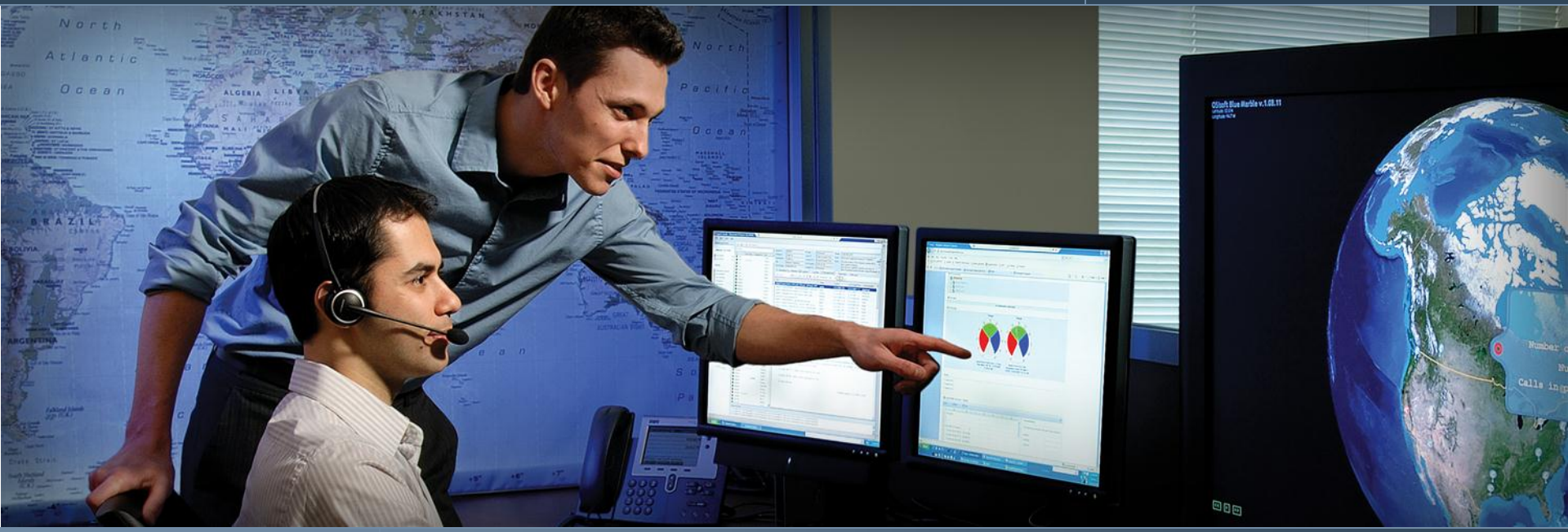
Regional Seminars
Sofia - Bulgaria



PI System Products Overview

Hans Otto Weinhold , Sr. Customer Support Engineer

Hans-Otto@osisoft.com

Empowering Business in Real Time.

Turn Real-time Data Into Actionable Information

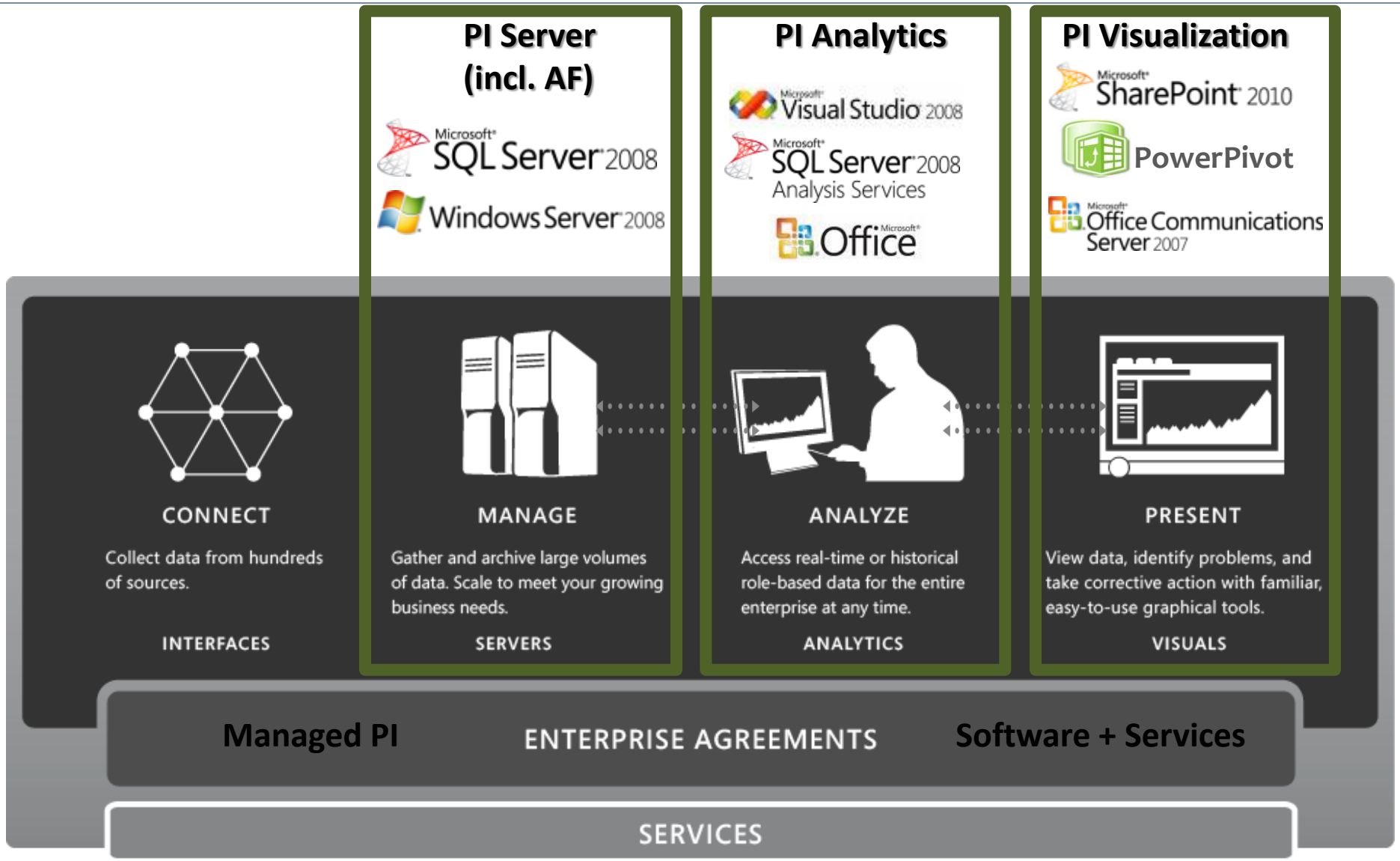
THE PI TECHNOLOGY GIVES THE POSSIBILITY TO PUT IN PLACE BUSINESS SOLUTIONS

PROBLEMS	TURN REAL-TIME DATA INTO ACTIONABLE INFORMATION	RESULTS
ENERGY RESOURCES AND UTILISATION	DATA → INFORMATION → ACTIONS	ENERGY AND RESOURCES MANAGEMENT
EQUIPMENT STATUS		CONDITION-BASED MAINTENANCE
KNOWLEDGE PERENNIALITY		KNOWLEDGE TRANSFER AND RETENTION
PROCESS CONDITIONS AND QUALITY	PI INFRASTRUCTURE — BUSINESS DECISIONS	PRODUCTION OPTIMIZATION
ENVIRONMENTAL REQUIREMENTS AND REGULATIONS		COMPLIANCE

Strategic Alliances - Overview

OSIsoft	Microsoft	SAP
Real-time Data Infrastructure	Productivity & Infrastructure	Line of Business Connectivity

Microsoft Complimentary Technologies

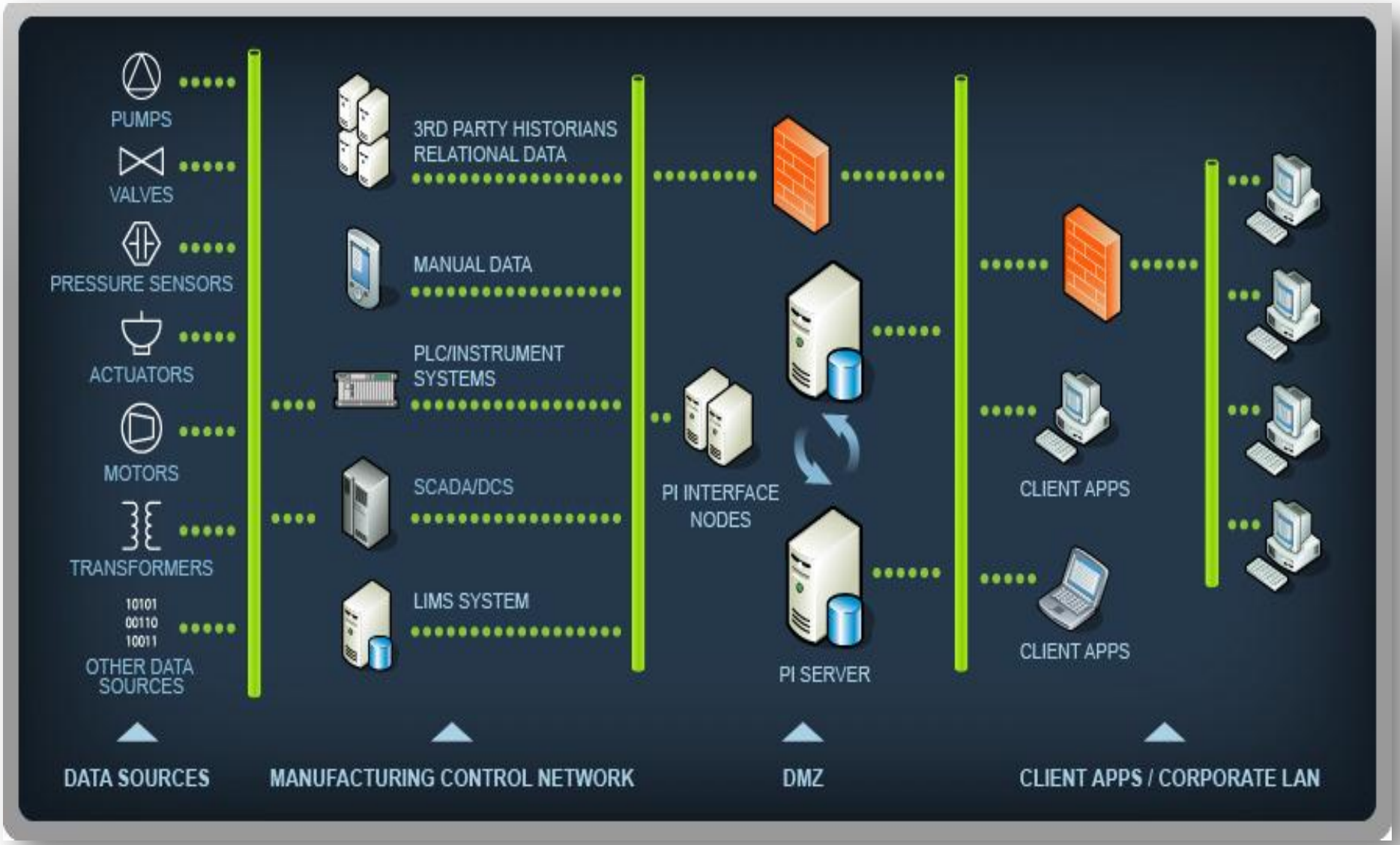


Empowering Business in Real Time.

Strategic Alliances – SAP Integration

- OSIsoft Partner Since 1996
- SAP Production Planning-Process Industries (SAP PP-PI) module
- SAP Plant Maintenance (SAP-PM) module
- SAP Quality Management (SAP-QM) module
- The OSIsoft Business Package for SAP Portal
- Member of ES Community
- Member of Value Network for Chemicals, Mining, and Utilities
- Enterprise Services for SAP Enterprise Service Repository
- AMI MDUS as SAP Endorsed Business Solution (EBS) and participant in SAP Lighthouse Council

The PI System: Generic Architecture



PI System Overview

Connect

Collect data from hundreds of sources.

Interfaces

Manage

Gather and archive large volumes of data. Scale to meet your growing business needs.

Servers

Analyze

Access real-time or historical role-based data for the entire enterprise at any time.

Analytics

Present

View data, identify problems, and take corrective action with familiar, easy-to-use graphical tools.

Visuals

The OSIsoft PI System is the highly scalable and secure real-time and event infrastructure that connects people with the right operational and manufacturing information at the right time to analyze, collaborate, and act.

CONNECT- Interfaces

Connect to over 400 data systems and sources

Measures and aggregates a broad range of data types

Connect

Collect data from hundreds of sources

- Real-time
- Relational
- Transactional
- Custom
- Web Services
- AMI
- IT

MY SUPPORT | PRODUCTS | DOWNLOAD CENTER | KNOWLEDGE CENTER | CONTACT US

PI Interfaces

PRODUCTS

- PI Servers
- Client Products
- Layered Products
- OPC
- Interfaces
- COM Connectors
- System Management
- RLINK
- ECHO
- PI Protocol Converter
- OSIsoft MDUS
- Prerequisite Kits

RELATED PRODUCTS

- COM Connectors

PI Interfaces Search

siemens

Search | List All

• Standard • Maintenance • 3rd Party • Non-Standard

Name	Platform	Current Version	Shipping Version	Part#	APS Status
Siemens RXS4 Meter	NTI	1.0.0.1	1.0.0.1	PI-IN-SI-RXS4-NT	
Siemens S5 PLC				See Comments	
Siemens S7 PLC				See Comments	
Siemens S7-200 PLC's				See Comments	
Siemens SIMATIC Batch Interface	NTI	1.0.1.0		PI-IN-SI-SBAT-NTI	
Siemens Simatic Net (TI-505, S5)	NTI	1.4.2.1	1.4.2.1	PI-IN-SI-SIMAT-NTI	
Siemens Simatic Net S7	NTI	1.0.0	1.0.0	PI-IN-SI-S7-NTI	
Siemens SINAUT				See Comments	

High Availability - concern and goal

Software Fault-Tolerant System

- Interface Failover
- Buffering
- PI Server Replication
- *SDK Services (discovery, failover, and load distribution)*
- *N-way Buffering of Non-Interface Data (e.g. PI-SDK)*
- *Replication of Archive Edits among Server Nodes*
- *Promotion of Secondary Nodes on Primary Failure (configurable)*

Near-Independent, Physically Separated Servers

- No hardware/network restrictions, no limit on Server nodes

General Benefits

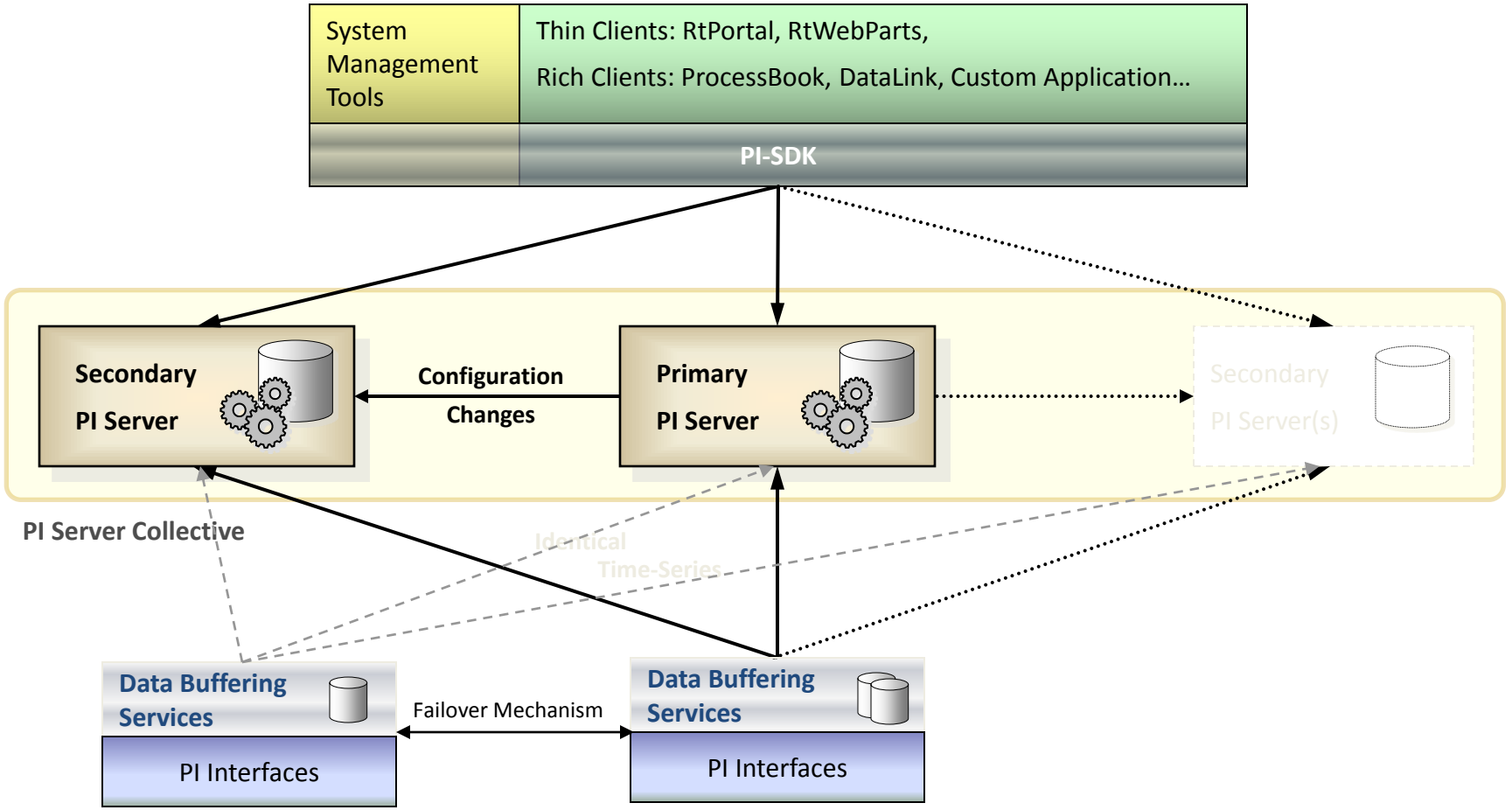
- Availability, end-USER sees one logical system
- Scalability, system load can be distributed
- Flexibility, accommodates your environment

For IT and Management

- Reduced Total Cost of Ownership (TCO)
- Allows Disaster Recovery Plans

Extra benefit: Hardware and Software just out of the box

PI HA Architecture



Empowering Business in Real Time.

everything is changing over time

Designed for time series and non time series data:

- High Performance (storage AND retrieval)
  e.g. Timestamp Resolution ~ 15 µs; Sustained Read from Archive ~300.000 values/sec
  and write 100.000 values/sec depends on hardware + multiple users
- Scalability (no practical limits in growth)
  System Size 1.000 to 2.000.000 Data Streams (32 bit) # 1.000 to 10.000.000 Data Streams (64 bit);
  Number of Users limited only by hardware
- High Availability (backbone for business critical applications)
  High Availability for Server collectives and Client failover, actual Part of Platform Release 1
  in development load balancing, peer-to-peer replication
- Security (access to all data with no risk for operations)
  Configuration & Data Security by Tag, Element and User
- Extensibility (be prepared for unplanned integration)
  Supported Standards like OPC DA, OPC HDA, OPC A&E, OPC XML-DA, ODBC, OLE DB, COM, .NET, SNMP, Perf.Counter
- Crossing boundaries (technical, organizational, regional,...)
- Protection of investment: Integration of legacy systems
  e.g. Data from 20 year old DCS shown in Excel Services
- Unified data access to all operations

MANAGE - Server

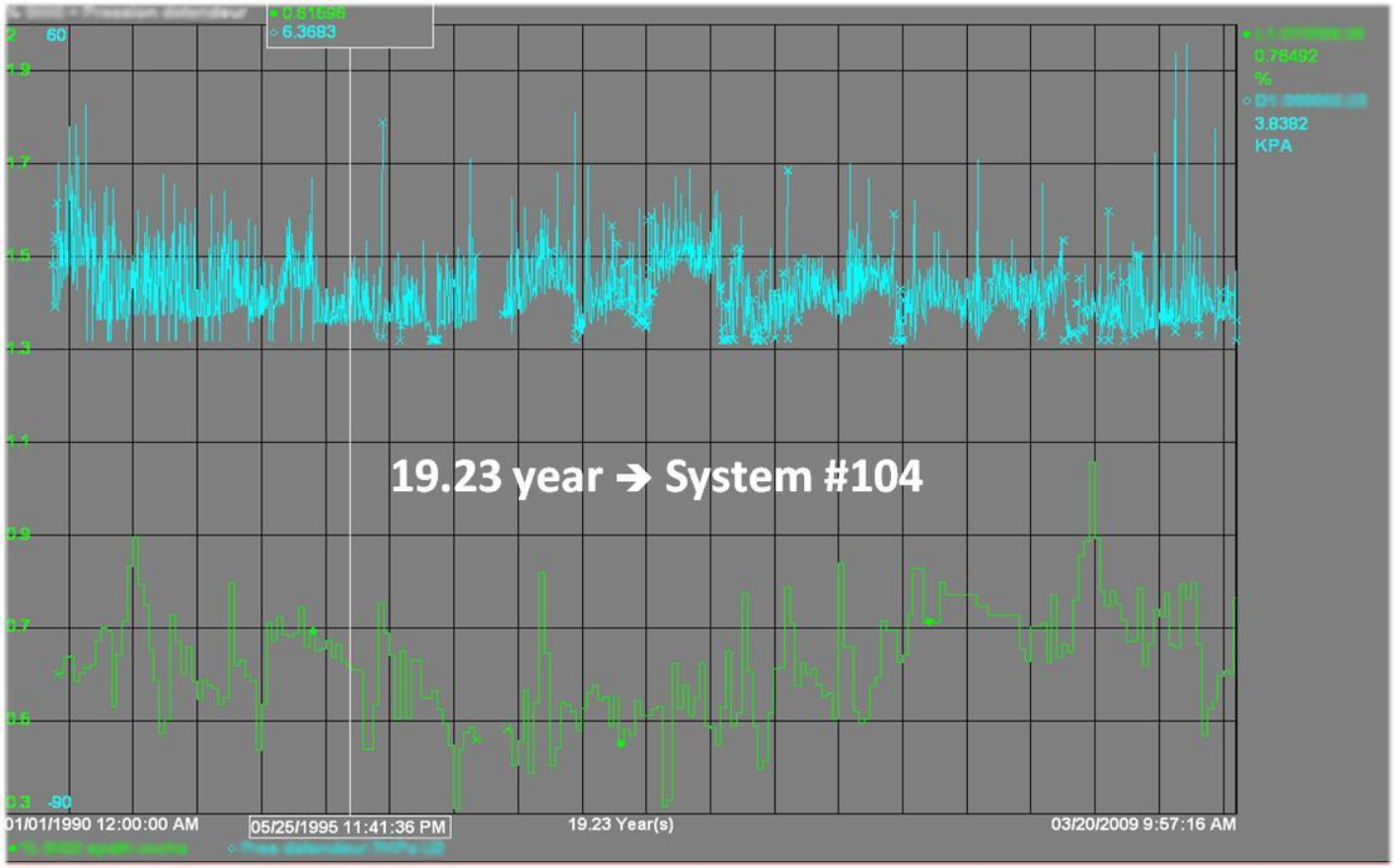
Reliably gather, archive and serve large volumes of data

Designed for time series and non time series data

Manage

Gather and archive large volumes of data. Scale to meet your business needs.

- PI Server
- System Management
- System Access
- PI Asset Ffamework



Empowering Business in Real Time.

The PI Data Access layer

The PI Data Access Components

- PI ODBC Client
- PI OLEDB Provider
- PI JDBC Driver
- OPC
  - OPC DA/HDA Server
  - OPC UA Server
- Web Services
  - PI Web Services
- SDKs
  - PI SDK
  - AF SDK

Data Access: The 2010 Wave

Java

SAP NetWeaver™

Microsoft® BizTalk® Server

Microsoft® SQL Server®
Analysis/Reporting Services

SAP MII

ORACLE®

TIBCO
The Power of Now™

Microsoft® Silverlight®

Microsoft® SharePoint®

PI JDBC Driver

PI Web Services 2010

PI OLEDB Enterprise 2010

OSIsoft SDKs

Asset Information / Metadata

Notifications

Analytics

Relational / Non Time Series Data

PI Server

PI Server Collective

Time Series Data

What is PI AF 2.x ?

PI AF 2.x is …

A set of tools for organizing data around your processes, operations, facilities and organization to support an information model.

Helping You to …

structure your data in a meaningful way to search and view it in the right context so problems can be solved faster.

MANAGE - Asset Framework

Contextualize, structurize and enrich data

Manage

Gather and archive large volumes of data. Scale to meet your business needs.

PI Server

System Management

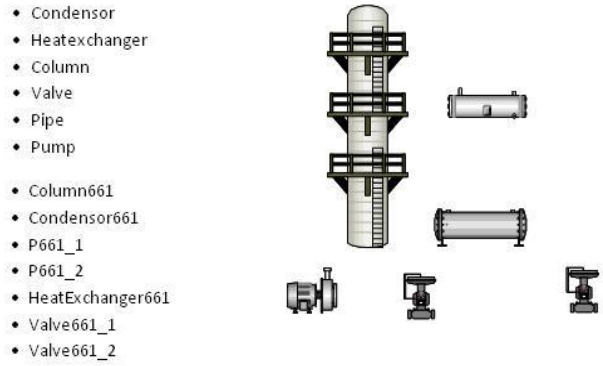
System Access

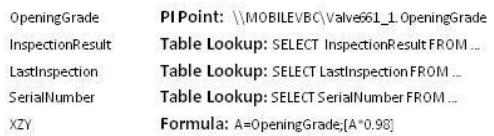
PI Asset Ffamework

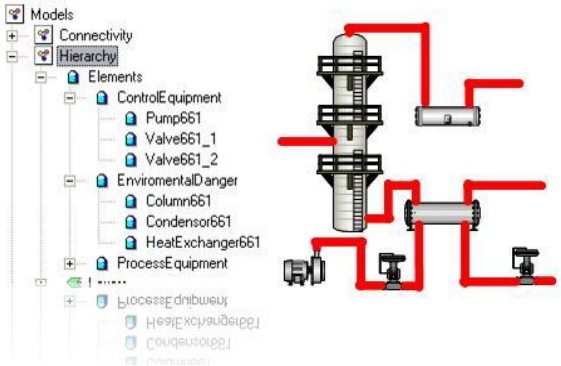
Represents the entire Asset Structure of the Plant

Shaping your data by:

1. **Defining types of assets** → Templates
   Schema how to attribute Elements
2. **Association to a "real" asset** → Elements
   Created from Template
3. **Describing the "real" asset** → Attributes
   having Units Of Measurements (UOM)
   can come via data references from everywhere
4. **Physical/logical asset structure** → Hierarchy
5. **Assets connectivity** → Models
   Model : Collections of connected elements







Empowering Business in Real Time.

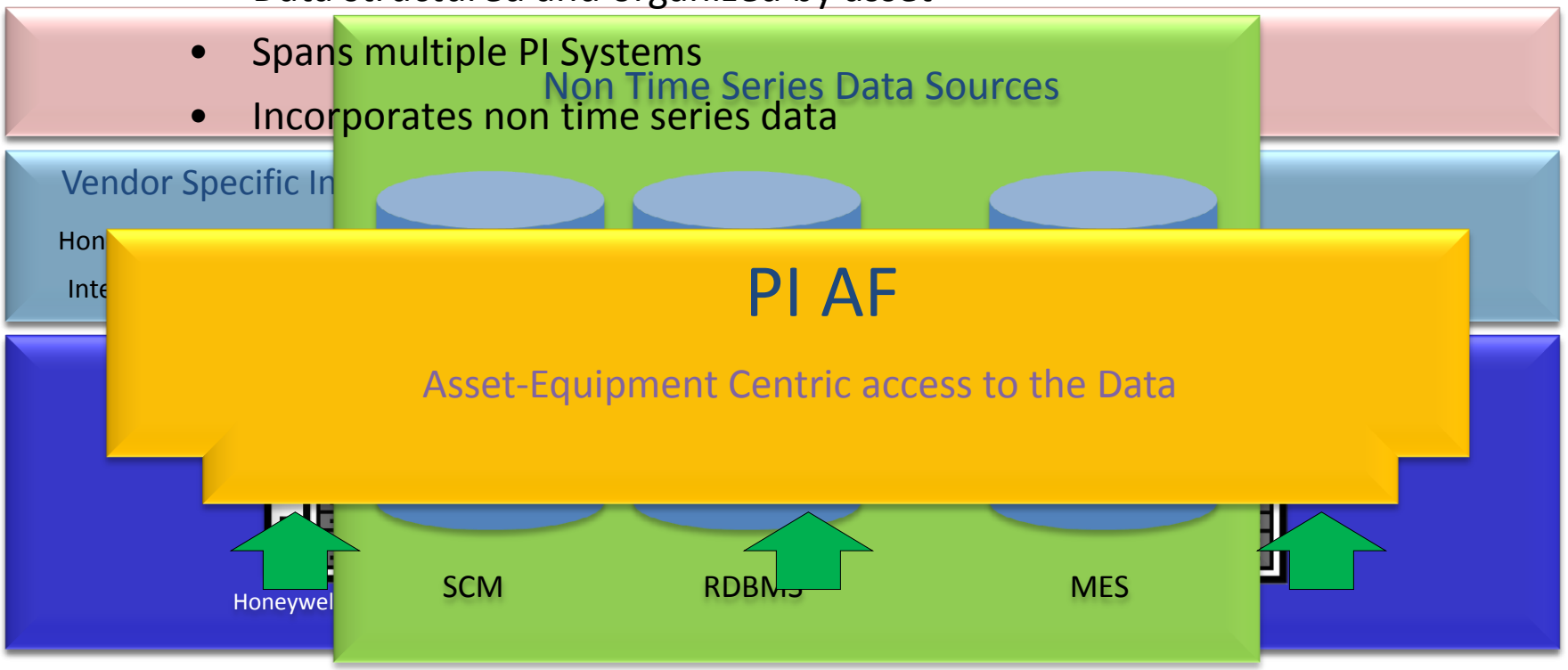
PI AF 2.x acronym

AF stands for either

- *Application Framework*
  - Users can build applications on top of AF
- *Analysis Framework*
  - AF is great to host calculations
- *Asset Framework*
  - AF is equipment centric

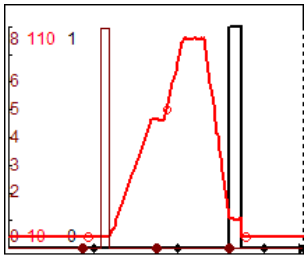
PI AF 2.x

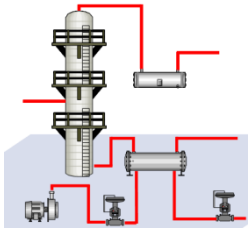
- Data structured and organized by asset
- Spans multiple PI Systems
- Incorporates non time series data

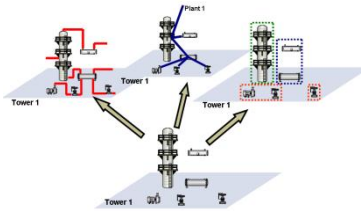


Empowering Business in Real Time.

Evolution







Tag **Module** **Element** **Asset**

History	Context	Connections	Unification
Connectivity PI – Archive	Aliasing Versions Hierarchies	Templating Flow sheeting “foreign” data Model analyses	“foreign” structures

Empowering Business in Real Time.

ANALYZE - Analytical Capabilities

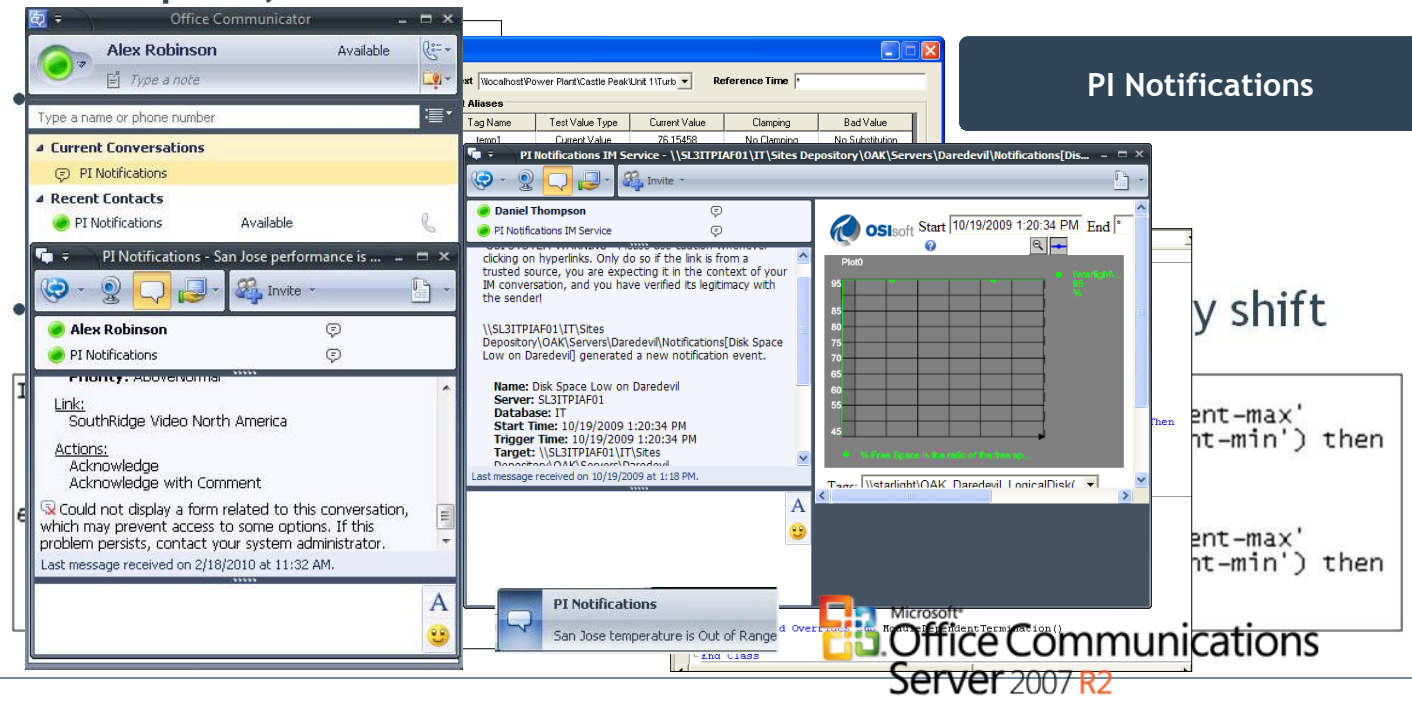
Access real-time or historical role-based data for the entire enterprise at any time.

- Advanced Computing Agent
- Performance Equations
- PI Notifications
- PI Reports™
- Batch
- Statistical Quality Control (SQC)

Convert real-time data into actionable information

Measure and improve business performance

- **Equations**, calculations, aggregations, filters, business rules
- CEP (Complex Event Processing) & Post processing
- **Reports, Notifications and Alerts**



Empowering Business in Real Time.

The PI Analytics: PI Performance Equations

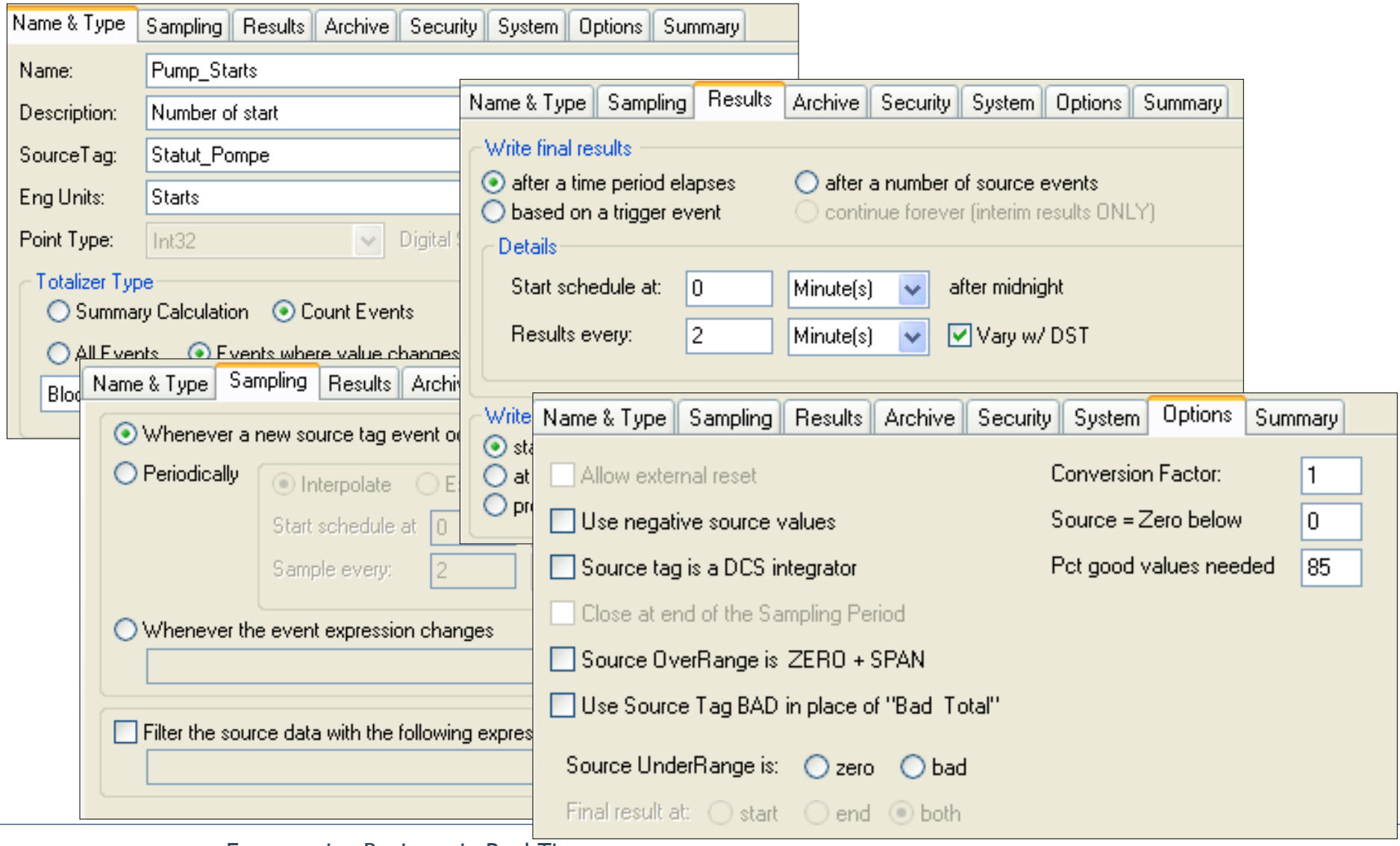
- Pump daily uptime

```
TimeEQ('04:123PUMP_STAT.DC','t','*',"ON")/3600
```

- High/Low alarm on tank level with alarm reset every shift

```
If ( Hour('*') = 6 or Hour('*') = 18 ) and Minute('*') = 1 Then
        If (TagMIN('DC1-LI-005.PV','*','*-5m') >= 'UO-Niveau-Reservoir-Floculent-max'
        or TagMax('DC1-LI-005.PV','*','*-5m') <= 'UO-Niveau-Reservoir-Floculent-min') then
                1
        else 0
else Max(PrevVal('DC1-LI-005.PV.Alarme.RQ','*-5s'),
        If (TagMIN('DC1-LI-005.PV','*','*-5m') >= 'UO-Niveau-Reservoir-Floculent-max'
        or TagMax('DC1-LI-005.PV','*','*-5m') <= 'UO-Niveau-Reservoir-Floculent-min') then
                1
        else 0)
```

The PI Analytics :PI Totalizer



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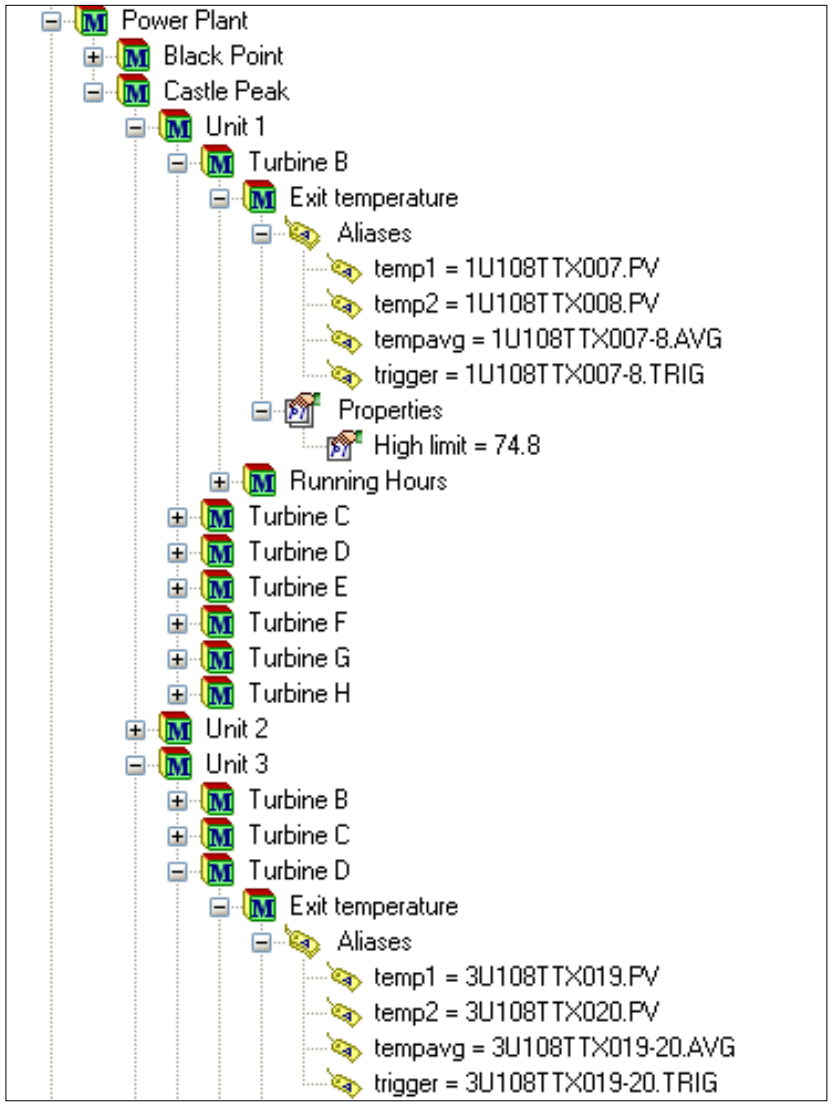
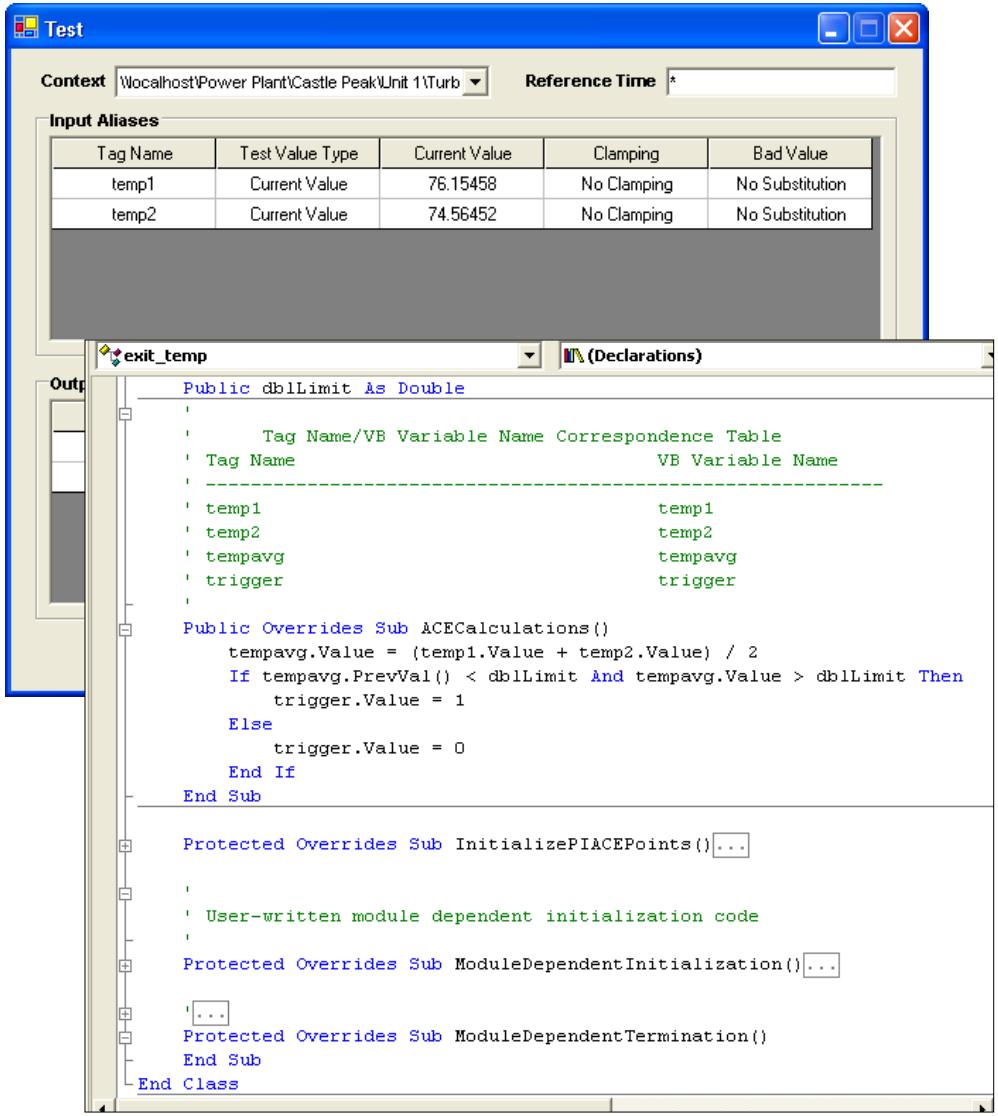
PI ACE (Advanced Computing Engine)





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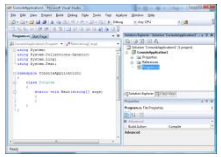
PI & StreamInsight Platform

StreamInsight Application Development

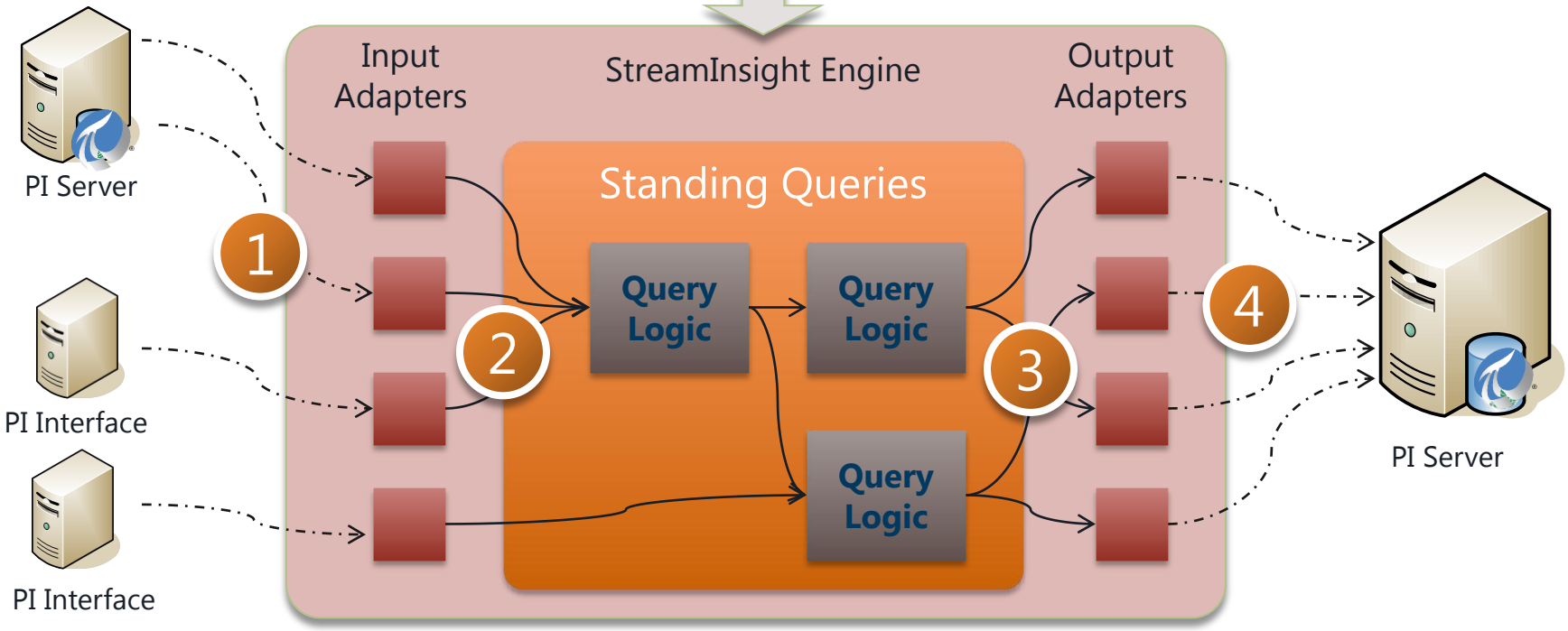


.NET
C#
LINQ

StreamInsight Application at Runtime

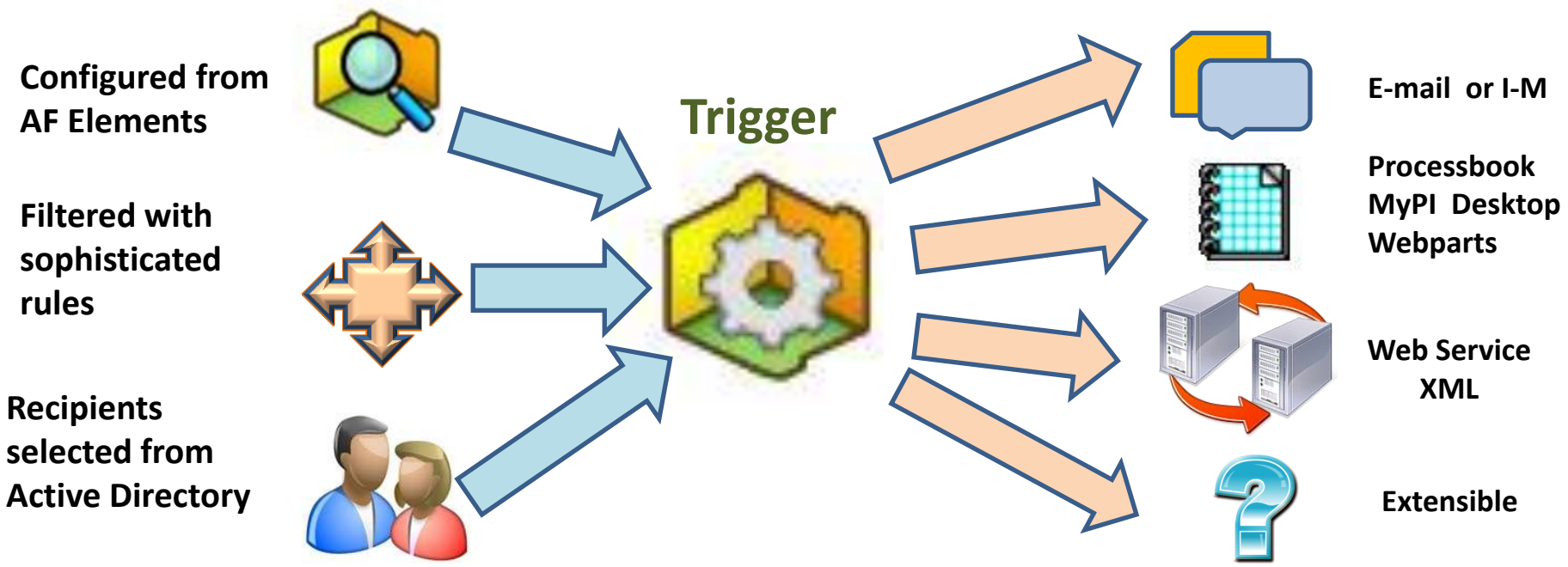
Event sources

Event targets



Empowering Business in Real Time.

PI Notifications: The Power of Templates…

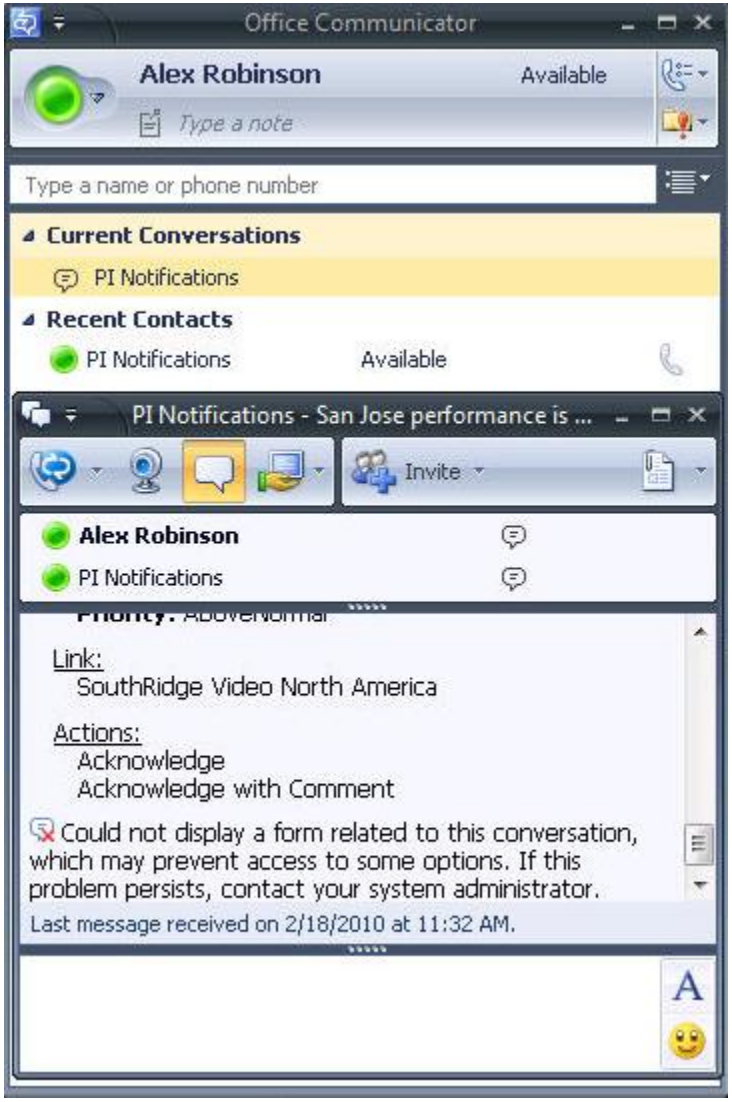


Define information once
- Fewer errors
- Automatically in sync
- Maintenance can scale

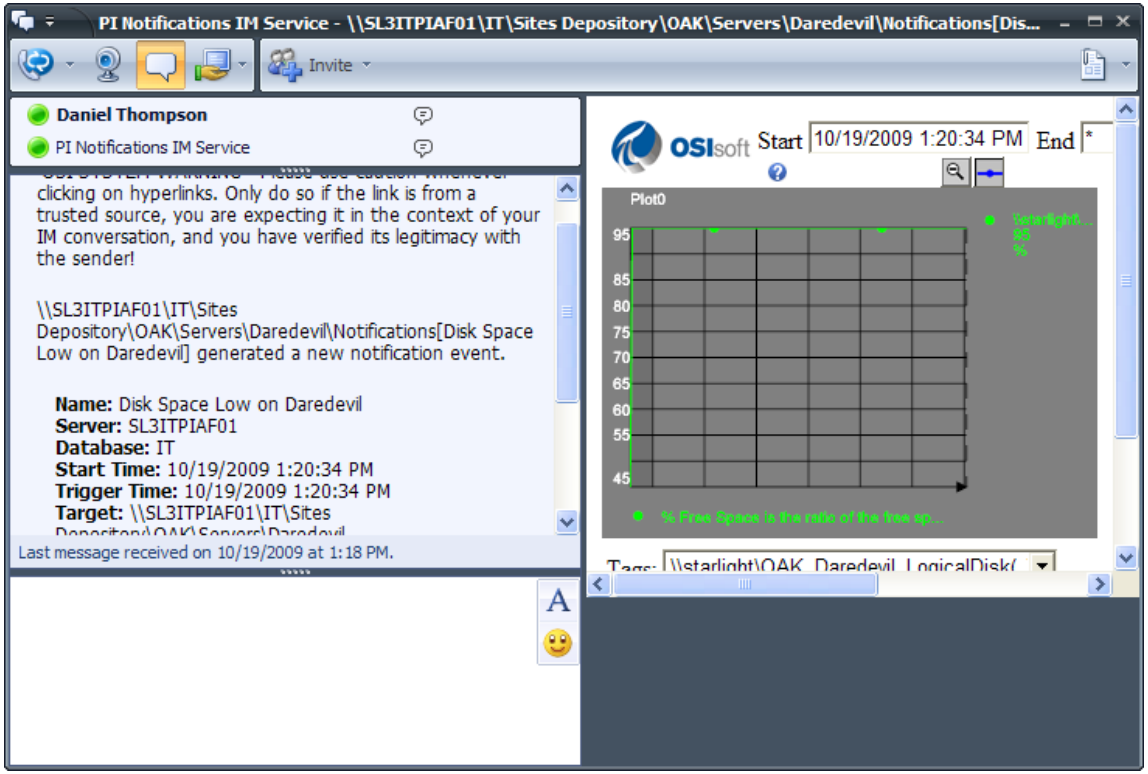
Override where necessary
- Change time rule
- Define specific content
- Add/modify subscribers

Go See: Using Templates to Speed Up Configuration of Your PI System

PI for Office 2010
PI Notifications and OCS

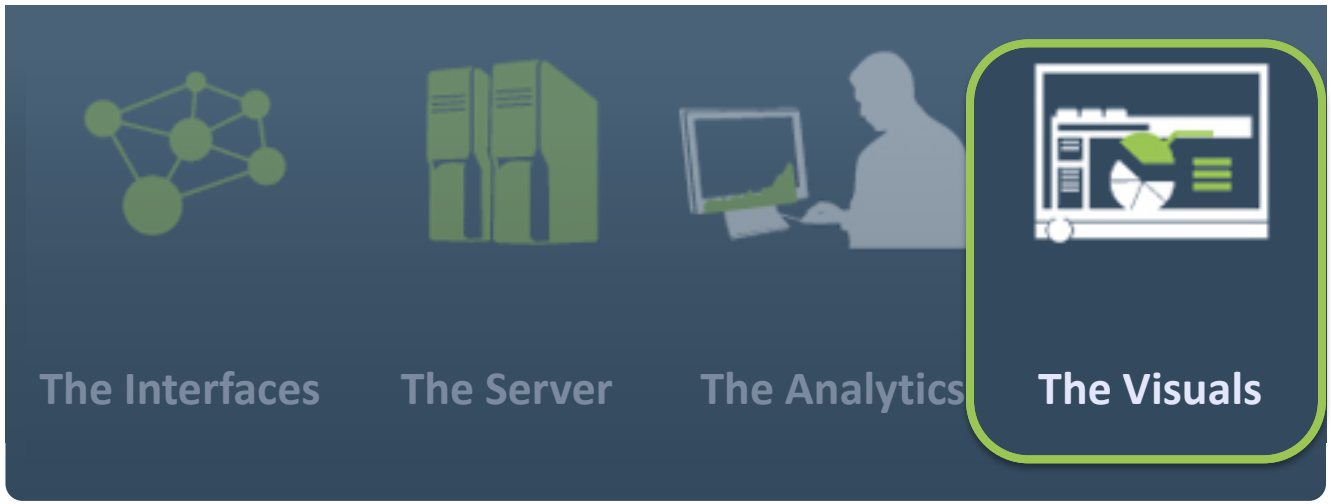


Microsoft Office Communications Server 2007 R2



Empowering Business in Real Time.

The PI System: Visualize

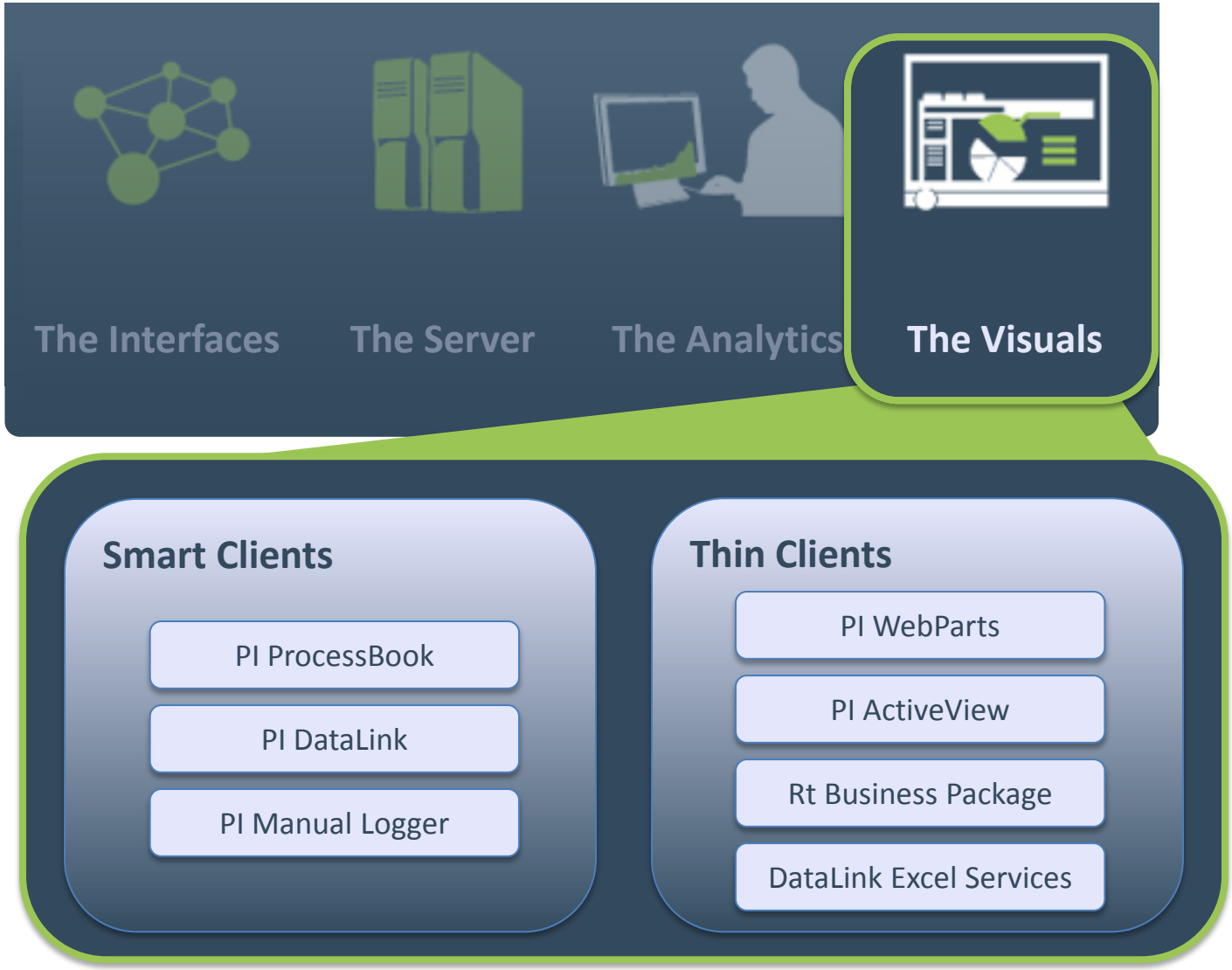


The decision makers can use the well-known tools like:

- OSIsoft PI ProcessBook
- Microsoft Office Excel or Microsoft Office SharePoint
- SAP Enterprise Portal

The Visuals stimulates the creativity and gives solutions to end-users for solving business problems.

The PI System: Visualize



Empowering Business in Real Time.

Microsoft Business Intelligence
Get more out of products you already own

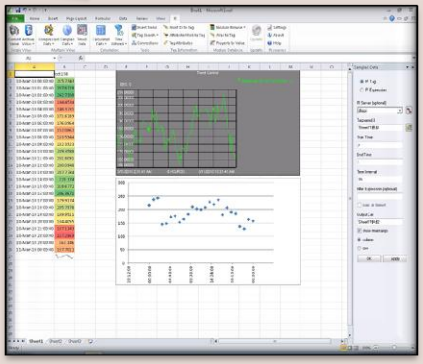
Familiar User Experience
Self-service Access and Insight
Data Exploration and Analysis
Predictive Analysis
Data Visualization
Contextual Visualization

Integrated Content and Collaboration
Thin Clients
Dashboards
BI Search
Content Management
Compositions

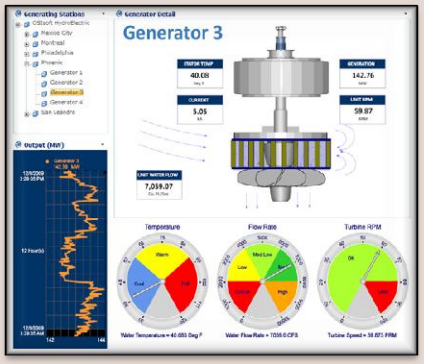
Data Infrastructure and BI Platform
Analysis Services
Reporting Services
Integration Services
Master Data
Data Mining Services
Data Warehousing

Empowering Business in Real Time.

PI for Office 2010

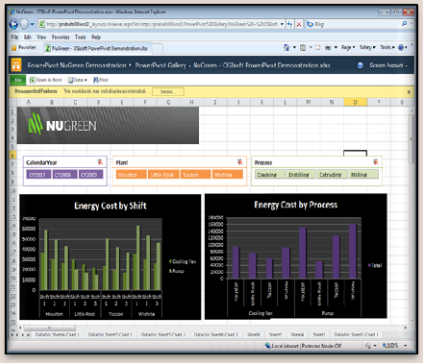


PI DataLink for Excel 2010



PI WebParts for SharePoint 2010

PI and PowerPivot for Excel 2010

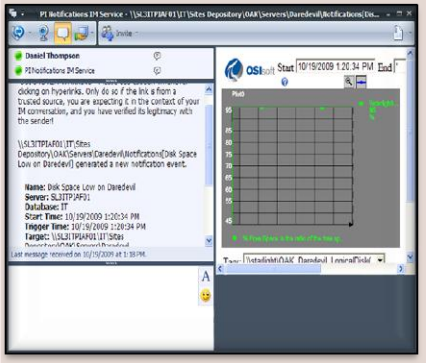


PI and PowerPivot for SharePoint 2010

PI OLEDB Enterprise 2010

PI Web Services 2010

PI Data Access Technologies



PI Notifications 1.1 OCS R2 Delivery Channel

Empowering Business in Real Time.

VISUALIZE - Visualization Capabilities

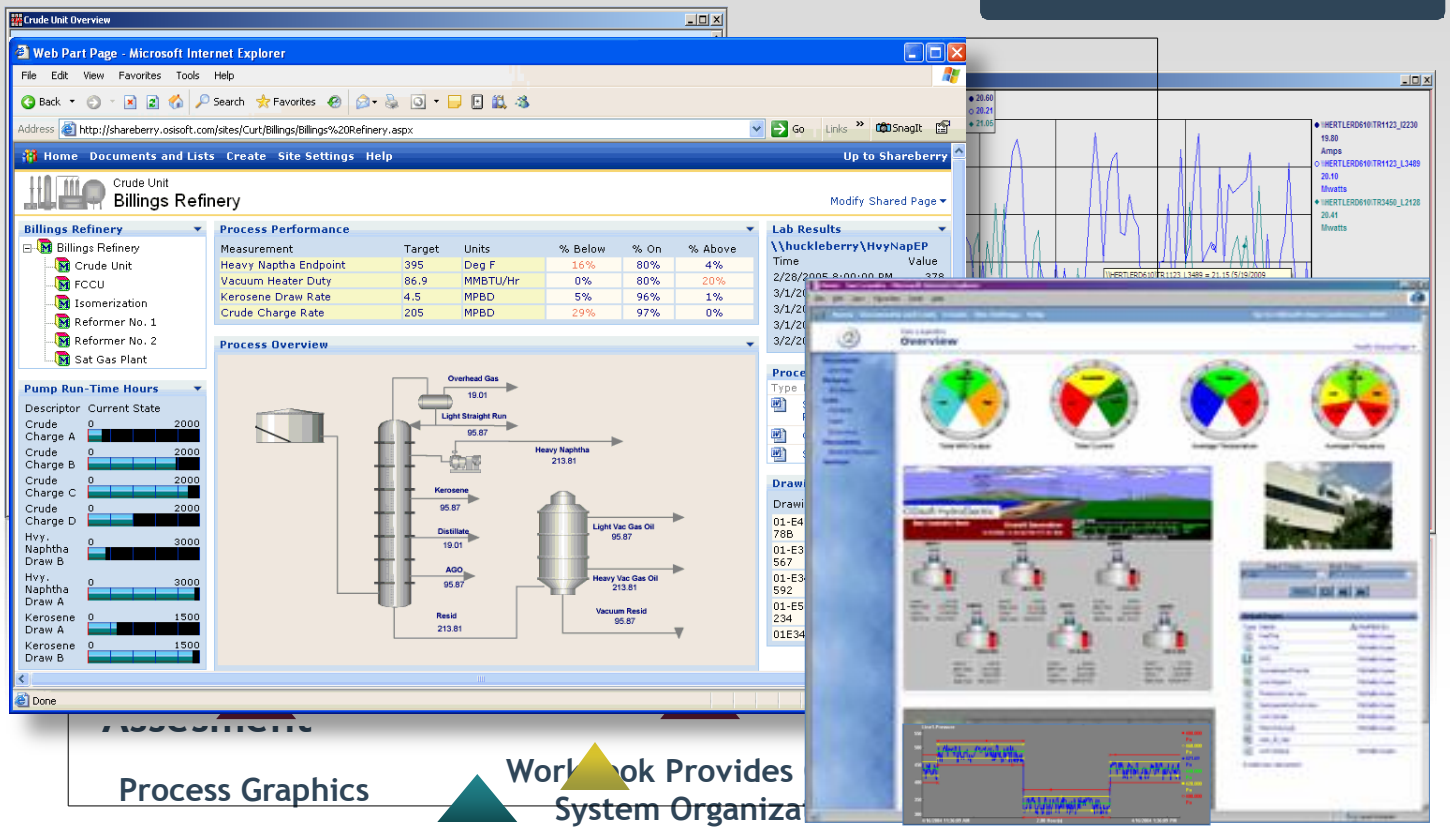
Gain a comprehensive view of operational information

Present

View data, identify problems, and take corrective action with familiar, easy-to-use graphical tools.

- ProcessBook®
- PI DataLink™
- DataLink for Excel Services
- PI BatchView
- PI WebParts™

PI WebParts™



Process Graphics

Work[illegible]ook Provides
System Organiza[illegible]

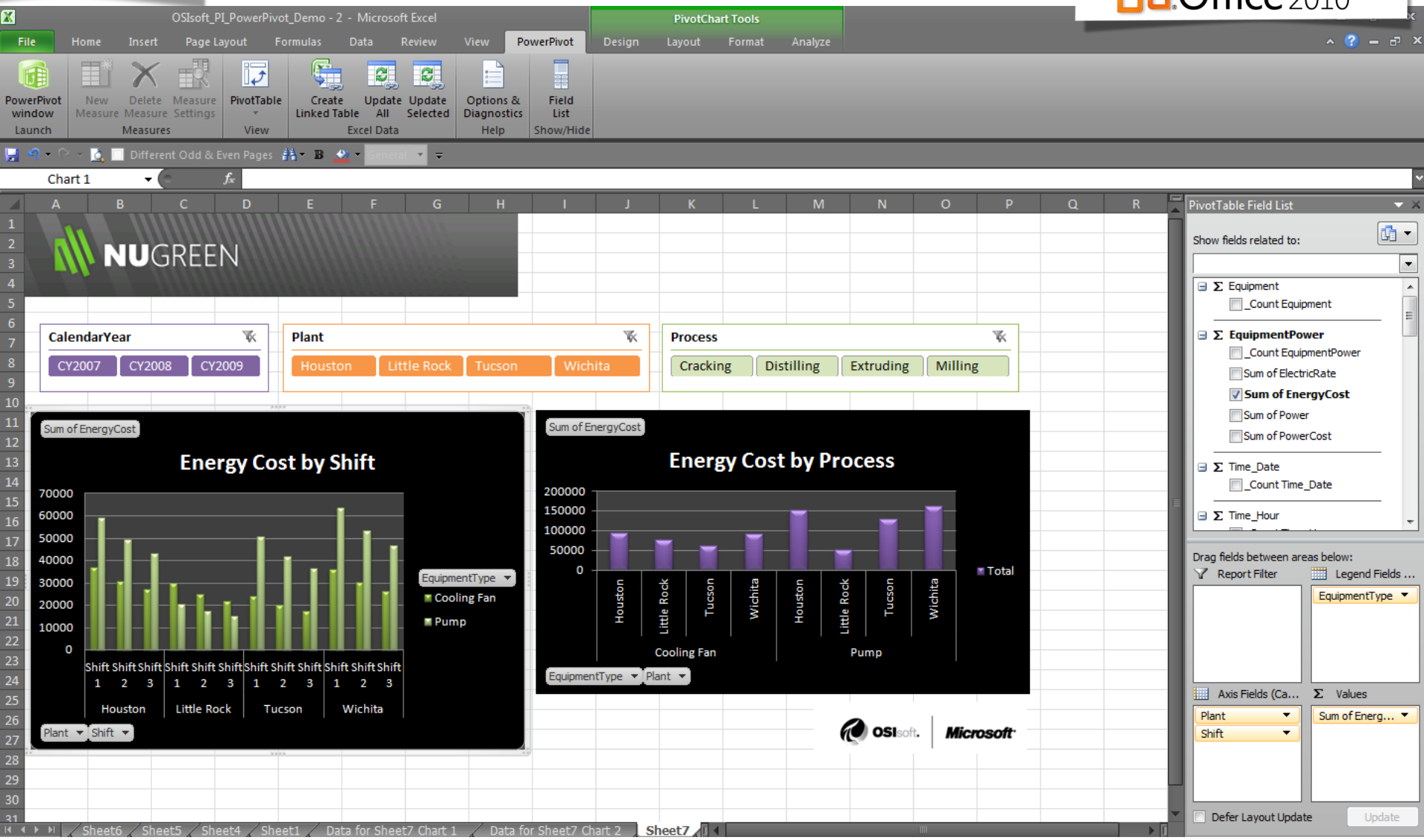
Provide[illegible] Access to real-time and historical process information anywhere

[illegible] information for analysis and reporting

Empowering Business in Real Time.

PI for Office 2010

PI and PowerPivot for Excel 2010



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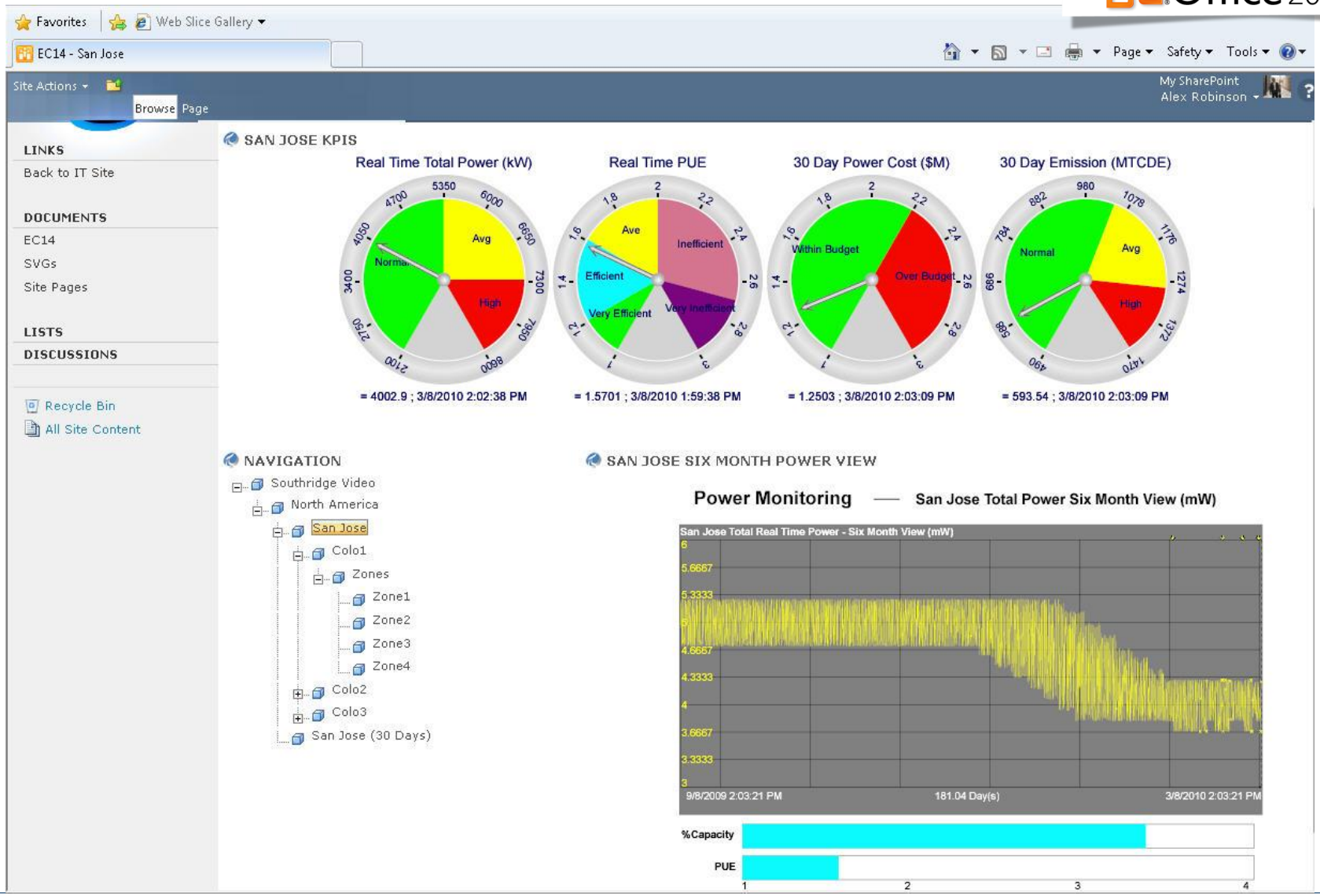
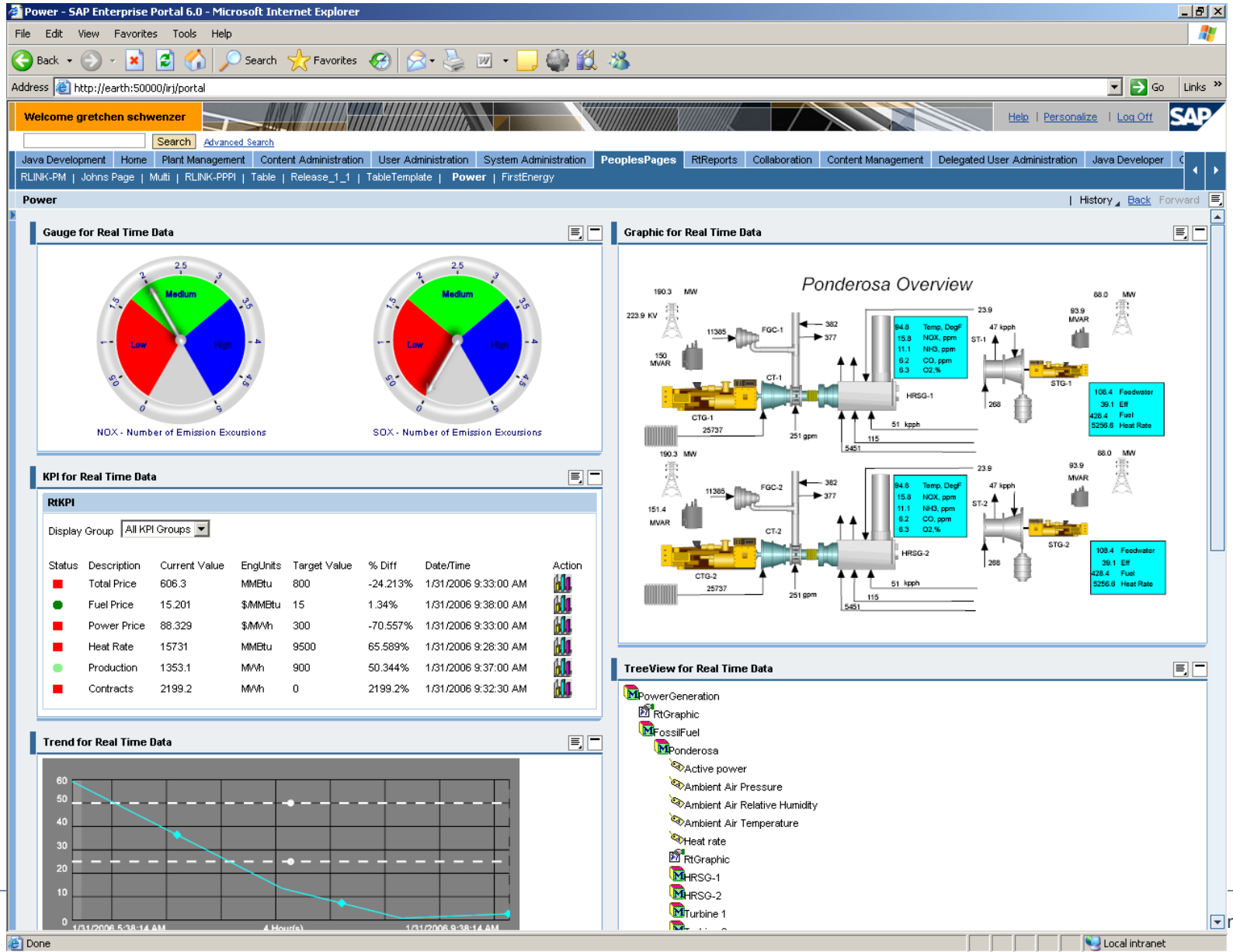
PI for Office 2010

PI Web Parts 2010 for SharePoint 2010



Empowering Business in Real Time.

RtBusiness Package



Thank you

777 Davis St., Suite 250 San Leandro, CA 94577