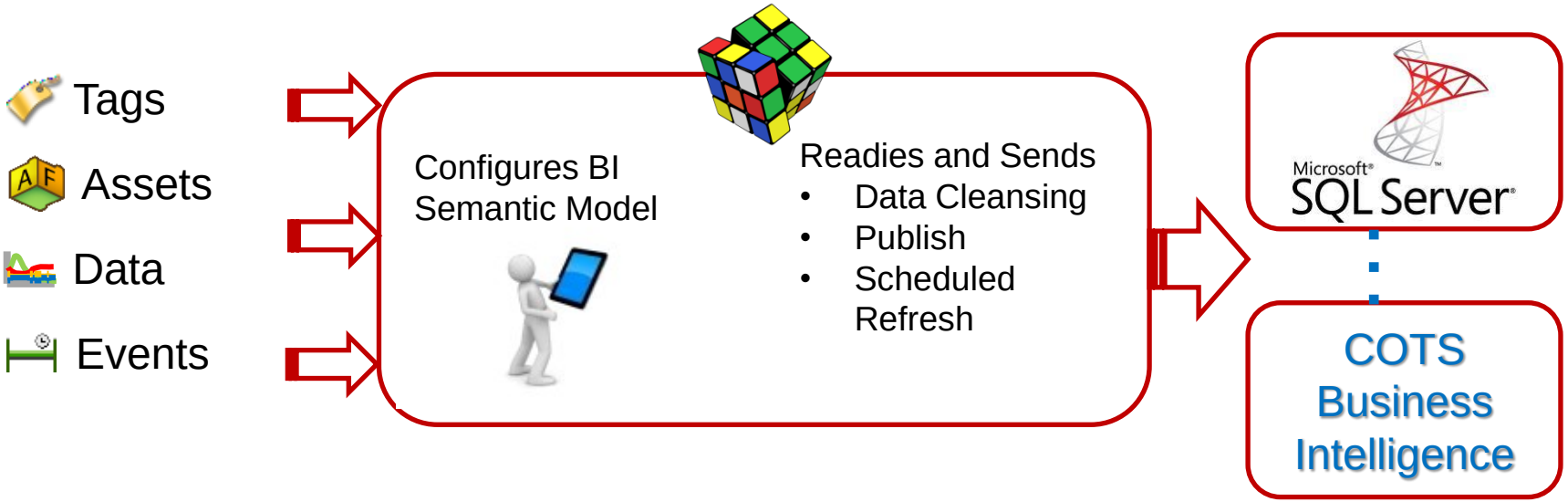
PI System SDK	A single high performance SDK that allows you to access all PI System data
RESTful Web Services	Emerging web service standard, ideally suited for mobile and cloud
Integration Services	Makes business system integration easy, not just possible (ERP, BI)

Project Rubik – Why?



Project Rubik

- Bridge the gap between PI System experts and BI Users
- Allow PI System expert to select the data
- Leverage BI Visualization Tools from Microsoft, SAP (and others)



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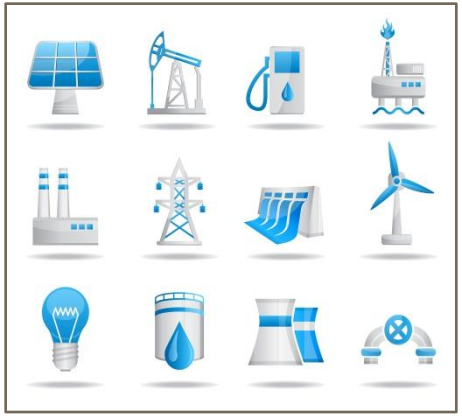

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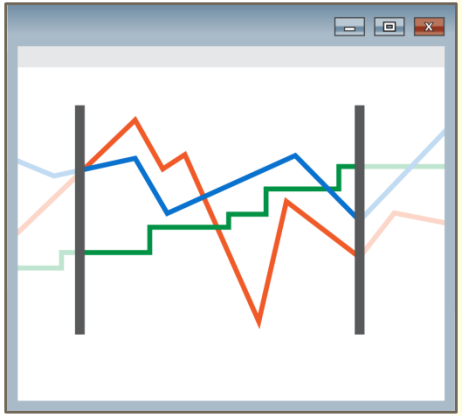

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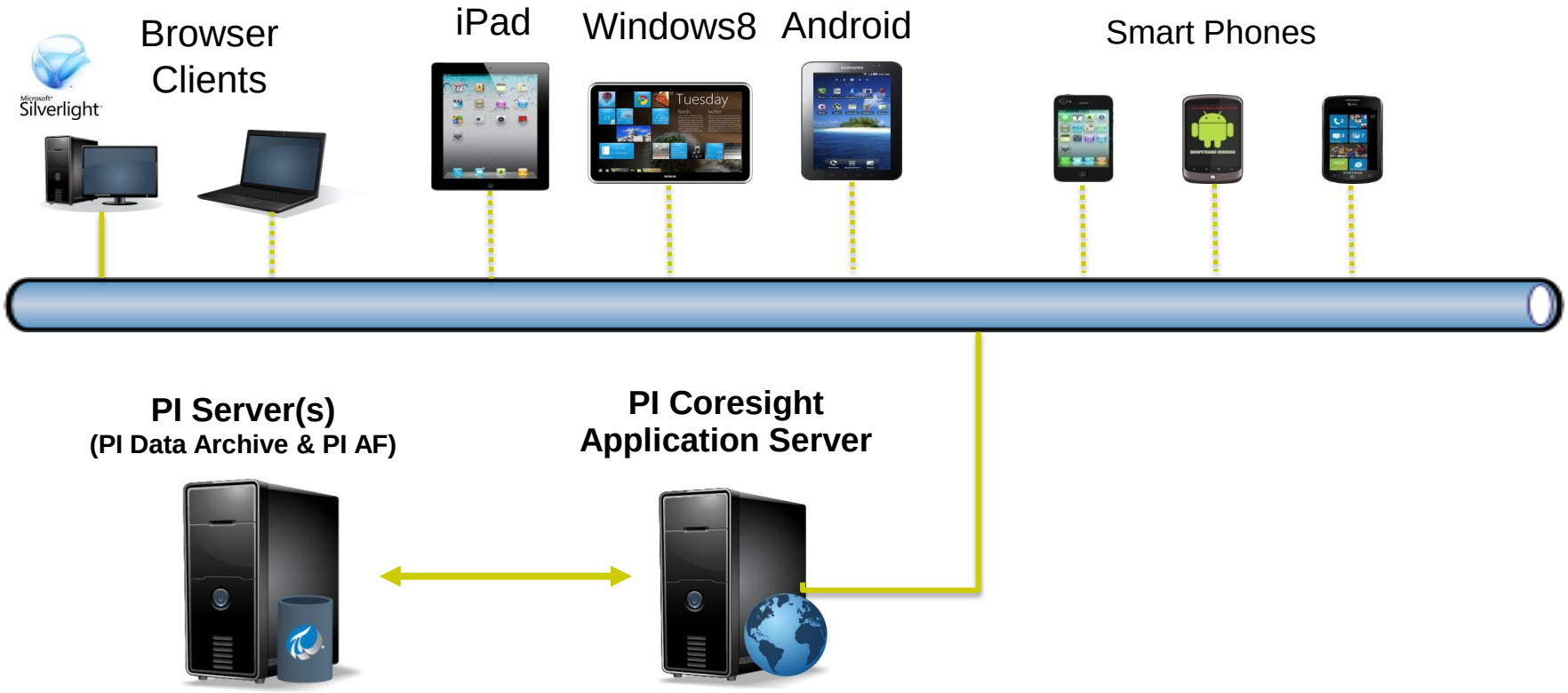
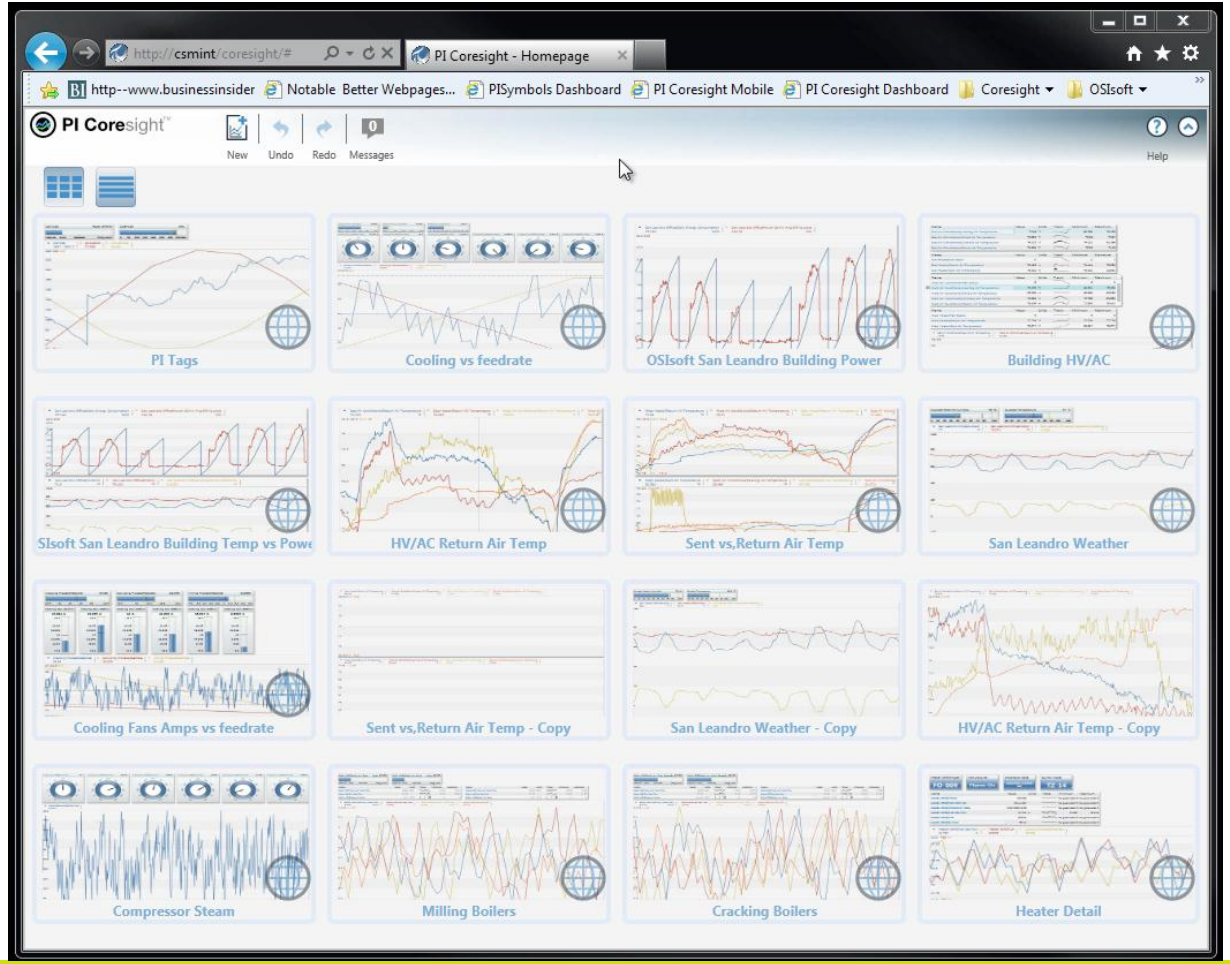
PI Coresight with Mobile Clients



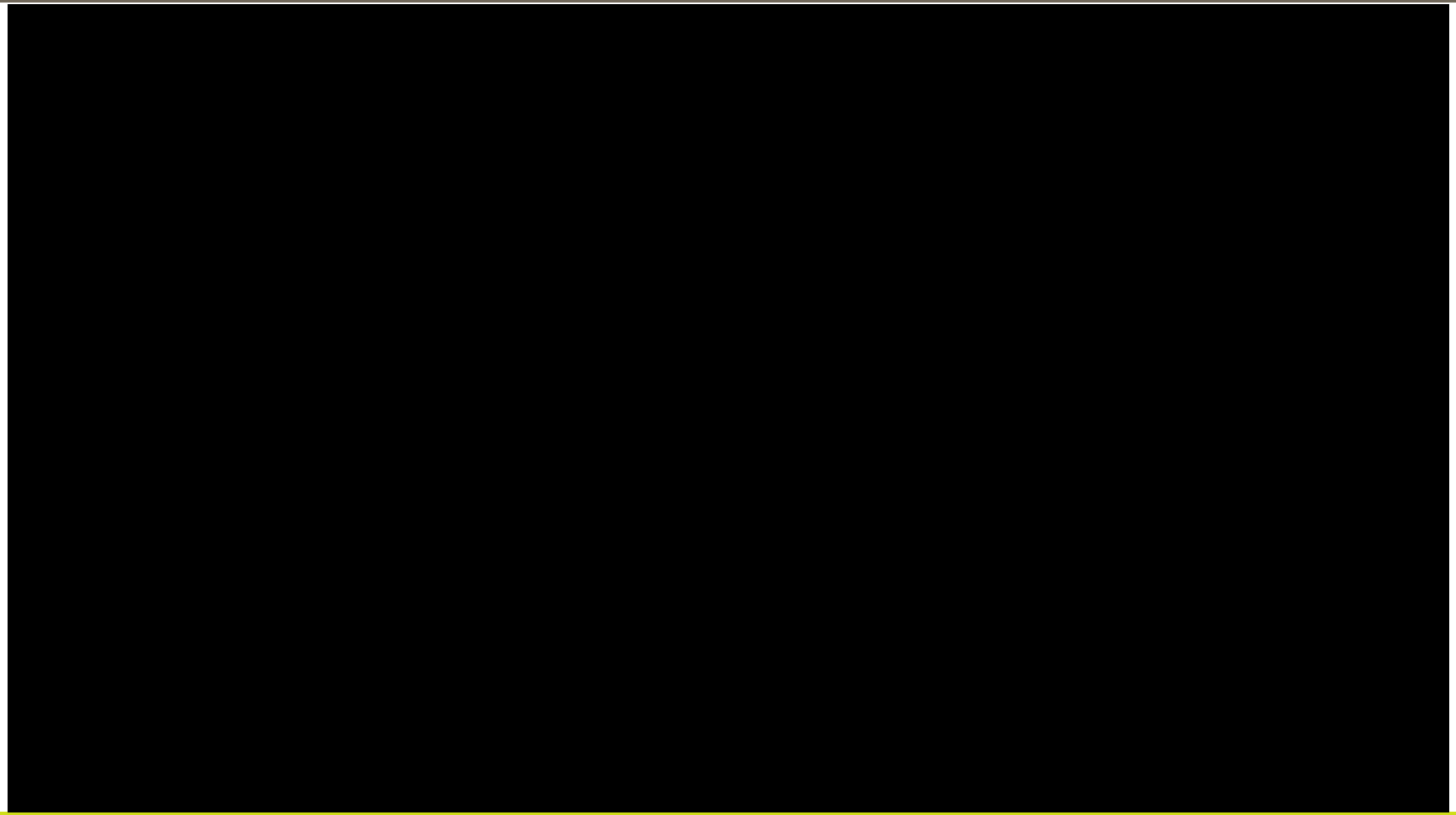
PI Coresight Tablet Edition – Target Audience

- Plant / Operations Management
  - Most likely to have iPad or similar device
  - Overview of how the plant/utility is running
  - Failures, Efficiency, KPIs, Actual vs Forecast
- Process Engineers / Corporate Planners
  - Identifying problems
  - Optimize processes – plant to plant
  - Create Content / Displays for management
- Maintenance
  - Manual Data Entry / Problem Recording
  - Troubleshooting – documents and real-time
  - Calibration

PI Coresight iPad Demo



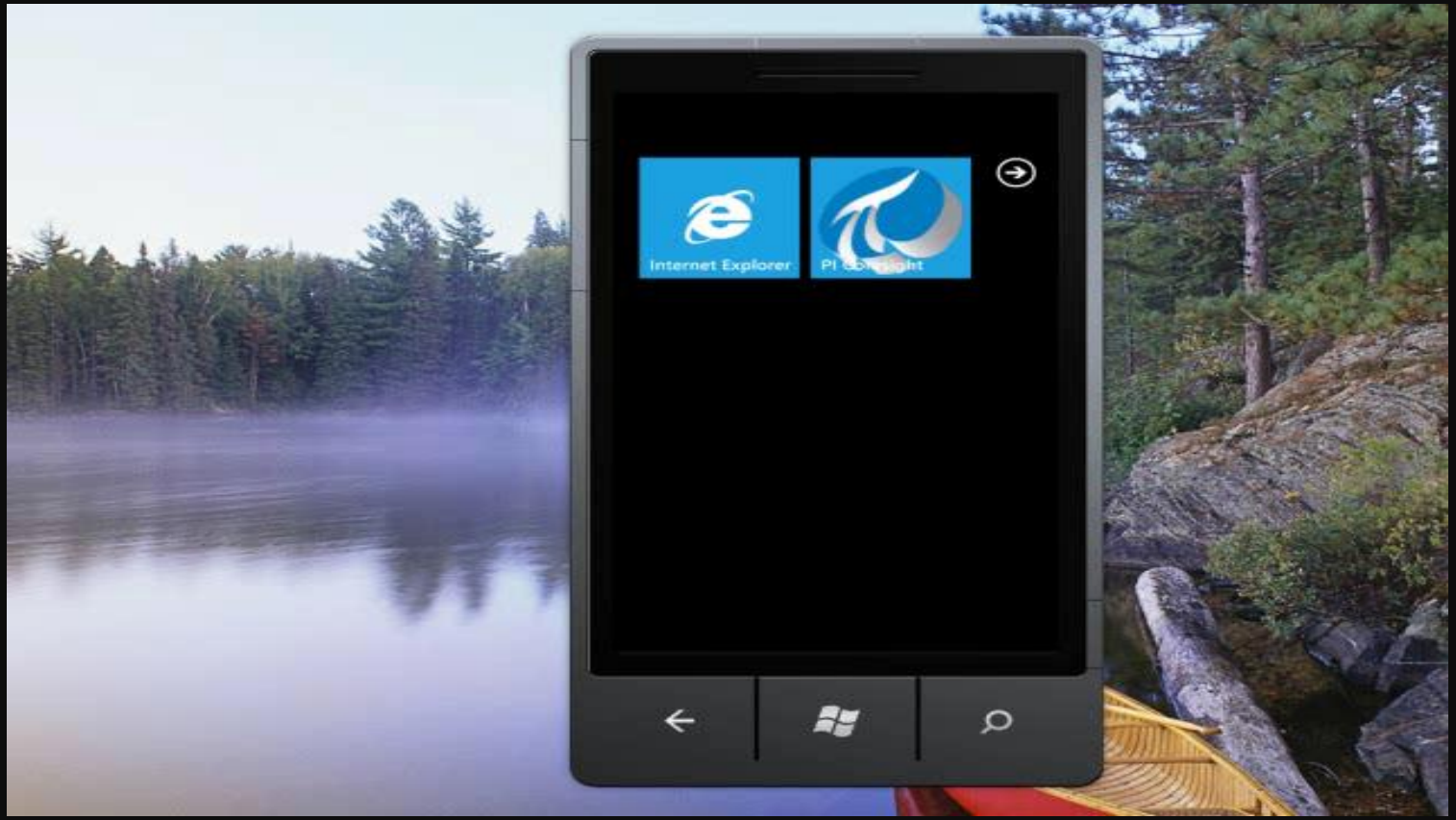
PI Coresight on Windows8 with PI Notifications



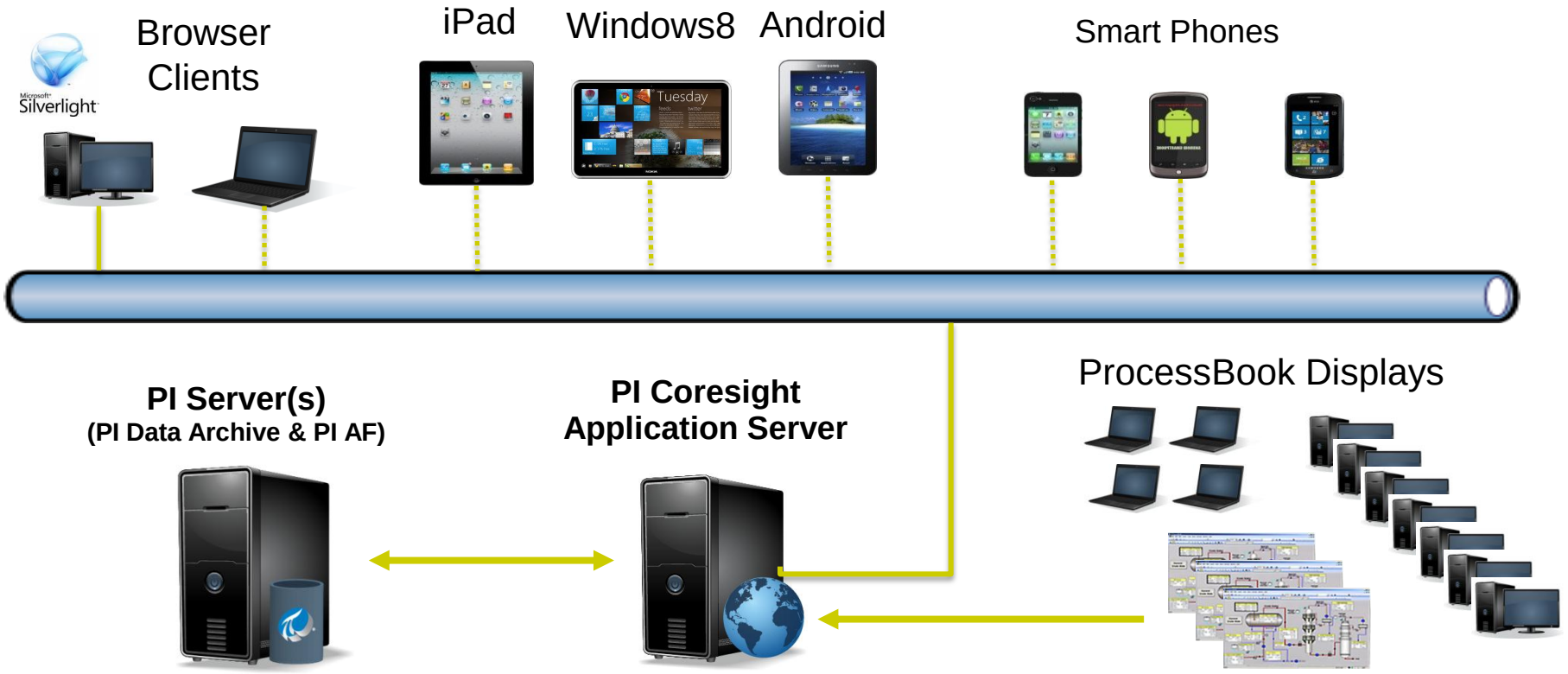
PI Coresight Phone Edition – Target Audience

- Check in with Plant from Home / Road
- Tell me if something is wrong!
- Focus on Notifications, Acknowledge, Dispatch, and Escalation
- Give me some basic data related to notification
- Outside of plant - 3G, 4G, or public WiFi
- Personalization

PI Coresight Phone Demo



PI Coresight – ProcessBook Display Viewer



PI WebParts 2013

- Support for SharePoint 2010 and SharePoint “15”
- Become a better SharePoint corporate citizen
- Become a more “IT” friendly product
- Replace obsolete technology
- Set the stage for OS and Browser independence, Mobile

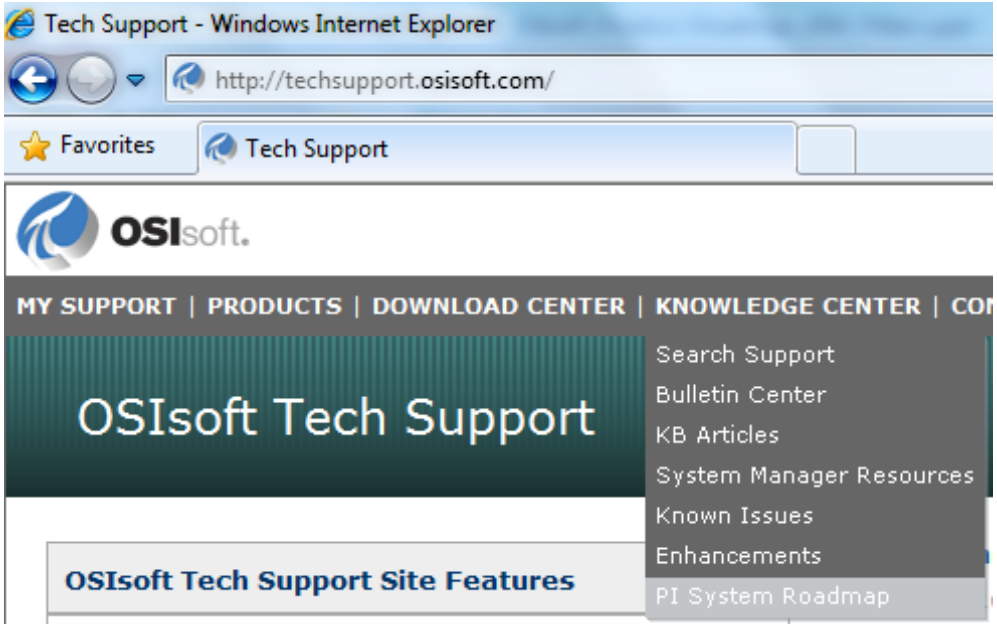
- Remote Data Services
- WSP Installs
- IE 8 with Adobe SVG Viewer if needed
- IE9 and IE10 with Master Page Mode change
- Firefox and Chrome

- Remote Data Services
- WSP Installs
- Visualization using Web Standards
- Support for IE9, IE10, Firefox, and Chrome
- Mobile Devices per Microsoft Support
  - iOS, Android, Windows Phone

Stay Up-To-Date on the Web

- PI System Roadmap on OSIsoft Technical Support Site

http://techsupport.osisoft.com/techsupport/NonTemplates/roadmap.aspx



THANK YOU

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