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REGIONAL SEMINAR 2012

E M E A

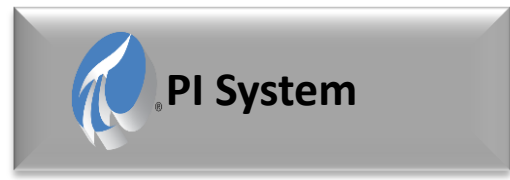
The Power of Data



Integrating PI with Enterprise Systems

Presented by

Production Maintenance Inventory Quality



Business Integration – Why?

Enable business agility (time enough to act)



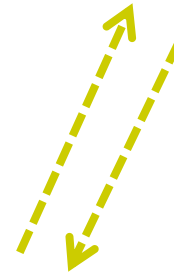
- Available-to-promise (ATP), better inventory, visibility into capacity
- Condition-based maintenance (CBM) for better asset reliability, reduce maintenance cost
- Quality – compare production runs, close out orders faster
- Visual – visibility into PI System data throughout the enterprise



Business Integration - What?



- Data/Event integration (transactions)
 - 1000s/day
 - small amounts of data (per transaction)



- Visual integration



- Business Intelligence + Reporting
(not covered in this talk)

Business Integration - How?

- PI Data Access family of products
- PI Notifications
- Assets Synchronization



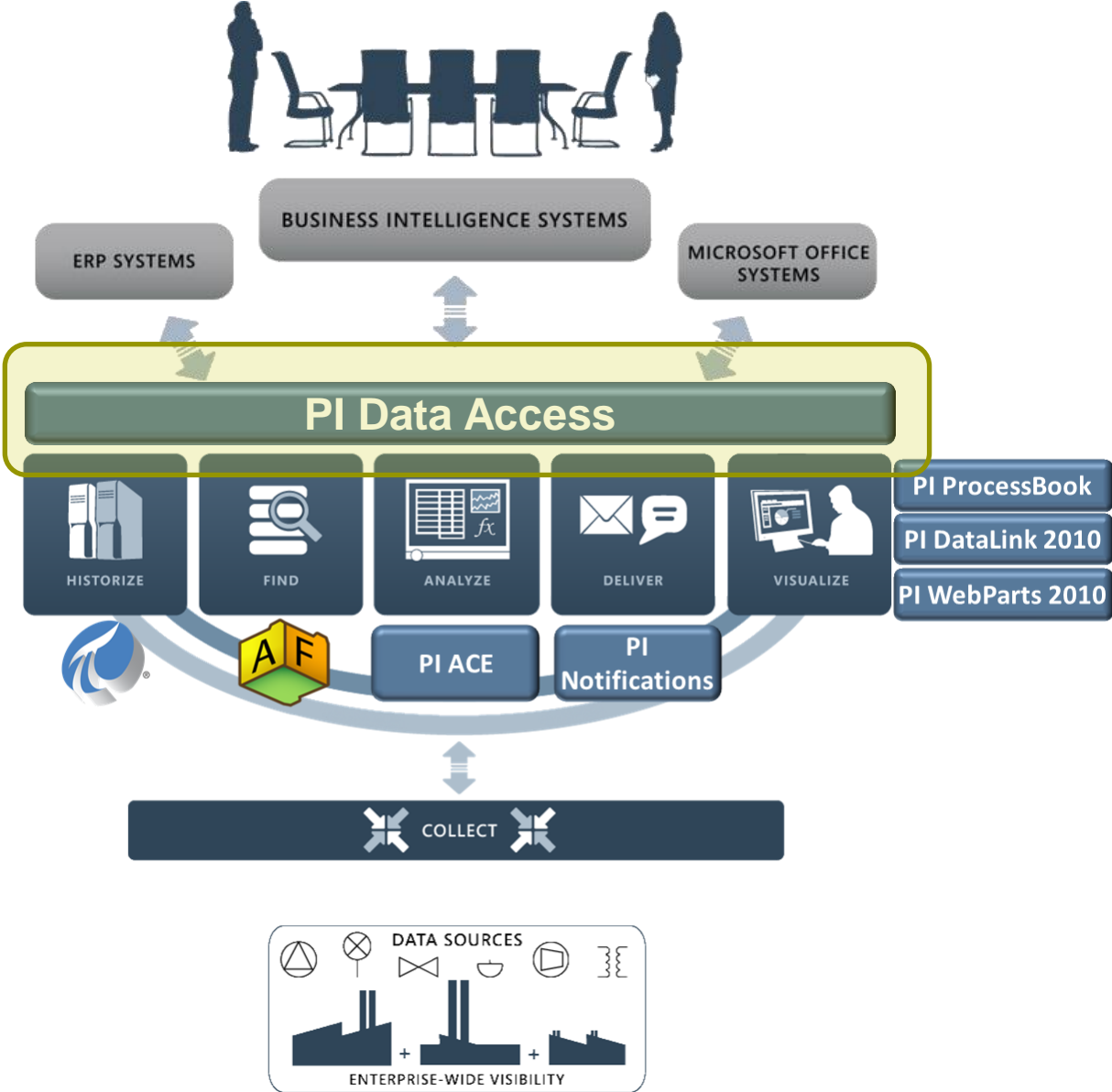
ORACLE

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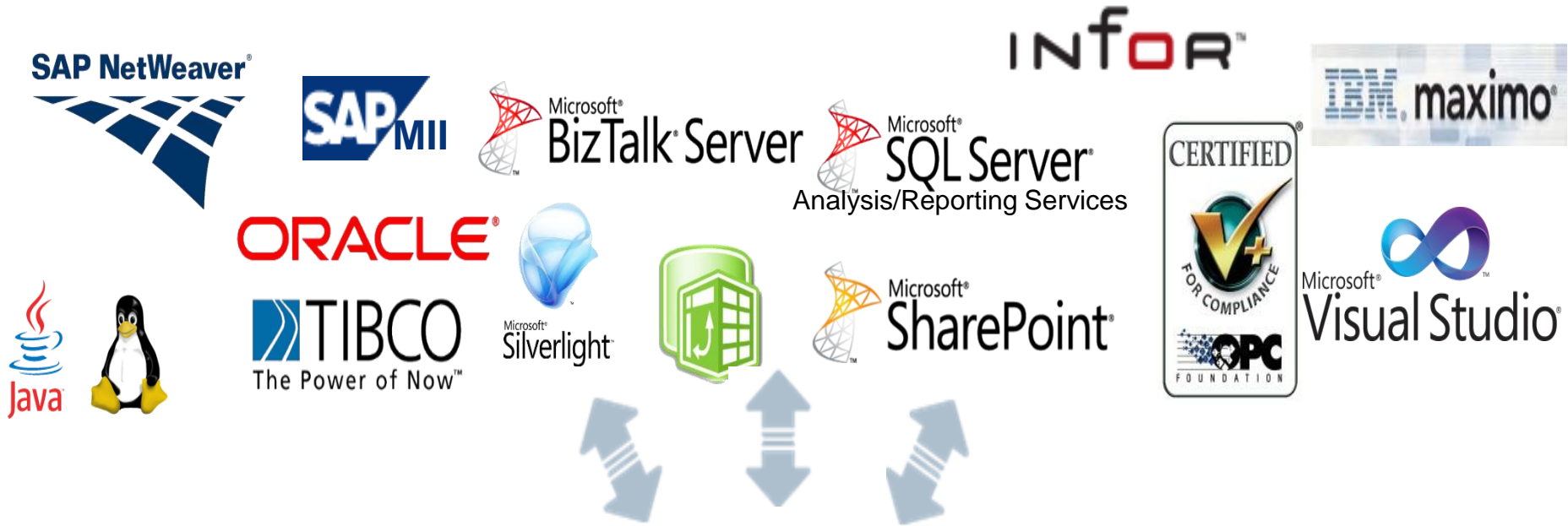


MINCOM

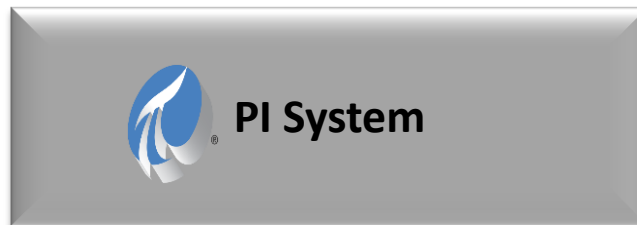
The PI System



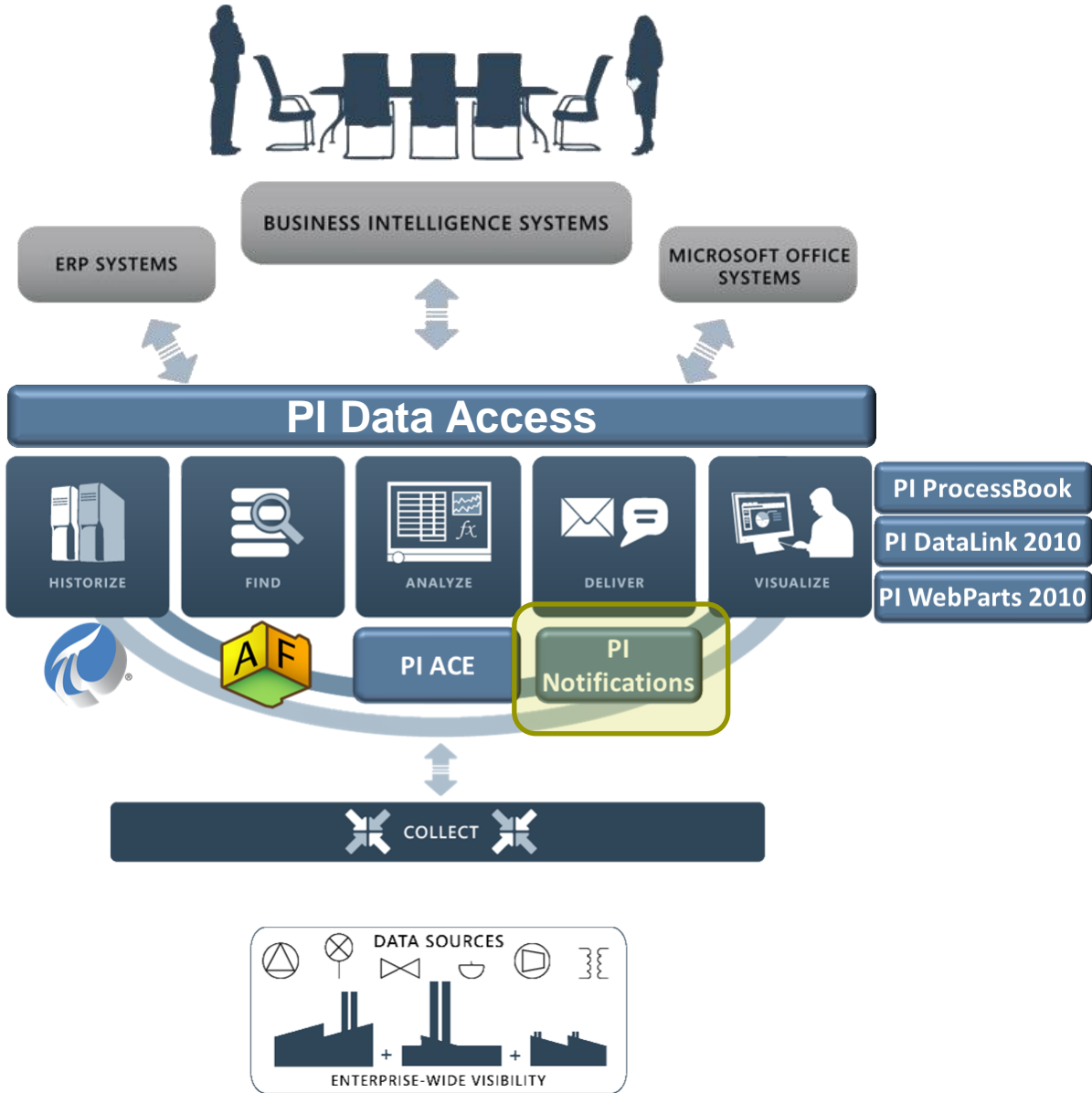
PI Data Access



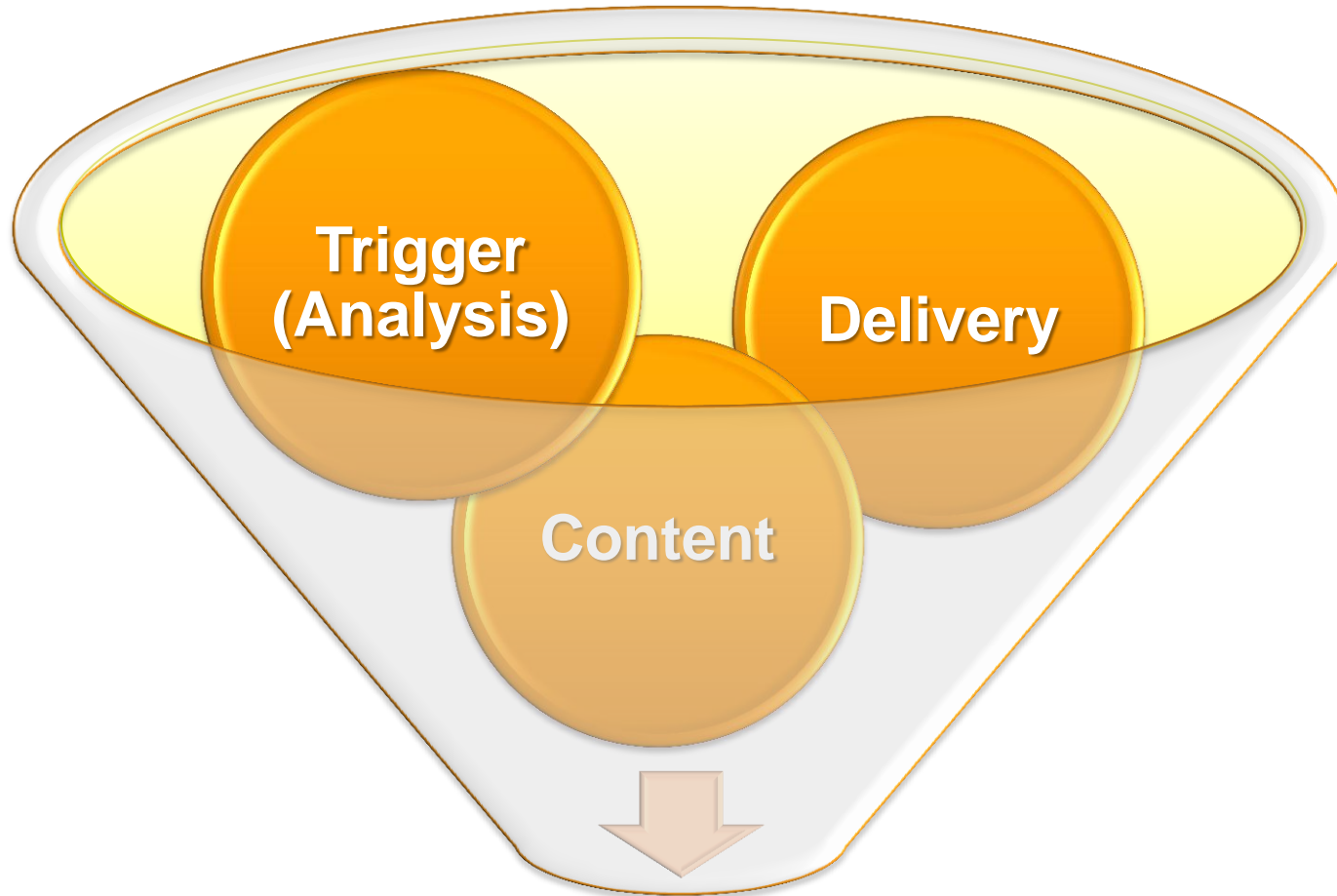
PI Data Access family of products



The PI System

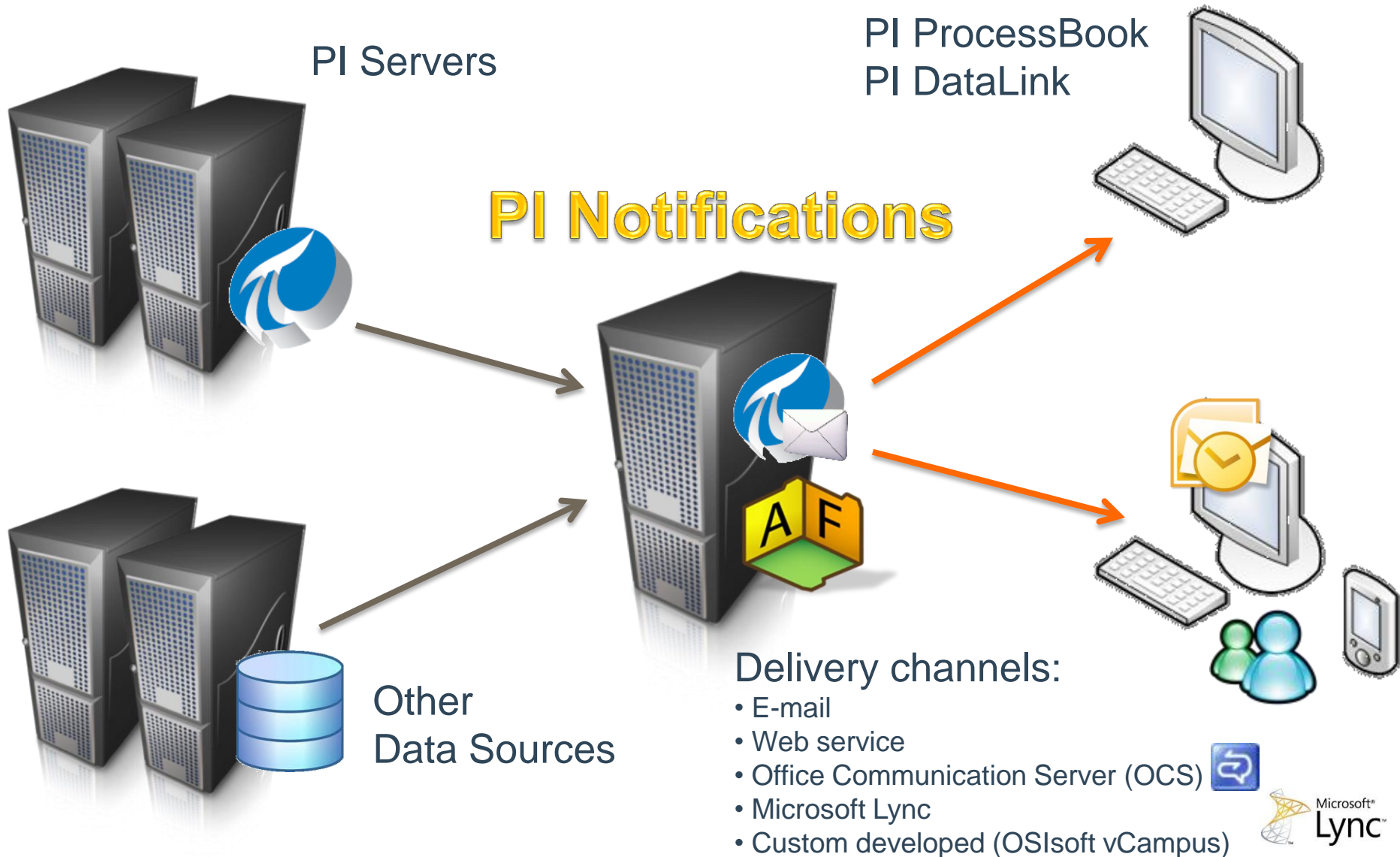


Base Concept of a PI Notifications

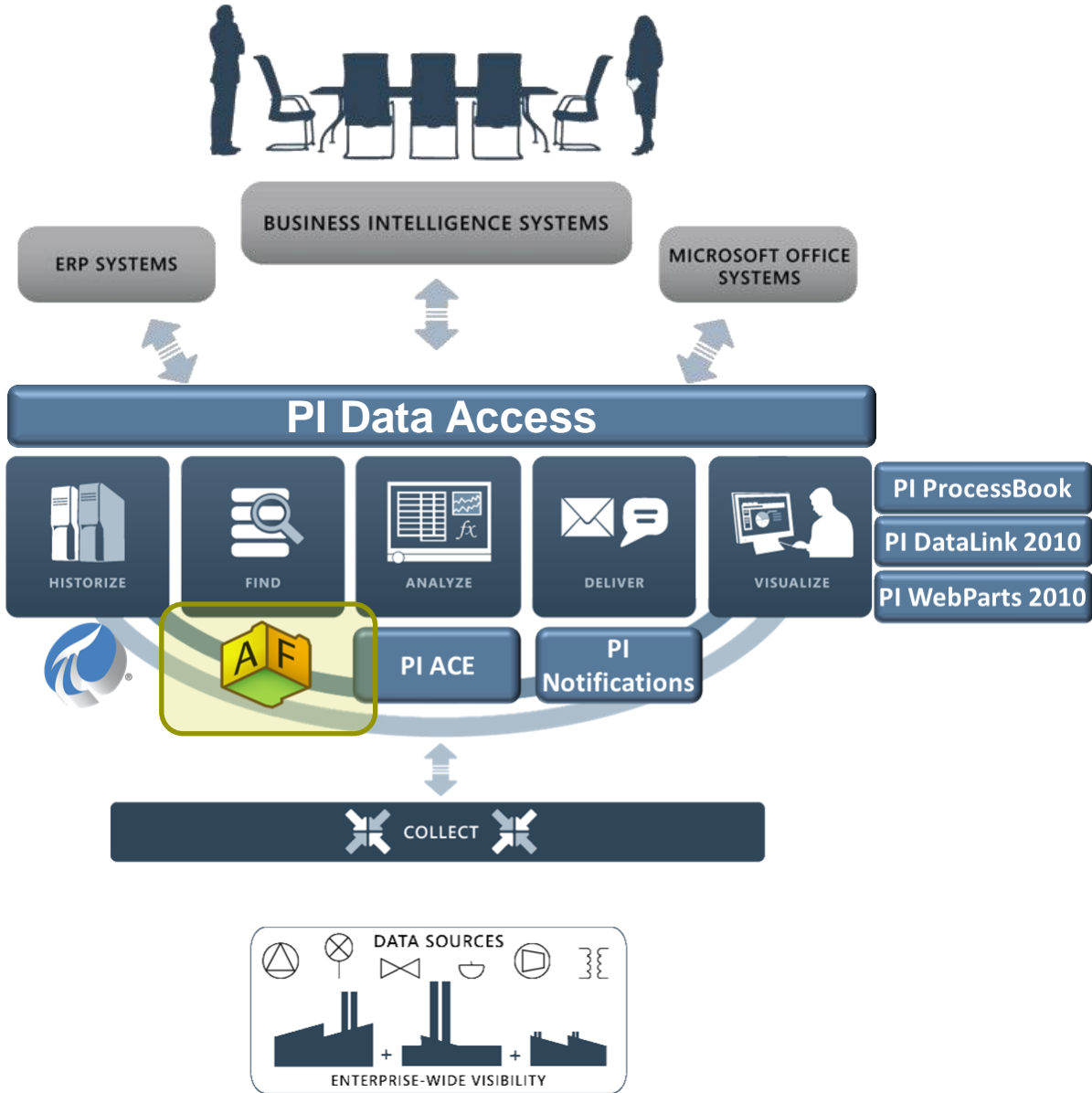


Notification

PI Notifications Architecture



The PI System



Business Integration – asset naming convention

The screenshot displays the IBM Maximo interface. On the left, a table lists assets with columns for 'Asset' and 'Description'. The main window, titled 'AF - PI System Explorer', shows a tree view of 'Elements' under 'Maximo_Eqpt_List'. The selected element is '11210 : Circulation Fan- Centrifugal/ 20/000 CFM'. The right pane shows the details for this element, including its name, description, template, and categories.

Asset	Description
11200	HVAC System- 50 T Heat Cap
11210	Circulation Fan- C
11211	Motor Starter- Size 2
11220	Electrical Control Pa
11230	Emergency Generat
11240	Circulation Fan- Cen
11250	Circulation Fan- Cen
11300	Reciprocating Comp CFM
11340	Motor Starter- Size 12/440v/3ph/60hz
11400	Boiler- 50,000 Lb/Hr Tube
11430	Centrifugal Pump 10
11450	Centrifugal Pump 10

AF - PI System Explorer

File Edit View Go Tools Help

Database Query Date Back Check In New Element Search

Elements

- Maximo_Eqpt_List
 - 11200 : HVAC System- 50 Ton Cool Cap/ 45
 - 11210 : Circulation Fan- Centrifugal/ 20/000 CFM**
 - 11211 : Motor Starter- Size 2/440v/3ph/60cy
 - 11220 : Electrical Control Panel- HVAC System
 - 11230 : Emergency Generator
 - 11240 : Circulation Fan- Centrifugal/ 20/000 CFM
 - 11250 : Circulation Fan- Centrifugal/ 20/000 CFM
 - 11300 : Reciprocating Compressor- Air Cooled
 - 11340 : Motor Starter- Size 4/NEMA 12/440v
 - 11400 : Boiler- 50,000 Lb/Hr/ Gas Fired/ Water Tube
 - 11430 : Centrifugal Pump 100GPM/60FT HD
 - 11450 : Centrifugal Pump 100GPM/60FT HD
 - 11470 : Centrifugal Pump 100 GPM, 60 FT-H
 - 11480 : Centrifugal Pump 100 GPM, 60 FT-H

11210 : Circulation Fan- Centrifugal/ 20/000 CFM

General Child Elements Attributes Ports Version

Name: 11210 : Circulation Fan- Centrifugal/ 20/000 CFM

Description:

Template: Maximo_Asset Type: None

Categories:

Default Attribute: assetnum

[Extended Properties](#)

Find: [Parents](#) [Models](#) [Layers](#) [Connections](#) [Analyses](#) [Notifications](#)

Business Integration – shared asset names

The image shows a screenshot of the Maximo software interface with a search for 'pump' in the Assets table. A yellow callout bubble points to the search input field, which contains the text 'pump'. Another yellow callout bubble points to the search results in the 'Elements of Interest' table, which lists several 'Centrifugal Pump' assets. To the right, a PI ProcessBook plot titled 'Plot-0' displays two data series: 'E. MotorWindingT' (green line) and 'E. HealthIndex' (cyan line). The plot shows a fluctuating green line and a constant cyan line at a value of 9. The y-axis ranges from 30 to 150. The x-axis is labeled '0'.

Search for "pump" in Maximo

Search for "pump" in PI ProcessBook

Asset	Description
11430	Centrifugal Pump
11450	Centrifugal Pump
11480	Centrifugal Pump
11470	Centrifugal Pump
12222	Centrifugal Pump

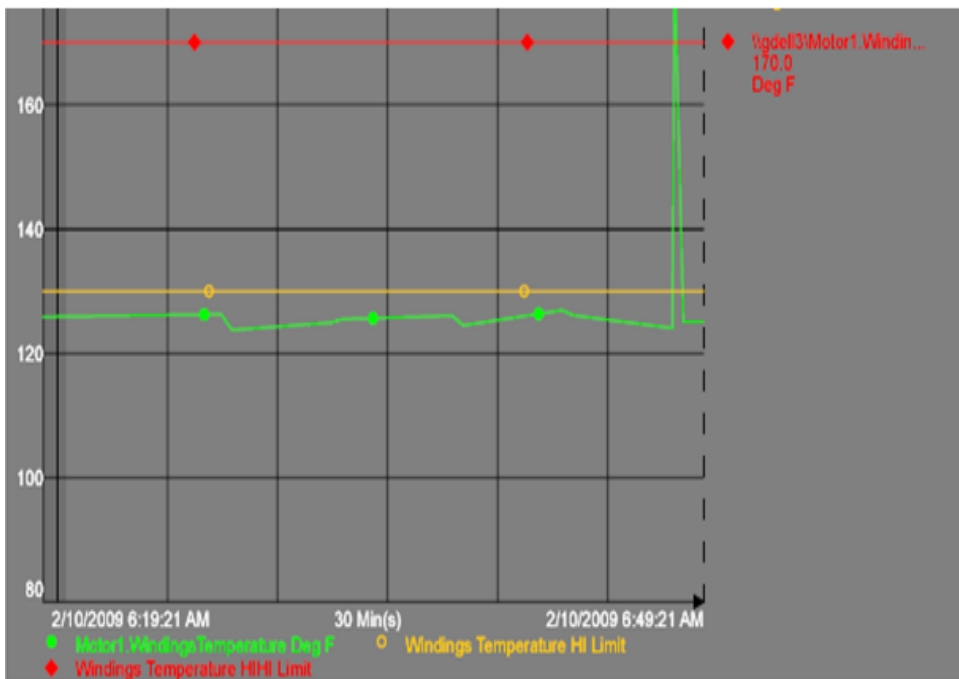
Name	Description
Maximo_Asset	
11430 : Centrifugal Pump 100GPM/60F...	
11450 : Centrifugal Pump 100GPM/60F...	
11470 : Centrifugal Pump 100 GPM, 60 ...	
11480 : Centrifugal Pump 100 GPM, 60 ...	

Plot-0

E. MotorWindingT
125.42
Deg F

E. HealthIndex
9

Business Integration – shared asset names



PI Coresight™ homepage

New Undo Redo Messages

Home ▶ DFPIAF ▶ PIML2 ▶ Maximo_Eqpt_List ▶

Search in Maximo_Eqpt_List

- 11220 : Electrical Control Panel- HVAC System
- 11230 : Emergency Generator
- 11240 : Circulation Fan- Centrifugal/ 20/000 CFM
- 11250 : Circulation Fan- Centrifugal/ 20/000 CFM
- 11300 : Reciprocating Compressor- Air Cooled/1
- 11340 : Motor Starter- Size 4/NEMA 12/440v/3p
- 11400 : Boiler- 50,000 Lb/Hr/ Gas Fired/ Water T
- 11430 : Centrifugal Pump 100GPM/60FT HD
- 11450 : Centrifugal Pump 100GPM/60FT HD1

Maximo Work Orders

Equipment	WoNum	PM	Description	Status	StatusDate	Location	ReportedBy	Re
11430	1668		HiTempAlert	COMP	12/8/2008 10:22:18 AM	BR430	WILSON	12/10/2008
11430	1666		HiTempAlert	COMP	11/21/2008 10:21:53 AM	BR430	WILSON	11/21/2008 10:21:53 AM
11430	T1573		Check pump operation.	WSCH	5/2/2008 1:33:34 PM	BR430	MAXADMIN	5/2/2008 1:33:22 PM
11430	T1574		Check pump float switch.	WSCH	5/2/2008 1:33:34 PM	BR430	MAXADMIN	5/2/2008 1:33:23 PM
11430	T1575		Check seal and housing for leaks.	WSCH	5/2/2008 1:33:33 PM	BR430	MAXADMIN	5/2/2008 1:33:23 PM

Maximo Work Orders for "pump" 11430 in PI Web Parts



Enterprise Integration Use Cases

- Maintenance
 - Usage-based maintenance (as opposed to calendar-based maintenance)
 - Condition-based maintenance
- Production
 - Real-time Inventory
 - Real-time Costing
- Implementation
 - Machine runhours (PI Totalizer Tag) is posted to CMMS
 - PI Alert posted to CMMS as a Work Request
 - Raw material consumption (PI Tag value) posted to SAP

PI Totalizer reading to Maximo

- PI Notifications (with XML Delivery Channel)
- Push data from PI
- Transaction Objects in AF for mapping
- No middleware required

MAXIMO_METER

General

Attribute Templates

Ports

Group by: Category

Search



	i Name	Description	Default Value
[-] MAX_METER_METERINFO_ToMaximo			
	<input checked="" type="checkbox"/> Assetnum	Required (optional if Location is specified)	
	<input checked="" type="checkbox"/> Location	Required (optional if Assetnum is specified)	
	<input checked="" type="checkbox"/> Metename	Required	
	<input checked="" type="checkbox"/> SiteID	Required, Maximo site, example BEDFORD	
[-] MAX_METER_READINGINFO_ToMaximo			
	<input checked="" type="checkbox"/> Inspector	Optional - Person who took the reading, take from PIPoint Annotation i...	
	<input checked="" type="checkbox"/> Reading	Required - PI Point with Reading Value and Timestamp to send to Ma...	



AF - PI System Explorer

File Edit View Go Tools Help

Database Query Date Back Check In New Element New Attribute Search

Elements

- MAXIMO_METER
 - 11430_O-PRESSUR
 - 11430_RUNHOURS
 - 11450_O-PRESSUR
 - 11450_RUNHOURS
 - 11470_O-PRESSUR
 - 11470_RUNHOURS
 - 11480_RUNHOURS
 - 12500_FUEL-G
 - 12500_RUNHOURS
 - A6001_ODOM-M

Elements

Event Frames

Library

Unit of Measure

MyPI

Notifications

Contacts

11430_RUNHOURS

General Child Elements **Attributes** Ports Version

Group by: Category

Search

	Name	Value	Description	Settings
MAX_METER_METERINFO_ToMaximo				
<input checked="" type="checkbox"/>	Assetnum	11430	Required (optional if Location is specified)	
<input checked="" type="checkbox"/>	Location	BR430	Required (optional if Assetnum is specified)	
<input checked="" type="checkbox"/>	Metename	RUNHOURS	Required	
<input checked="" type="checkbox"/>	SiteID	BEDFORD	Maximo site, example BEDFORD	
MAX_METER_READINGINFO_ToMaximo				
<input checked="" type="checkbox"/>	Inspector		Optional - Person who took the reading, take from PIPoin...	
<input checked="" type="checkbox"/>	Reading	12.55867	Required - PI Point with Reading Value and Timestamp t...	\\gdell6...

Reading

AF - PI System Explorer

File Edit View Go Tools Help

Database Query Date Back Check In New Template Search

Library

- AF
 - Categories
 - Templates
 - Element Templates
 - Event Frame Templates
 - Model Templates
 - Notification Templates
 - HiMotorWindingT
 - HiVibration
 - Runhours
 - Transfer Templates
 - Enumeration Sets
 - Reference Types
 - Tables

Elements

Event Frames

Library

Unit of Measure

MyPI

Notifications

Contacts

Runhours

Overview Trigger Content Subscriptions

Add

Standard Content

- Name
- Description
- Target
- Start Time
- End Time
- Trigger Time
- State
- Escalation Level
- Priority

Attribute Value

- \\GDELL610\AF\Element Templates[MAXIMO_METER]\Assetnum
- \\GDELL610\AF\Element Templates[MAXIMO_METER]\Inspector
- \\GDELL610\AF\Element Templates[MAXIMO_METER]\Location
- \\GDELL610\AF\Element Templates[MAXIMO_METER]\Metename
- \\GDELL610\AF\Element Templates[MAXIMO_METER]\Reading
- \\GDELL610\AF\Element Templates[MAXIMO_METER]\SiteID

Link

- Instant RtWebParts Trend

Runhours Modified: 1/29/2010 10:09:17 AM.

```
MaximoMeter.XML - Notepad
File Edit Format View Help
<Notification>
<NotificationName>Runhours1</NotificationName>
<NotificationDescription />
<NotificationState>Runhours</NotificationState>
<StartTime>1/29/2010 7:08:00 PM</StartTime>
<EndTime>1/1/1970 12:00:00AM</EndTime>
<\\GDELL610\AF\MAXIMO_METER\11430_RUNHOURS|Assetnum>11430</\\GDELL610\AF\MAXIMO_METER\11430_RUNHOURS|Assetnum>
<\\GDELL610\AF\MAXIMO_METER\11430_RUNHOURS|Inspector />
<\\GDELL610\AF\MAXIMO_METER\11430_RUNHOURS|Location>BR430</\\GDELL610\AF\MAXIMO_METER\11430_RUNHOURS|Location>
<\\GDELL610\AF\MAXIMO_METER\11430_RUNHOURS|Metername>RUNHOURS</\\GDELL610\AF\MAXIMO_METER\11430_RUNHOURS|Metername>
<\\GDELL610\AF\MAXIMO_METER\11430_RUNHOURS|Reading>88.325872</\\GDELL610\AF\MAXIMO_METER\11430_RUNHOURS|Reading>
<\\GDELL610\AF\MAXIMO_METER\11430_RUNHOURS|SiteID>BEDFORD</\\GDELL610\AF\MAXIMO_METER\11430_RUNHOURS|SiteID>
</Notification>
```

```
MaximoMeterInterface.xml - Notepad
File Edit Format View Help
<?xml version="1.0" encoding="utf-8"?>
<METERInterface xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://www.mro.com/mx/integration">
  <Header operation="Notify">
    <SenderID>EXTSYS1</SenderID>
  </Header>
  <Content>
    <METERDATA>
      <METERDATA>
        <ORGID>EAGLENA</ORGID>
        <SITEID>BEDFORD</SITEID>
        <ASSETNUM>11430</ASSETNUM>
        <METERNAME>RUNHOURS</METERNAME>
        <NEWREADING>11</NEWREADING>
        <NEWREADINGDATE>2010-01-22T19:11:00-05:00</NEWREADINGDATE>
      </METERDATA>
    </METERDATA>
  </Content>
</METERInterface>
```

Database Query Date Back Check In New Template Search

Library

- AF
 - Categories
 - Templates
 - Element Templates
 - Event Frame Templates
 - Model Templates
 - Notification Templates
 - HiMotorWinding T
 - HiVibration
 - Runhours
 - Transfer Templates

Runhours

Overview Trigger Content Subscriptions

Target: MAXIMO_METER Select A Target...

Conditions

New Condition ✕ ✎ ⬆ ⬇

Rule	Configuration	Time T...	Result ...	Priority
PerformanceEquation	True	0	Runhours	Normal

Time Rule: Periodic ⌵ ⋮

Runhours Modified:

Periodic Time Rule Configuration

Interval

Periodic
 Daily
 Monthly

Begin at: 23:00:00 on

Monday
 Friday
 Tuesday
 Saturday
 Wednesday
 Sunday
 Thursday

OK Cancel

Enterprise Integration Use Cases

- **Maintenance**

- Usage-based maintenance (as opposed to calendar-based maintenance)
- **Condition-based maintenance**

- **Production**

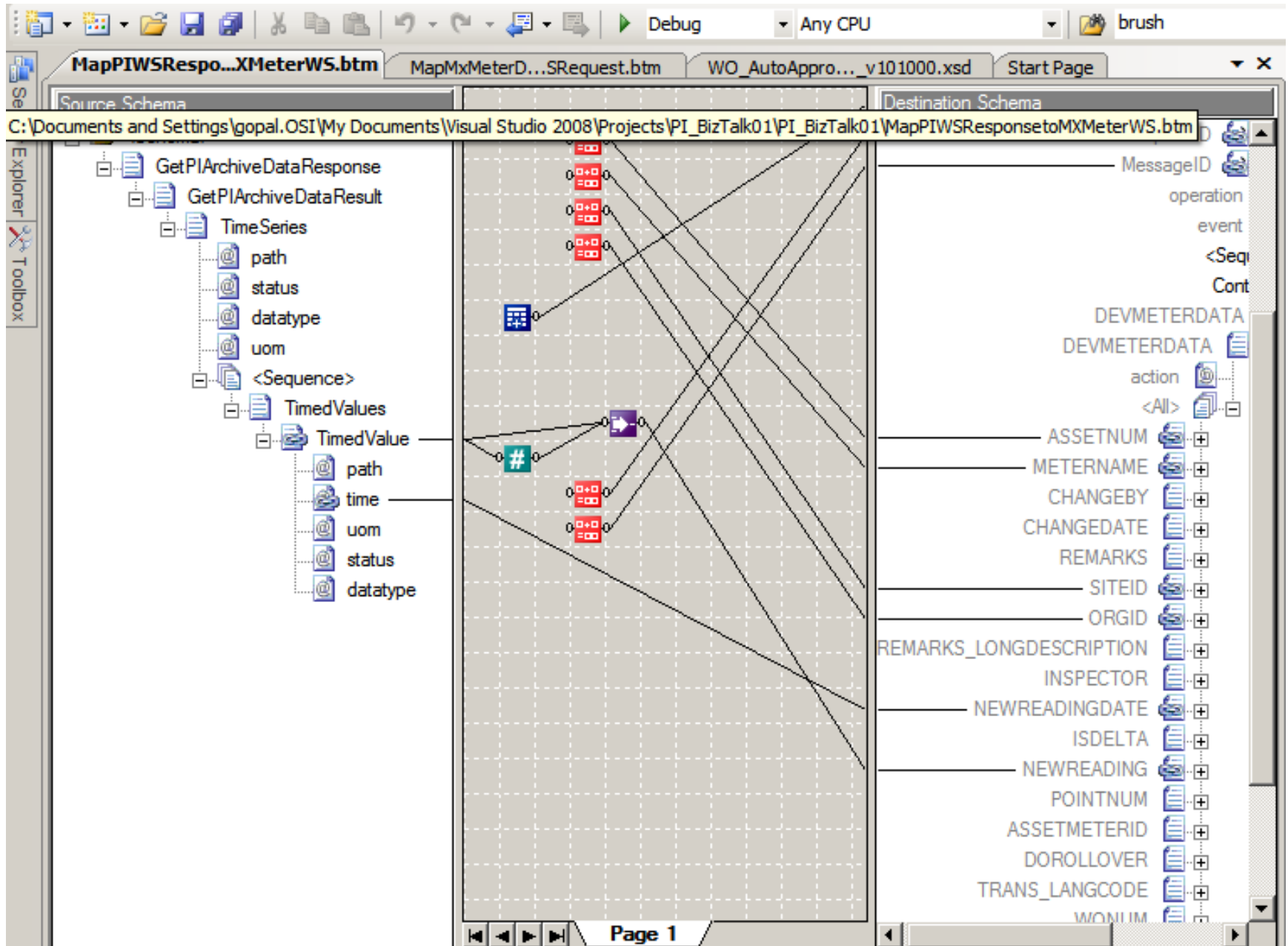
- Real-time Inventory
- Real-time Costing

- **Implementation**

- Machine runhours (PI Totalizer Tag) is posted to CMMS
- **PI Alert posted to CMMS as a Work Request**
- Raw material consumption (PI Tag value) posted to SAP

Bearing temperature high alert to Maximo Work Request

- Condition assessment using PI
- PI Web Services
- Middleware: Microsoft BizTalk



Enterprise Integration Use Cases

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- **Implementation**
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THANK YOU

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