OSIsoft.

USERS CONFERENCE 2012

The Power of Data

Business agility through PI System integration with SAP, Maximo and other business systems

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Brian McMorrow

This talk is in 2 parts

Line of Business(LoB) Integration

- What, Why, How…
- Using PI Event Frames for “transactions” in LoB integration

Using the PI System with

- SAP HANA
- SAP BusinessObjects

Q & A

Compliance Reporting Lab Calibration

Production Maintenance Inventory Quality

ISO

PI System

CA.GOV

SAP

IBM

ORACLE

INFOR

IFS

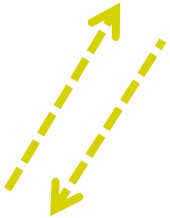
MINCOM

Ventyx

ERP and Asset Management System

Business Integration - What?

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



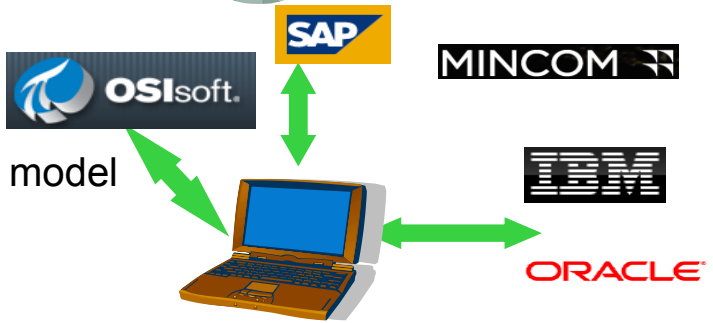
- Visual integration

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

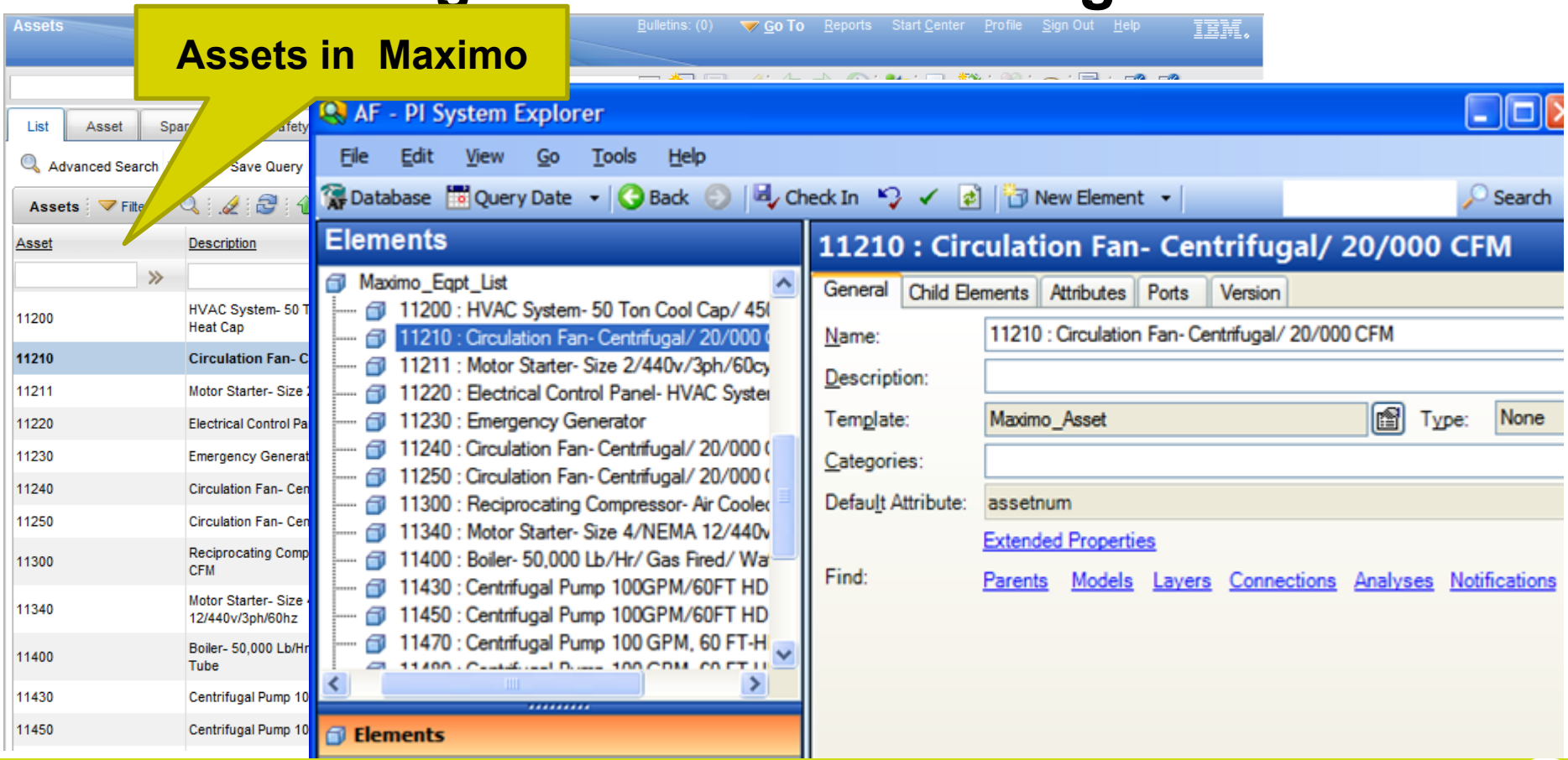
Business Integration – What (Data, Event, Visual)

- Data - motor run-hours (once a day)
- Event - motor vibration (on alert)
- Event - raw material consumed, goods produced
- Data - lab data (pH, density…) for a batch

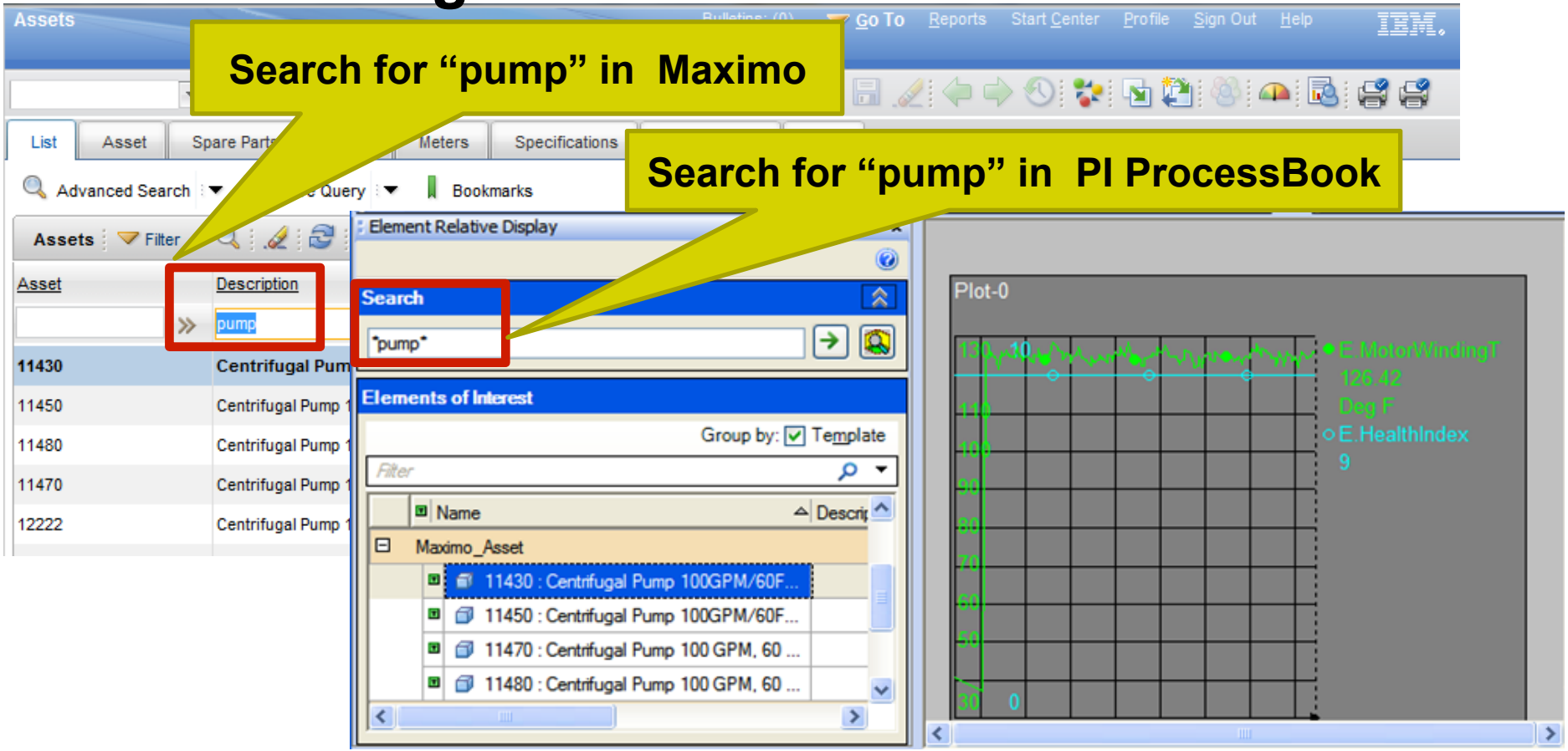
- Visual integration
  - shared asset naming convention or data model
  - Loosely coupled URLs



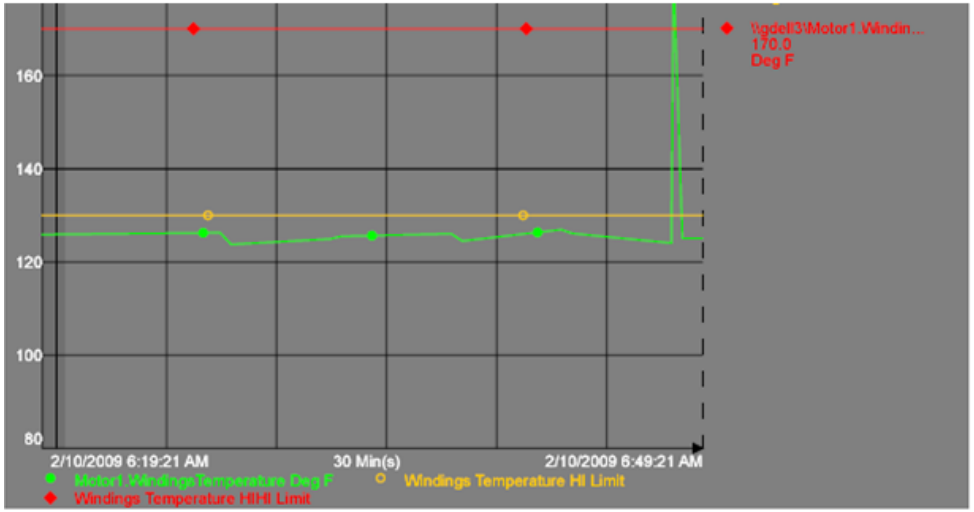
Business Integration – asset naming convention

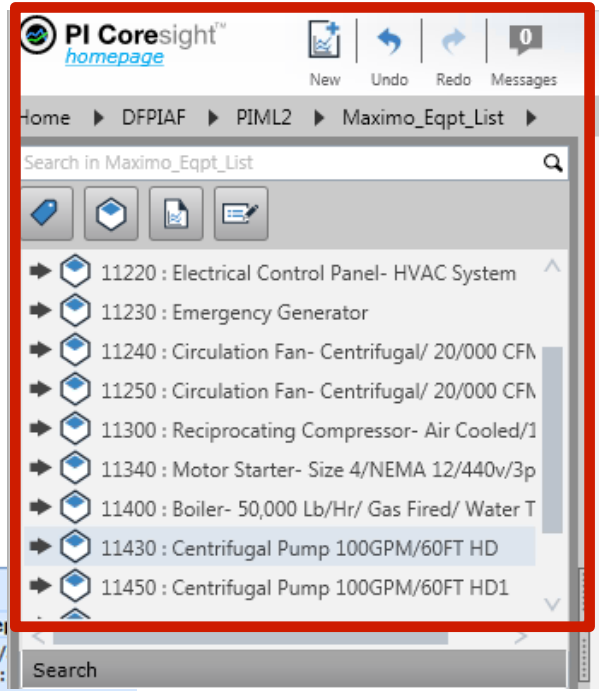


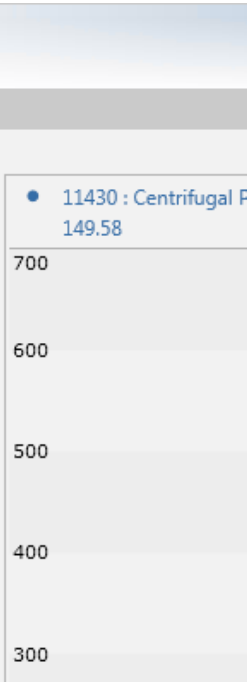
Business Integration – shared asset names



Business Integration – shared asset names







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:
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 SharePoint using PI Web Parts

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

Compliance Reporting Lab Calibration

Production Maintenance Inventory Quality

SAP

IBM

XML

OPC FOUNDATION

PI OLEDB Enterprise

ORACLE

PI JDBC

INFOR

ISO

PI System

Java

IFS

MINCOM

Ventyx

CA.GOV

PI Notifications

PI Web Services

ERP and Asset Management Systems

PI Data Access family of products

SAP MII

INFOR

Microsoft BizTalk Server

Microsoft SQL Server
Analysis/Reporting Services

IBM maximo

ORACLE

Microsoft Silverlight

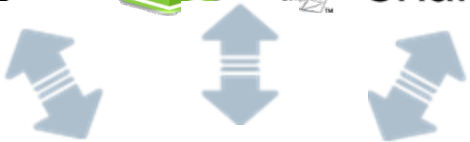
Microsoft SharePoint

CERTIFIED FOR COMPLIANCE OPC FOUNDATION

Microsoft Visual Studio

Java

TIBCO
The Power of Now™



PI System Access (PSA) license

PI System

Previous talks…

- Condition-based maintenance for better asset reliability (Maximo)
  - GenPower & DTE Energy (power industry)

- Production Costing
  - RockTenn (paper industry)

- Quality (SAP)
  - Klabin (paper industry)

Examples – previous talks

- UC 2009
  - Using PI to Back-Test Usage and Condition Based Maintenance Strategies to Predict Quantifiable Benefits Prior to Deployment in Asset Management
- UC 2010
  - Enterprise Integration and PI Data Access
- UC 2011
  - Using PI System Data and Events in your Enterprise and Line of Business Systems
- vCampus Live 2010
  - Enterprise Business System Integration Using PI Data Access
- vCampus Live 2011
  - Hands on Lab - SAP and Maximo integration using Web Services and PI Notifications

Business integration – via event frames

Integration w/Production
(SAP PP/PI)

Microsoft BizTalk Server

Microsoft SAP Adapter

PI System

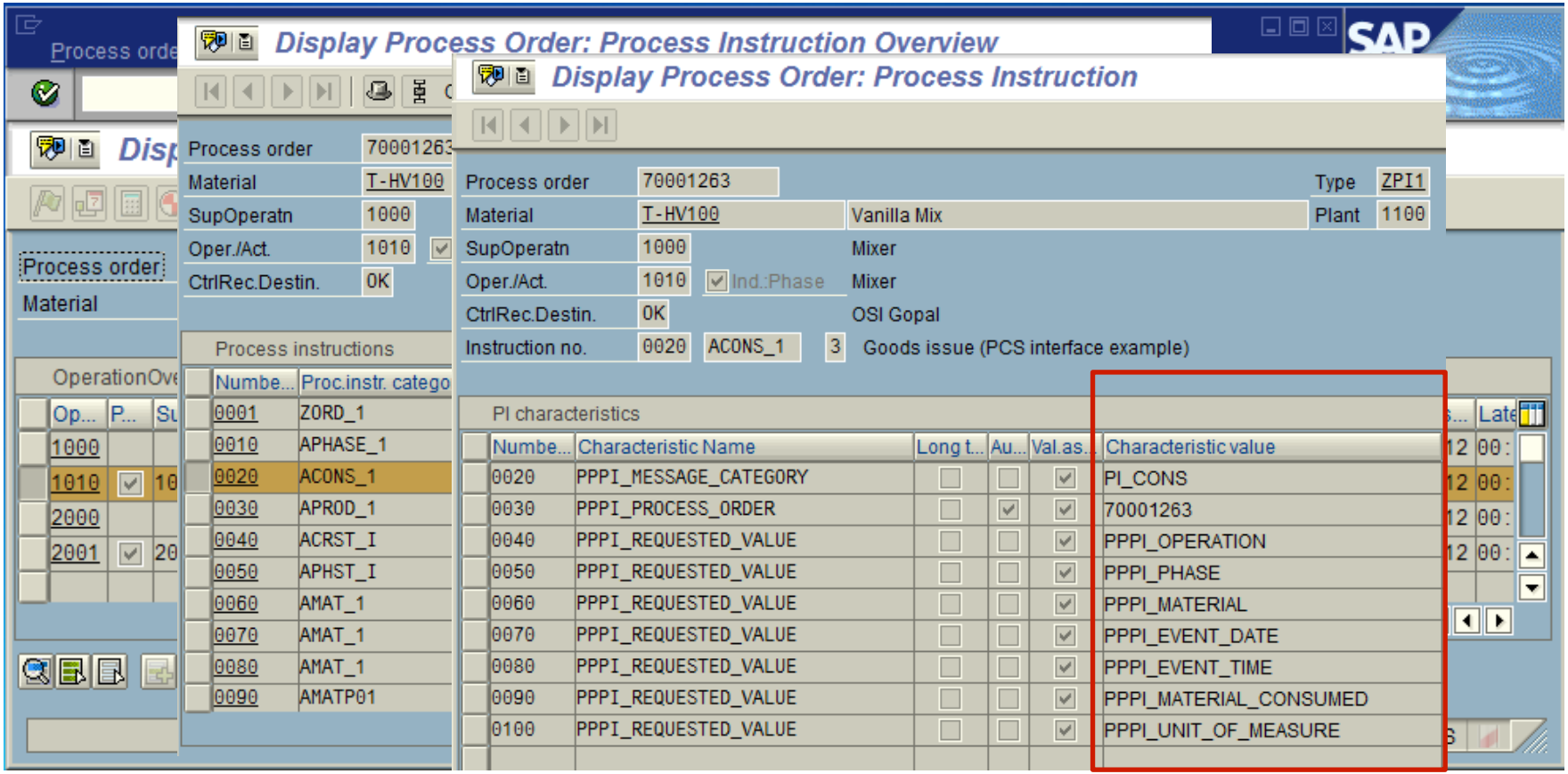
Message Monitor: Display Message

Plant	1100
Proc.Message Cat.	PI_CONS
Sender	OSI_GOPAL
Test	

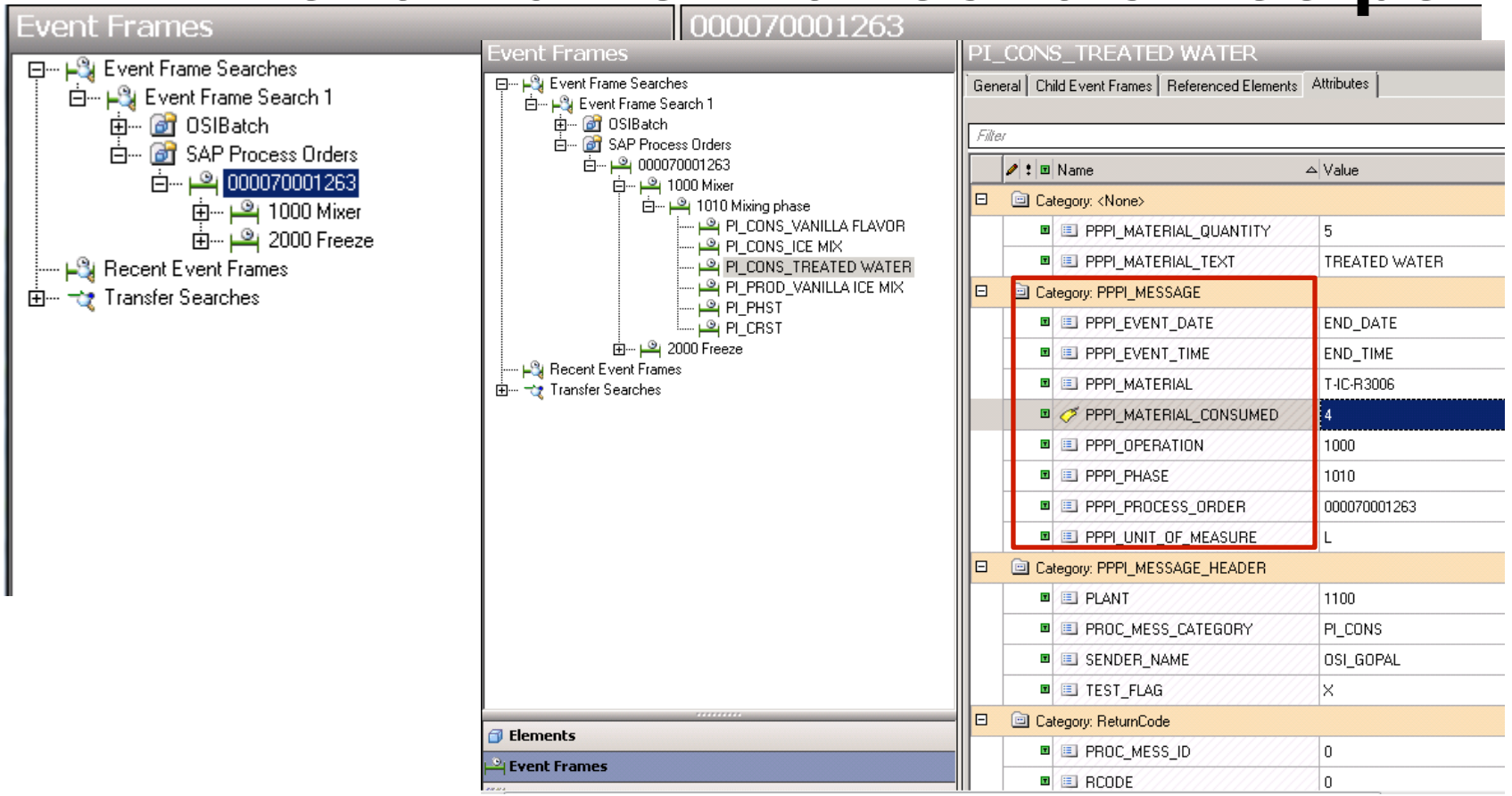
Message characteristics

Characteristic	R..	T	V	Char. Value
PPPI_PROCESS_ORDER	☑	☐	☑	70001263
PPPI_EVENT_DATE	☑	☐	☑	11.04.2012
PPPI_EVENT_TIME	☑	☐	☑	10:17:00
PPPI_OPERATION	☐	☐	☑	1000
PPPI_PHASE	☐	☐	☑	1010
PPPI_MATERIAL	☑	☐	☑	T-IC-R3006
PPPI_MATERIAL_CONSUMED	☑	☐	☑	4.0000
PPPI_UNIT_OF_MEASURE	☑	☐	☑	I

SAP Process Order (control recipe)



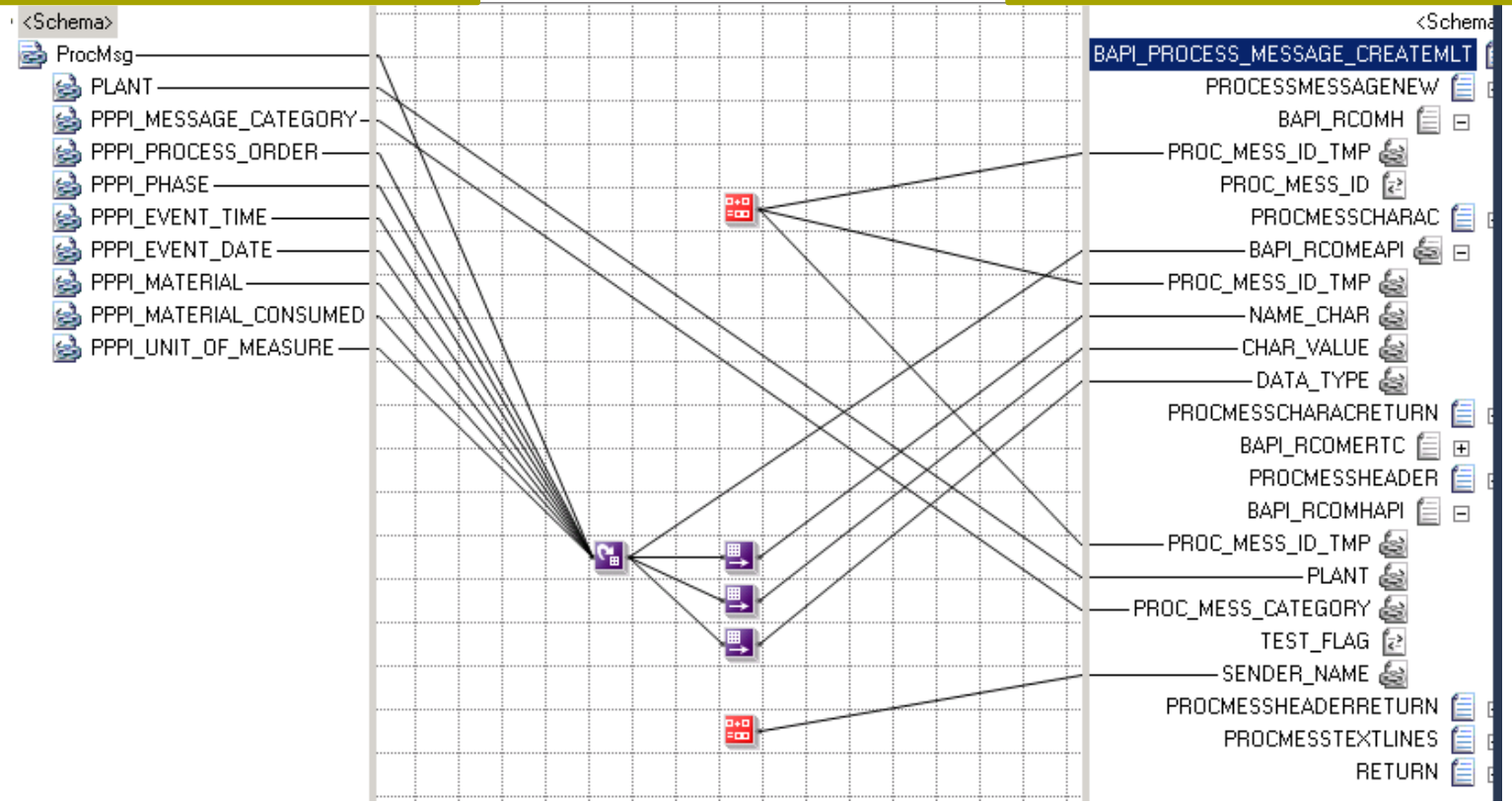
PI Event Frame with control recipe



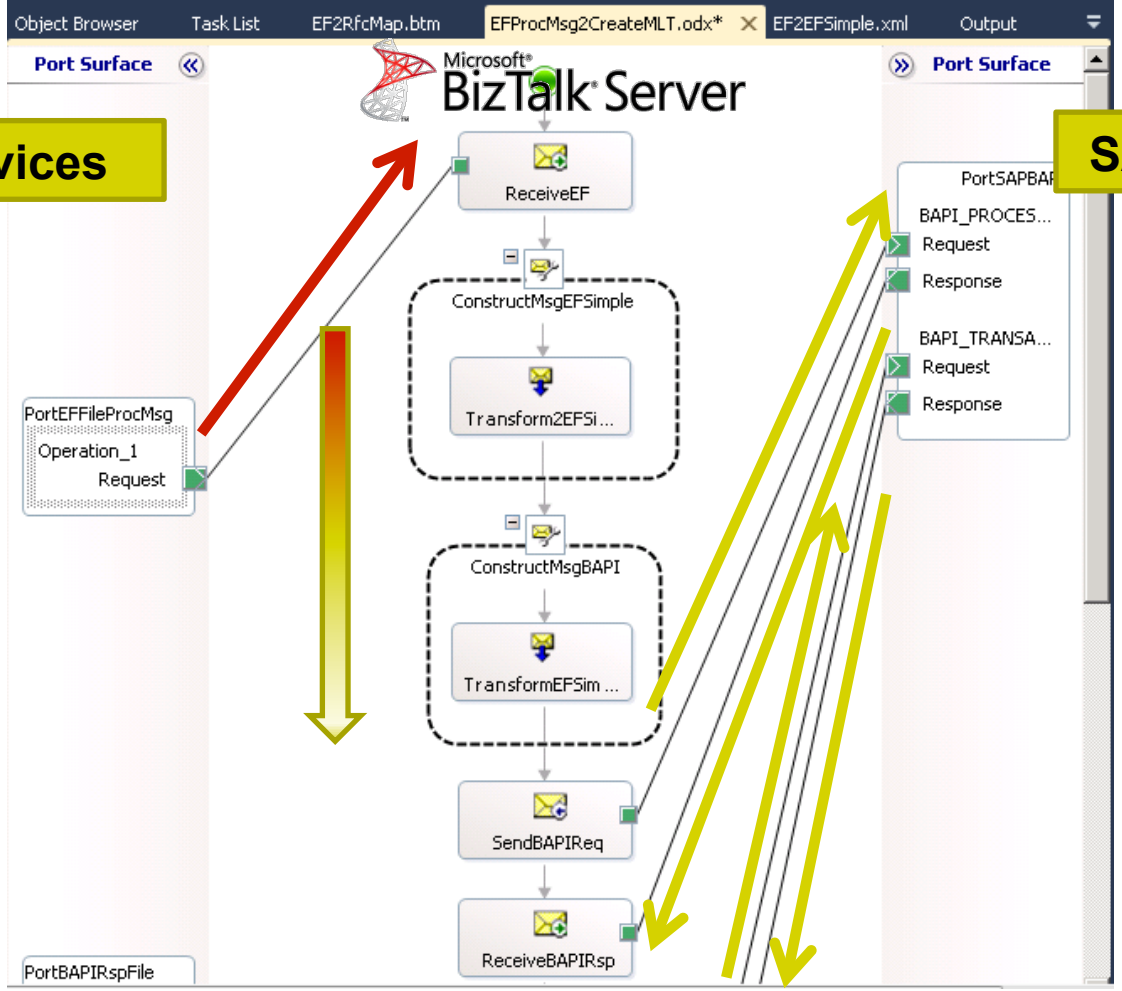
PI Web Services or a proxy

Microsoft BizTalk Server

SAP Web Services



PI Web Services



SAP Web Services

Business integration – via event frames

- Integration w/Production (SAP PP/PI)

  - Process Order Message
    - Control Recipe hierarchy (in event frames)
    - Process Messages for CONS, PROD, PHASE_STATUS…
    - PI Web Services & SAP Web Services (RFCs, BAPIs…)
    - Microsoft BizTalk as the middleware with Microsoft SAP Adapter

BAPI_PROCESS_MESSAGE_CREATEMLT	**Process Message Create Multiple**
BAPI_PROCORDCONF_CREATE_TT	**Process Order Confirmation Time Ticket**

Takeaways – Line of Business integration

- What, Why, and How
- http://vCampus.osisoft.com
  - Users Conference 2012 Special
    - 45 day free trial subscription for new members
    - At the Social Networking Lounge (Yosemite)
- Other topics
  - Using SAP, Maximo, Oracle, Infor… asset master data in the PI System
  - Visual integration (shared asset naming conventions, data models, loosely coupled URLs…)
  - Business Intelligence, Reporting
    (SAP BusinessObjects, SAP Crystal Reports, IBM Cognos, SAS…)

Using the PI System with SAP HANA

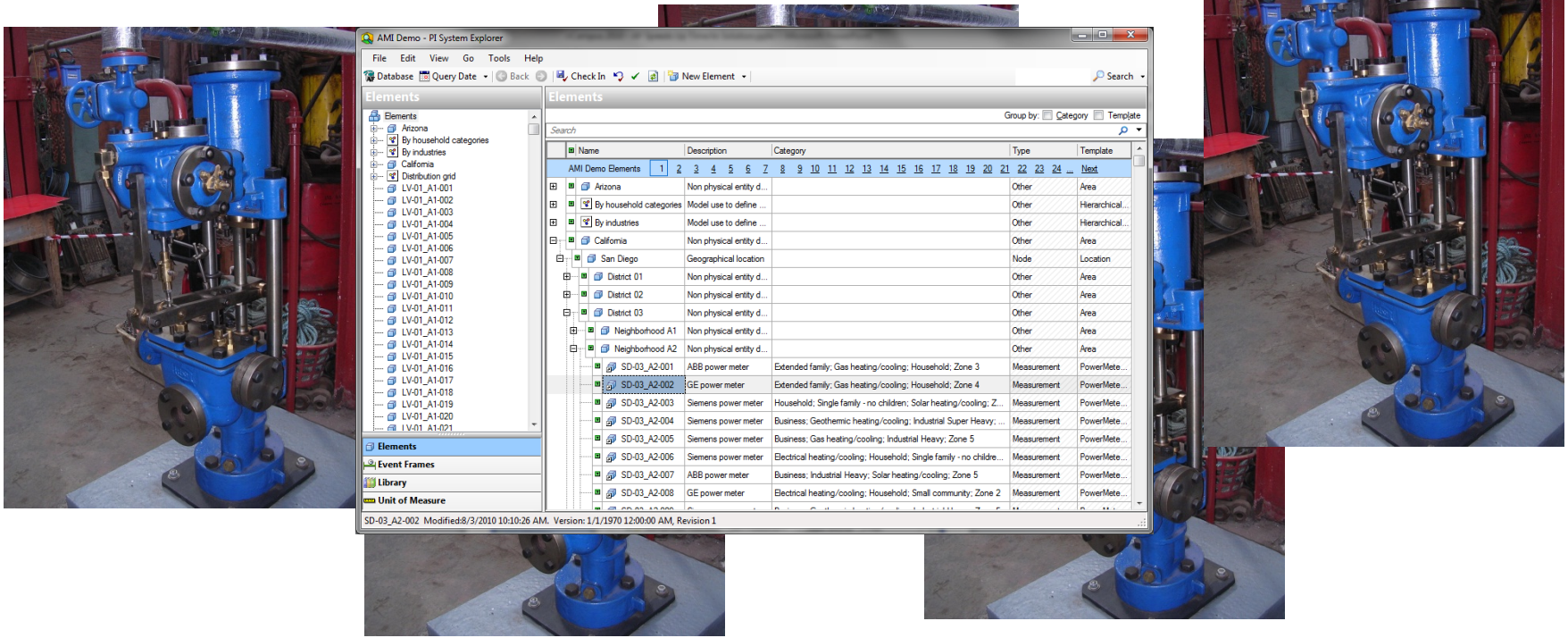
SAP BusinessObjects

Whether you have a PI System for a single facility…

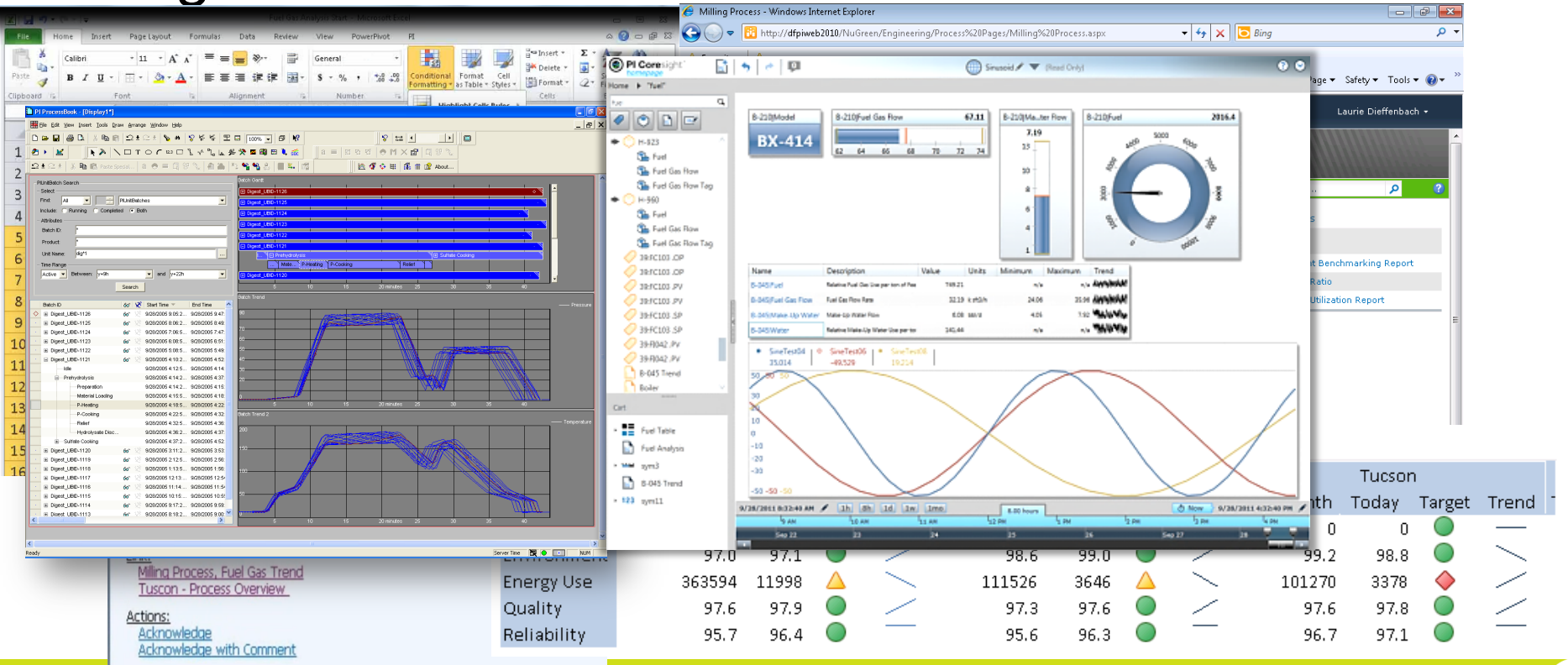
Or a federated PI System managing data from a global fleet of operational assets…

How can you glean more power from your data?

…of course you start with an AF model to map raw data tags to physical assets



Then dive deep into the behavior of individual assets using our rich set of asset-centered PI Clients…



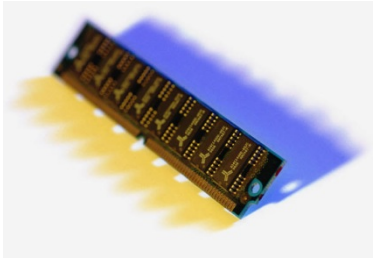
Broad Data Analysis

- Multi-dimensional arrays
- Complex relationship discovery
- Performance, productivity, efficiency, …
- Reporting

Then, you may want to leverage 3rd party business analytics tools…

Such as SAP Business Objects on HANA

What is SAP HANA?



- High-performance ANalytical Appliance
- In-Memory Relational Database
- No Star Schema. Lower TCO.
- Fast, Efficient Business Analytics on Big Data
- Today SAP HANA Natively Supports:
  - Netweaver BW
  - SAP BusinessObjects
  - Smart Meter Analytics
  - CO-PA Accelorator

SAP BusinessObjects BI 4.0

- Reporting
  - Crystal Reports, Excel
- Ad-Hoc Analysis
  - Explorer, Web Intelligence
- KPI's
  - Dashboard Design (Xcelsius)

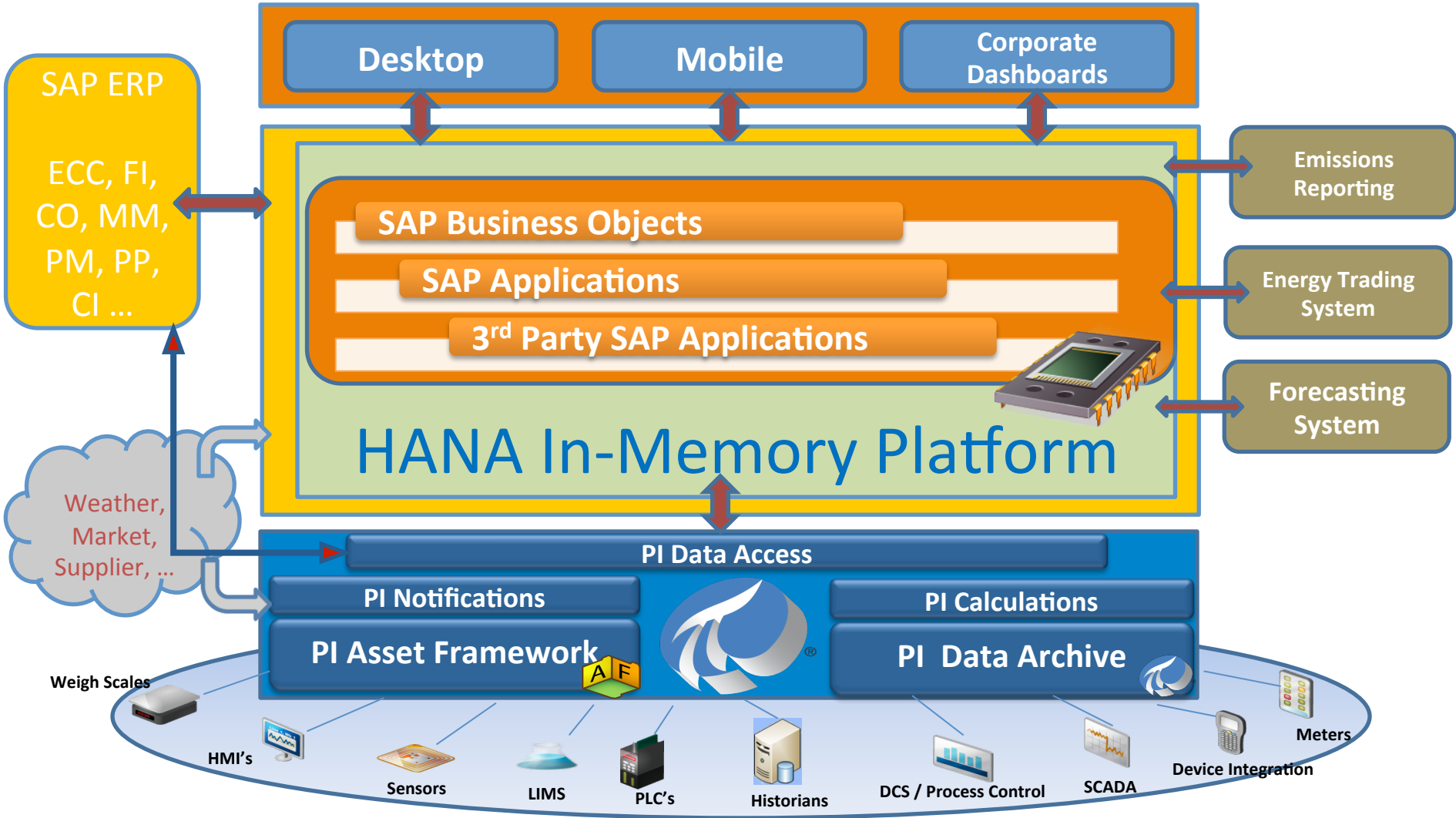
Why SAP HANA and the PI System?

- PI System optimized for heterogeneous time-series data
  - Analyze individual data streams over long times
  - Gain deep insight on selected variables
- HANA optimized for wide relational queries
  - Analyze large volumes of data sources in homogeneous time
  - Gain broad insight about complex relationships

PI System and SAP HANA

Bring together large volumes of both PI System, SAP ERP and transactional data for BI and Analytics using BOBJ

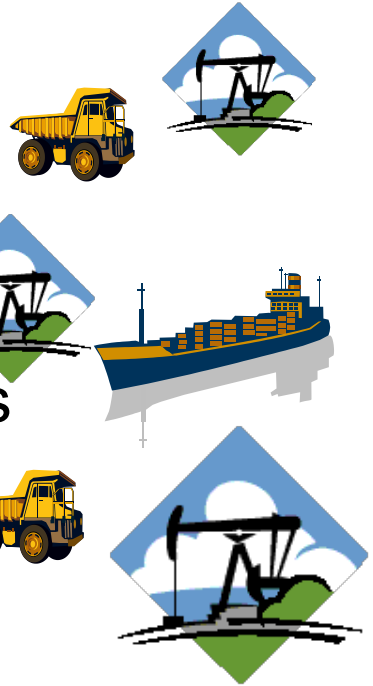
- Enterprise Asset Management
  - Drive intelligent CBM
- Energy Management


Desktop
Mobile
Corporate Dashboards
SAP ERP
ECC, FI, CO, MM, PM, PP, CI …
SAP Business Objects
SAP Applications
3rd Party SAP Applications
HANA In-Memory Platform
Emissions Reporting
Energy Trading System
Forecasting System
Weather, Market, Supplier, …
PI Data Access
PI Notifications
PI Calculations
PI Asset Framework
PI Data Archive
Weigh Scales
HMI's
Sensors
LIMS
PLC's
Historians
DCS / Process Control
SCADA
Device Integration
Meters

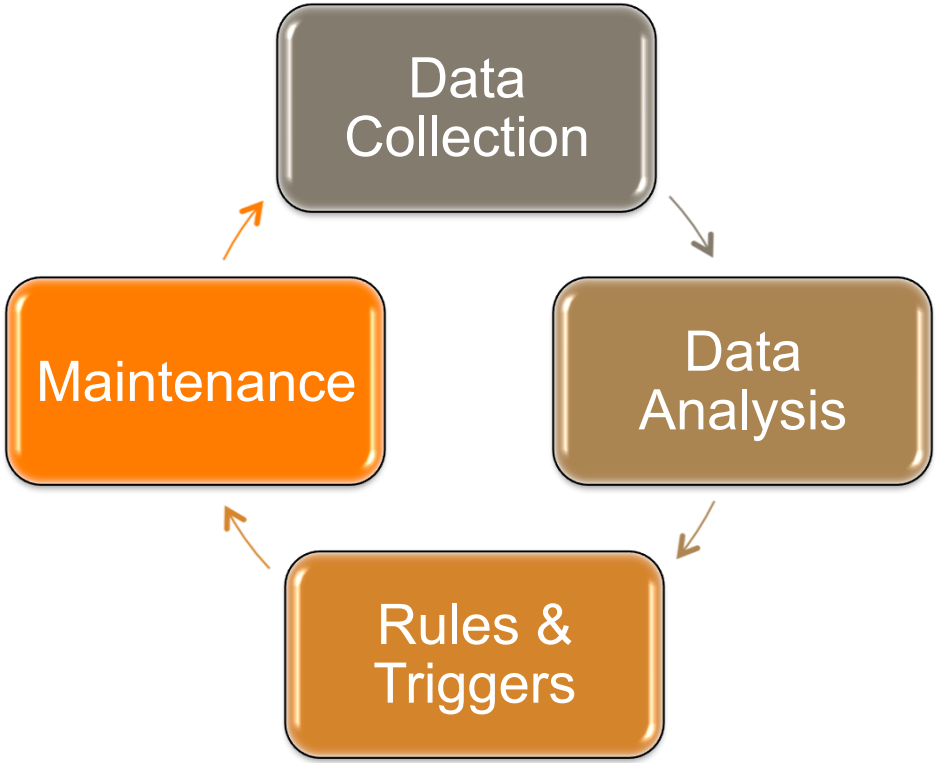
Enterprise Asset Management (EAM)

Investigate the performance of assets based on

- Equipment manufacturer
- Maintenance history
- Environmental Operating conditions
- Downtime and Overall Equipment Effectiveness
- Startups / Shutdowns
- Duration of out-of-band operation
- Shifts, days, operators
- …

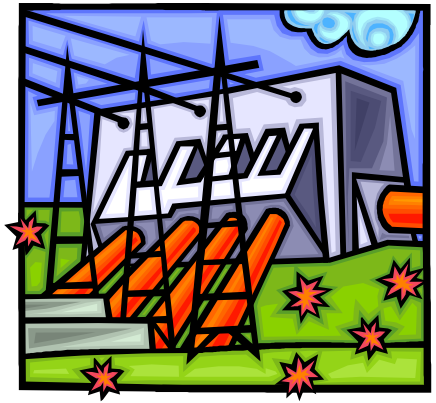


Gain Additional Insight on CBM



Energy Management

- Cost / benefit of adjusting an energy supply portfolio (electric, gas, fuel, steam, renewables)
  - Based on operational activities
  - Based on time-of-year, time-of-day
  - Based on shifting peak load



- Modeling & Forecast

PI System and SAP HANA Roadmap

- SAP developing next-generation HANA-based Applications
  - Roadmap includes both industry solutions and ERP

- HANA as a unified analytical platform to bridge data from PI System, SAP ERP, and other sources

PI System and SAP HANA Tomorrow

OSIsoft and SAP working together to design tools to optimize your investment in these systems and gain Enterprise Solutions

Seeking customer engagements on use cases, proof of concept, etc

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