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Regional Seminar Series Johannesburg, South Africa

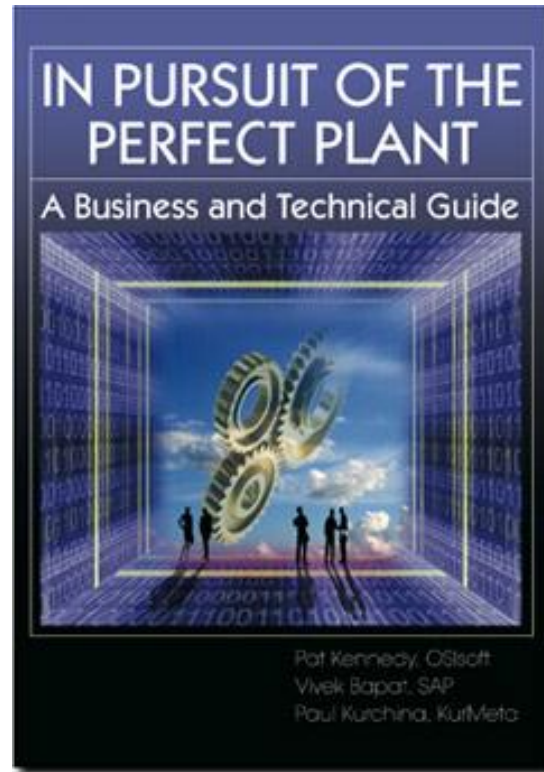


A Roadmap for Real-Time Plant Information Integration with SAP

Carol Jackson
Business Development
OSIsoft LLC.

February 24, 2011

- The “Manual” *In Pursuit of the Perfect Plant*
- Common System Integration Methods
- Product Positioning
- Architecture
- SAP/OSIsoft Co-Development Efforts
- Customer Examples
- Questions



See also:

www.perfectplantbook.com

To underline the OSI/SAP partnership, our CEO, Pat Kennedy, and SAP's Vivek Bapat co-authored the single most significant source of information that clearly explains how to manage real-time data and transform it into useful information for the ERP/SCM environment. Readers find this a good resource to learn the contribution of real-time data within the IT business system environment to accelerate decision-making and profitability.

- Custom programming using SAP BAPI's, RFC's or IDOC's
- RLINK (OSIsoft's custom SAP interface in the 1990's supporting PPPI, QM and PM)
- Custom Programming using available web services
 - Microsoft BizTalk's SAP Connectors
 - Web Services from SAP PI or NetWeaver
 - IBM's Websphere connectivity
- SAP's MII and PCo



Today's Focus

ASUG ANNUAL
CONFERENCE

Orange County Convention Center
Orlando, Florida | May 16-19, 2010

Tips and Tricks for Optimizing SAP MII, PCo, and OSIsoft PI

Michelle Kuiee, OSIsoft

Michael Appleby, SAP

Session: 1513



The
DIFFERENCE
Is YOU

What does OSIsoft's PI System do?



.....Real-time Information Infrastructure

Store Data



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

Analytics



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

Notify

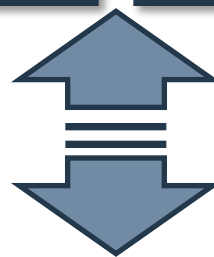


Deliver events to people anywhere from the plant to the boardroom.

Visualize



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

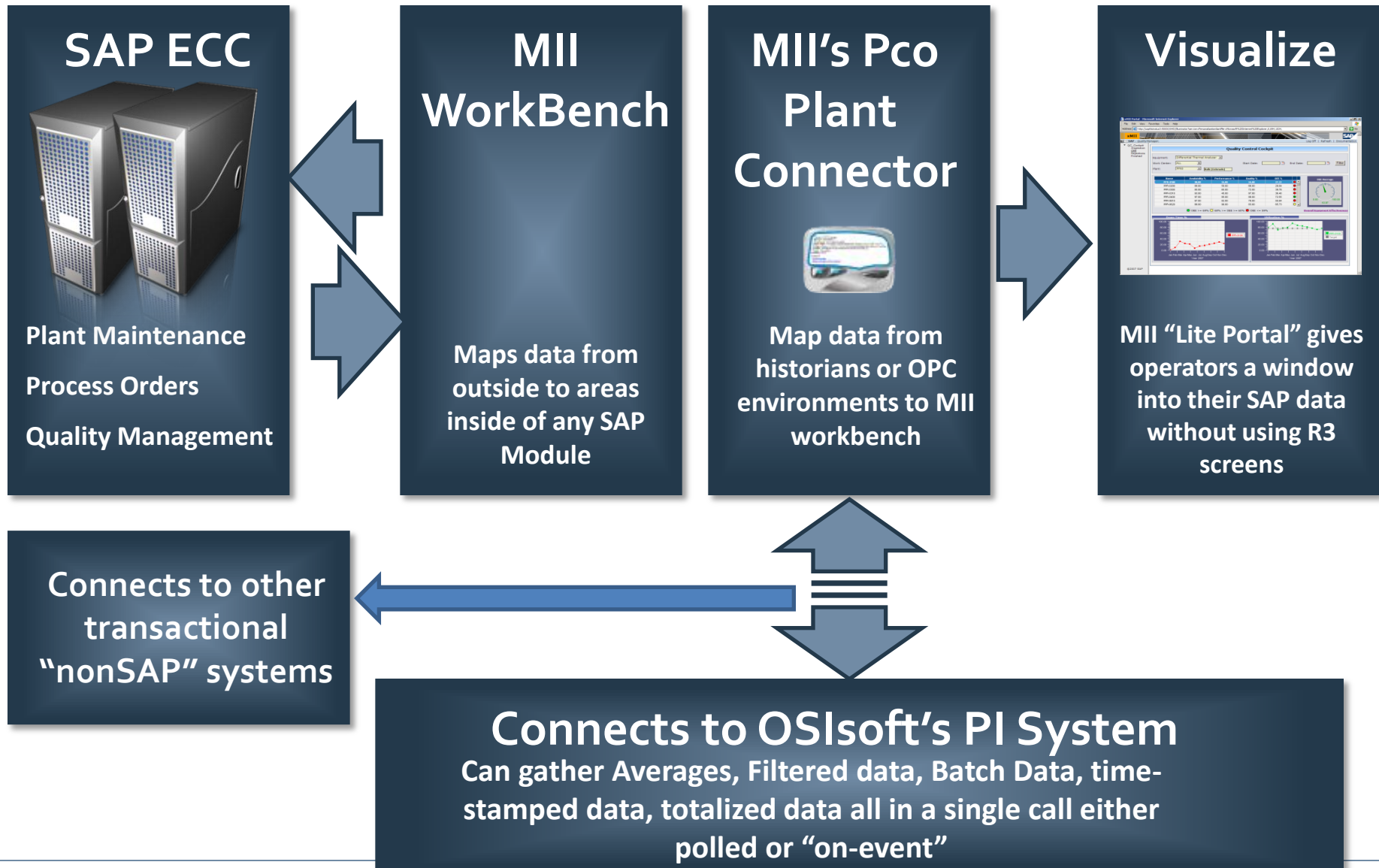


**Collect Real-time data with PI-Interfaces
(450+ different connectors)**

Collect millions of variables from hundreds of sources of continuous and Lab data

What does SAP's MII System do?

.....Smart Workbench for moving data in and out of SAP ECC.....

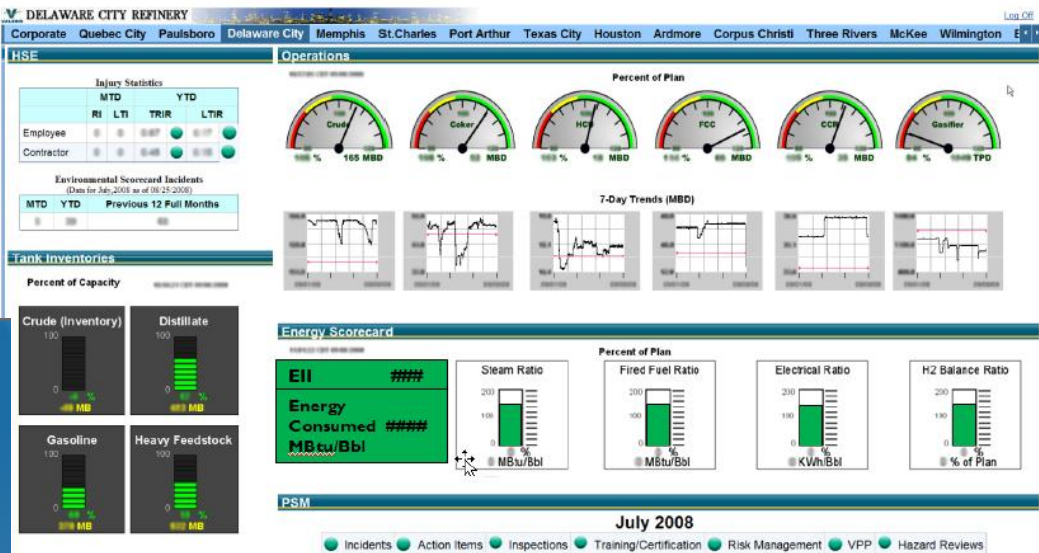


The PI System

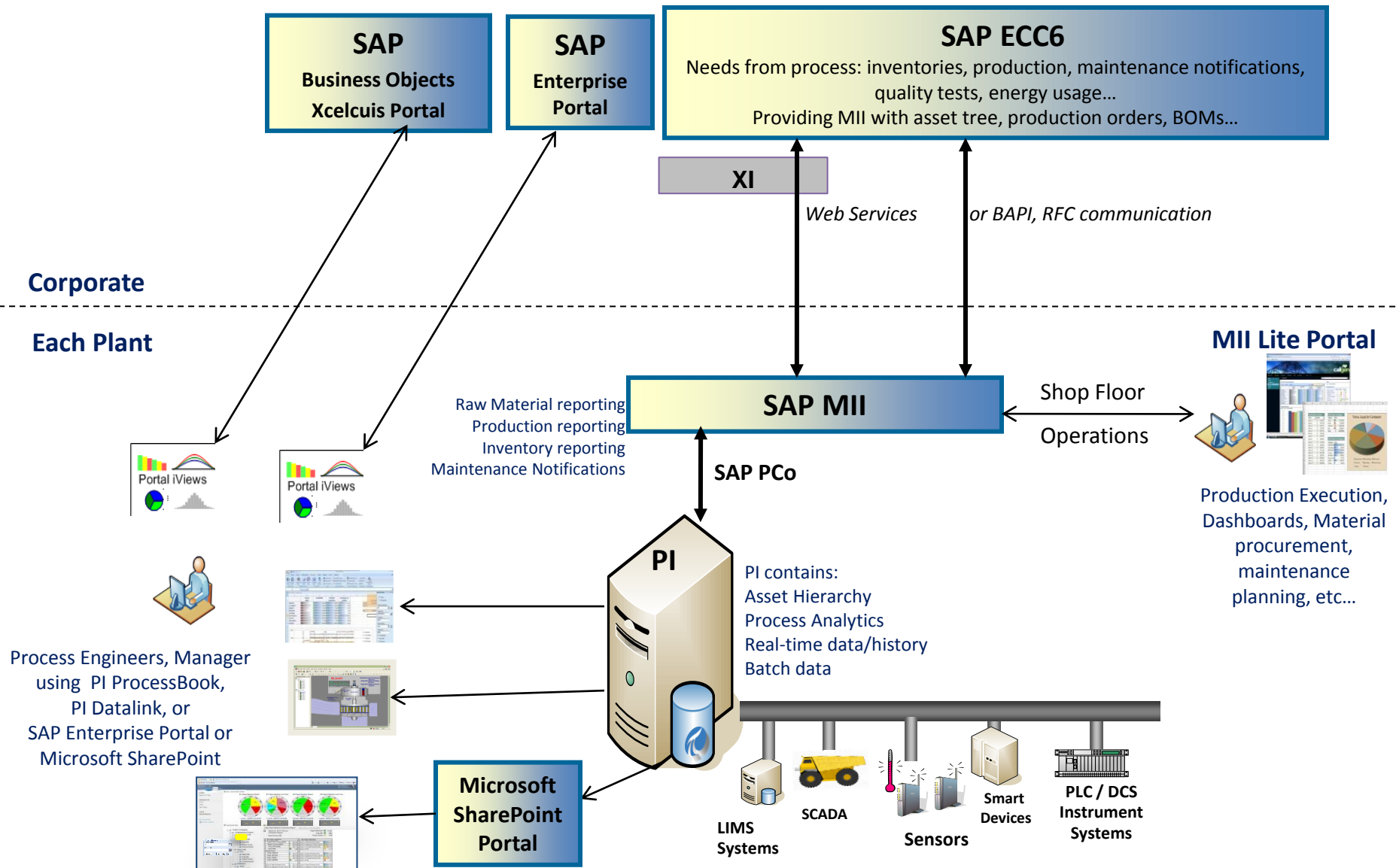
- Connects to all sources of continuous real-time data
 - Lab - InfinityQC
 - Rockwell RSVIEW
 - Environmental Systems
- Provides analytical tools for real-time data
- Provides summary data “on event” to MII
- PI data is also used by process engineers and managers for reporting and analyzing process upsets and problems

SAP MII

- Connects to a historian in a plant
- Connects to other non-SAP sources of transactional data
 - Transportation Systems
 - Time and Attendance
 - SAS, etc...
- Combines data and moves it into various SAP modules
- Moves SAP data out for Operators to use or for use in “other systems” connected

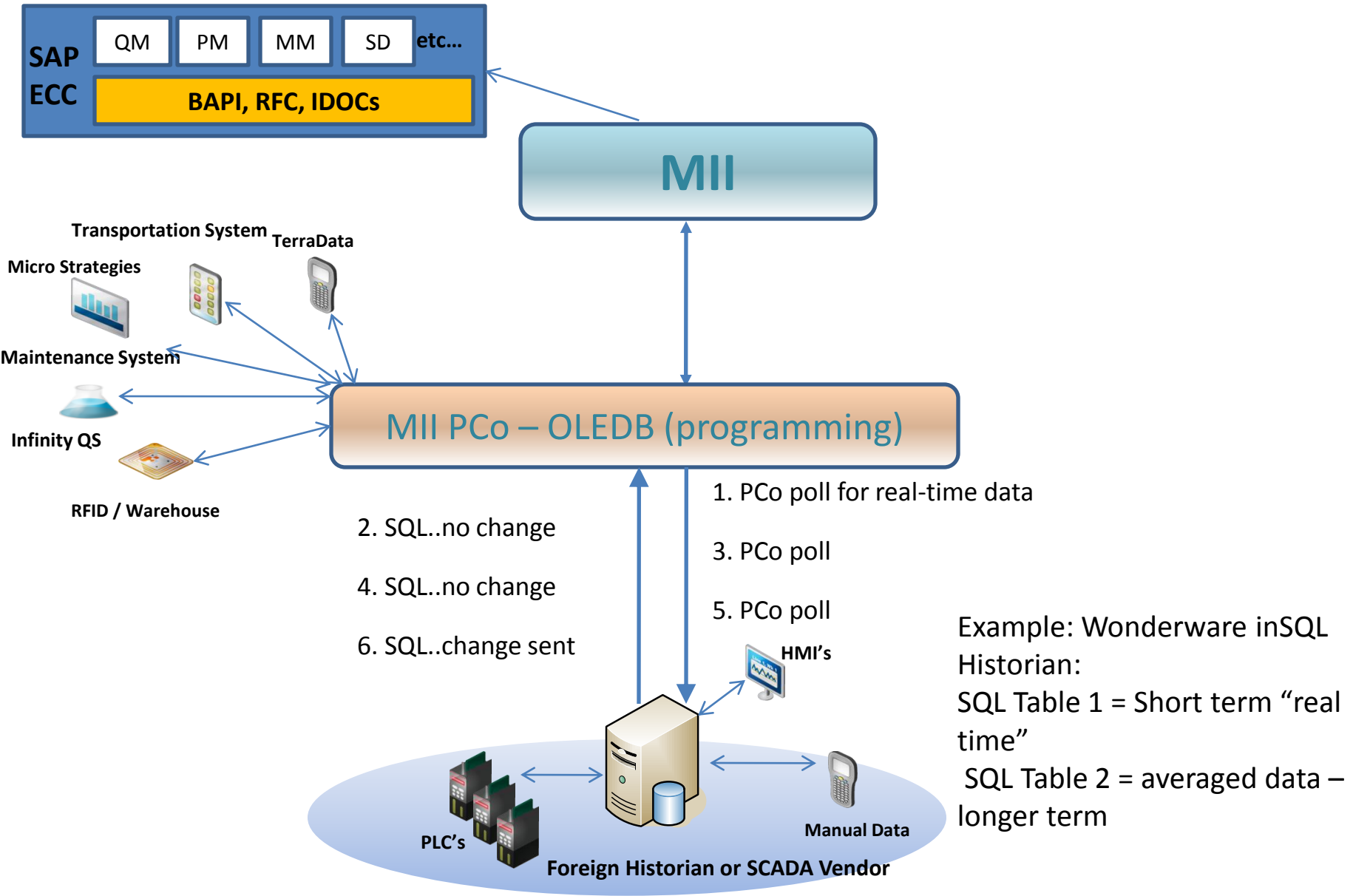


Plant Level PI/MII Architectural Diagram

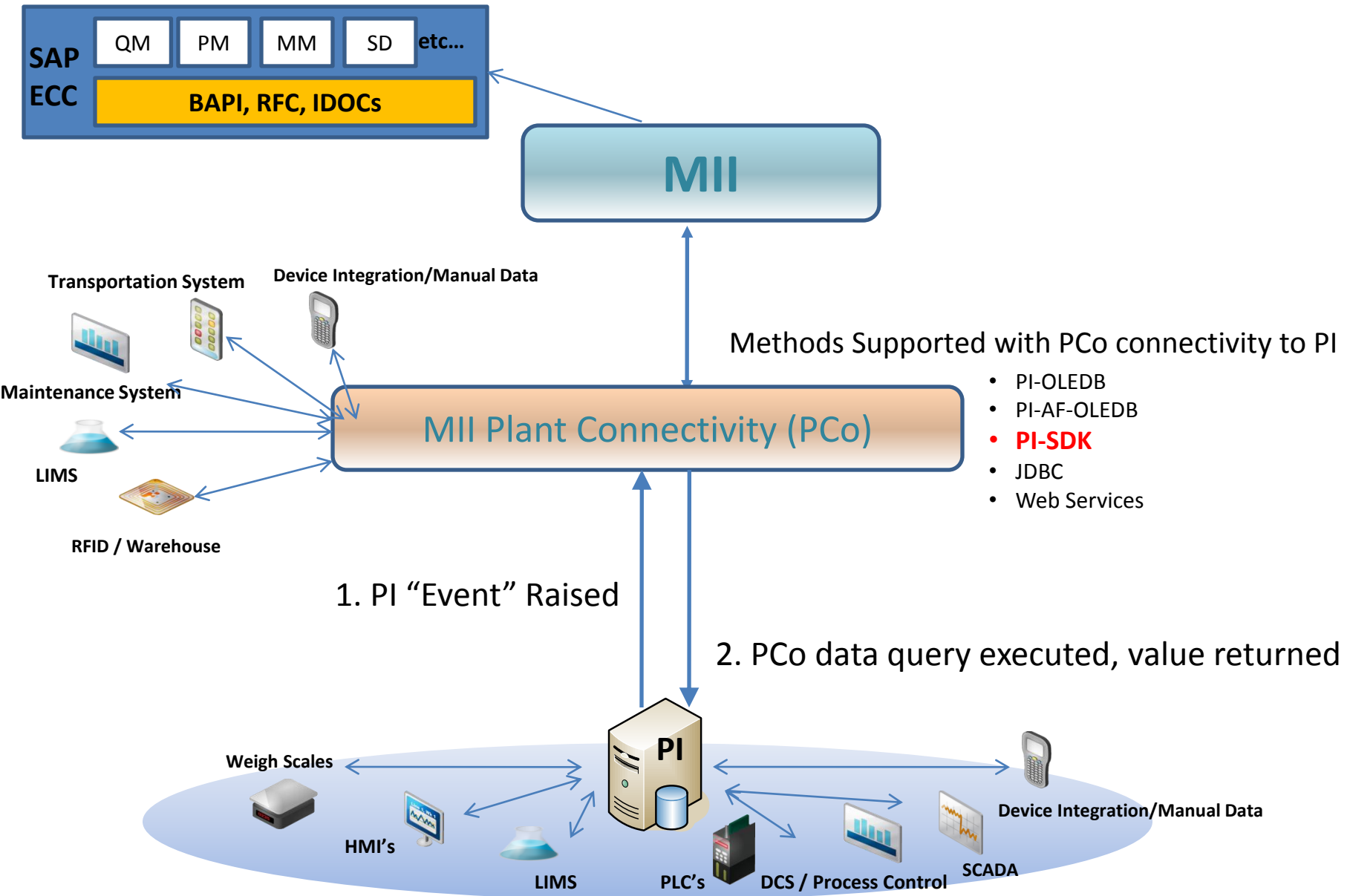


1. OSIsoft has been a certified business partner since 1994 (Beginning with RLINK)
2. OSIsoft and SAP announced their MDUS/AMI partnership for Utilities in Jan 2010
3. OSIsoft and SAP co-innovate at SAP COIL in Palo Alto - examples of SAP using MII and PI for their own energy management in their Palo Alto buildings
 - Sustainability using SAP's Carbon Impact
 - EAM for Energy Management
4. **For the PI System integration to SAP's MII:**
 - OSIsoft and SAP have worked together to co-develop connectivity enhancements from use with BAPI/RFC to MII UDS (old) and PCo (new) environments
 - Process Data seen in SAP's MII demos today come from SAP's own PI Systems
 - PI Systems provide ubiquitous access to all process data and reduces the need for lengthy and costly installations of MII alone
 - PI System data consumers (like MII) can access its unlimited, high-resolution real-time and historical data:
 - » As an SQL DB (because MII has no platform to store real-time data)
 - » PI provides a high performing, highly available, reliable, secure data store for MII
 - » PI System provides data assimilation across multiple plants, multiple historians and multiple time zones
 - MII supports connectivity to other enterprise applications (typically transactional systems) outside of just SAP such as:
 - » Inventory management systems, Transportation management systems, Time and attendance systems, Procurement Systems

MII Integration to a “non-PI Historian System”

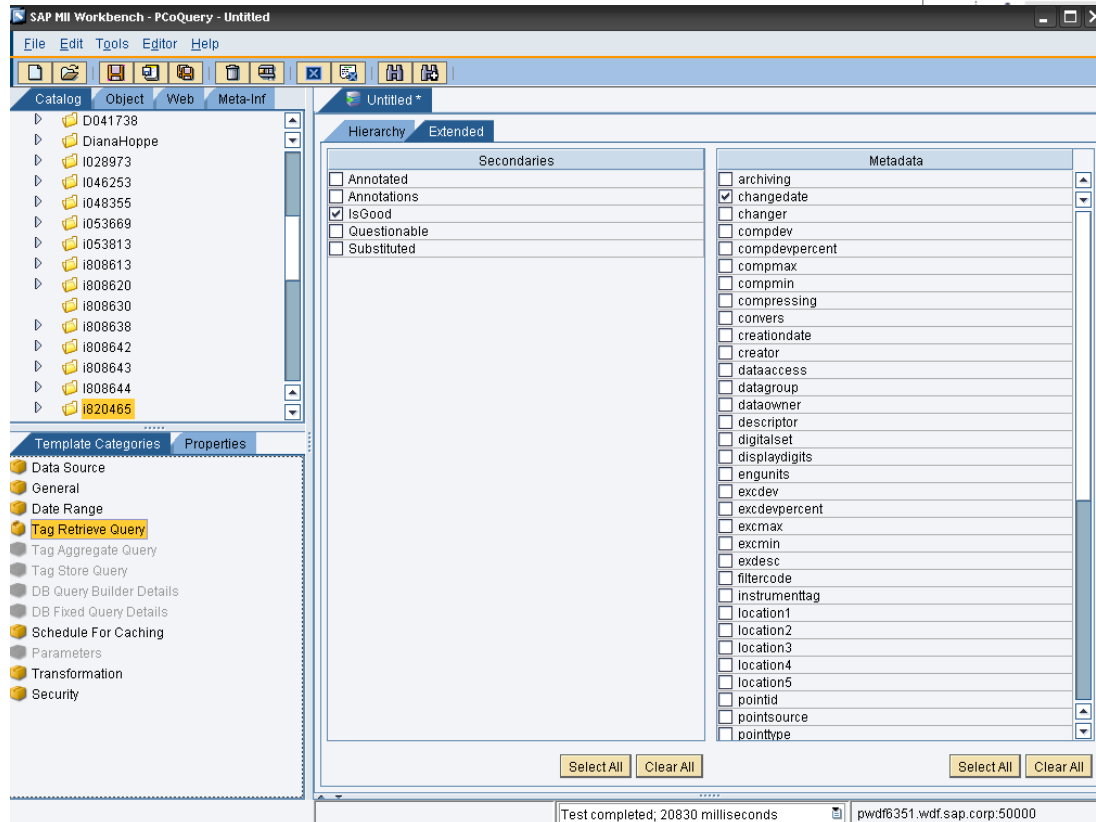
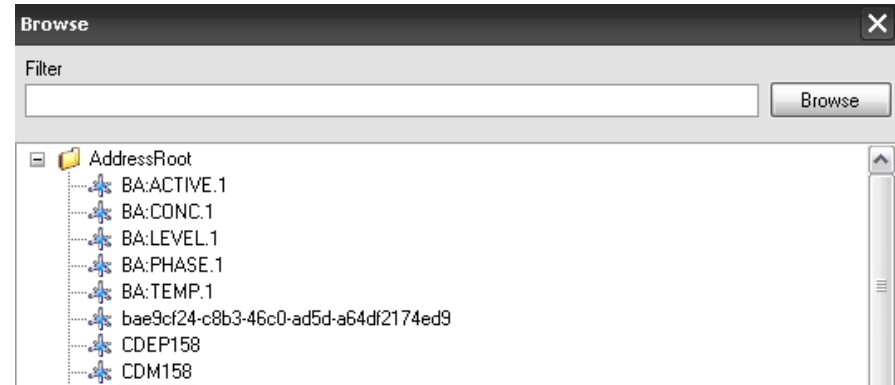


MII Integration to a PI System



How PI looks to the MII Plant Connector (PCo)

- Ability to Browse all PI tags or their Alias Name
- Select the attributes or tag properties desired
 - Like % good, Engineering Units....
- Save and link to a timed poll or event notification



Tables	
Table 1	
Name	IsStandard
Min	1
Max	1
Average	1
Sum	1
Count	1
TimeAverage	1
Integral	1
Range	1
Delta	1
StandardDeviation	1
StandardDeviationTW	0
PStandardDeviation	0
PStandardDeviationTW	0

- PI supports the new PCo “eventing” and has been tested to greatly reduce network traffic
 - If a lab test result in MII determines that a connected LIMS data point is “off quality” from TimeA until TimeB, MII can request a PCo query for all PI tags associated with the manufacturing equipment whose product produced the bad test result from TimeA to TimeB.
- PI supports many calculation methods for getting PI summary data in a single call back into MII
 - Other historians need to return an entire block of data back to MII so that MII can perform the needed calculation in MII and make sure the data had been collected continuously (no “holes”) over the time period. PI can return a calculation and whether or not all data was available for the calculation in a single return to MII - reducing network load by 100x
- PI supports the new “MII for Batch Manufacturing” and has been tested
 - A single PCo query can retrieve all summary data from a single batch thereby greatly reducing network traffic load
- PI supports tag aliasing so that PCo queries can be re-used against the PI system and just pointed to the different pieces of equipment - meta-data tables (mapping PI tags to their equipment name) do not have to be maintained in MII also.

- PI supports connectivity to over 500 disparate sources of process data with its standard interface suite
 - Low network traffic for retrieving source data - utilizes exception reporting
 - Supports failover of interface on network failure
 - Supports buffering and feed forward on re-connection if PI is ever disconnected
- PI is highly secure and highly “available” (ability to mirror servers)
- PI supports storing over 1 million different variables (tags) in a single historical archive file with fast access on line for years
- Information includes not only tag values, but also, digital states, string data, percent good, archive edit events, etc... all exposed by the SDK
- PI supports an Asset Hierarchy exposed to MII with tag aliasing that allows for easy tag identification and re-use of queries from PCo across similar assets
- PI supports batch processes by Framing the start and end of batch Events so that MII can access PI data across batches (not just time-based queries)
- PI can collect data from multiple time zones and render to MII in the time zone of record

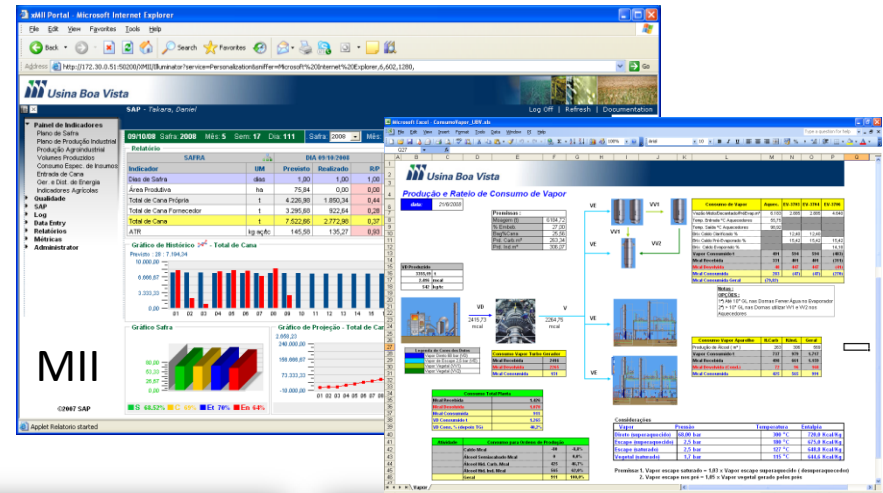
OSI and SAP

MII AND PI INTEGRATION

Grupo São Martinho: Vertical Integration between plant floor and SAP ERP

Grupo São Martinho is a company operating three sugar mills with alcohol production in Brazil. In their presentation, they explained the value achieved from connecting their PI System to SAP via MII at their Usina Boa Vista to provide complete supply chain visibility.

Presentation by Edinei Castro | Project Leader |
Seminário Regional da OSIsoft do Brasil 2008



Customer Business Challenge

- Operational Visibility in real-time across their entire supply chain from production planning through manufacturing and shipping
- Needed to eliminate manual entry errors in inventory accounting

Solution

- Implemented the PI System with connectivity to SAP via MII for presenting a real-time view of order planning and execution.
- Link their PI System process data to SAP business modules such as PP/PI and PM

Customer Results / Benefits

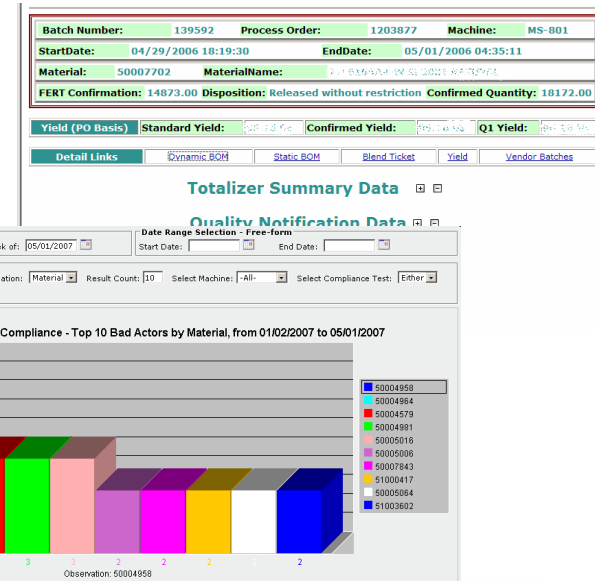
- Provided visibility needed for planning optimization and gave operations information in real-time
- The PI System gave plant personnel the ability to have a central data store for all plant data so that problems could be analyzed easily.
- Vastly accelerated the learning curve for plant operations for personnel

Celanese: Actionable Intelligence on the Plant Floor for superior plant performance

“The translation of operational parameters into financial parameters makes work more meaningful. But we only deliver actionable information...in other words, those few KPIs whose results a given individual can influence through good decision-making.”



Brenda Hightower, Celanese Corp.



Customer Business Challenge

- Key operational data dispersed across disconnected enterprise systems
- Lack of consistent KPIs across multiple plants produced inaccurate corporate goal accountability measurements
- Difficulty in meeting continuous process improvement goals

Solution

- Entered into an Enterprise Agreement with OSIsoft to provide complete infrastructure connectivity
- Implemented the PI System as process data infrastructure and historian with its powerful analytical engine.
- Implement connectivity from the PI System to SAP using MII.

Customer Results / Benefits

- Rolled out operations dashboards to include production performance and business metrics to drive decision making down to the plants.
- Achieved \$1.3MM in savings from the first installations at two sites. Currently installed in 10 sites, with rollout extending to 25 sites.

Dow Corning: Greater Accountability Drives Improved Manufacturing Performance

“With over 30 years collective experience with the OSIsoft PI System and SAP MII, our staff at Dow Corning considers these platforms as the primary foundation used to deliver operational excellence, empower innovation and drive customer & shareholder value. While both of these software platforms can stand on their own merit by delivering value to our company, their combined application is where step-change improvements are most easily achieved and sustained. Both the OSIsoft PI System and SAP MII platform are essential to our core information technology manufacturing infrastructure. Their combined usage provides us with a global reach in our enterprise infrastructure.”

Keith Carey
Global Manufacturing Operations Automation Manager
Dow Corning Corporation

DOW CORNING

Customer Business Challenge

- Needed productivity improvements to maintain margins
- Saw an opportunity to correlate real-time operational data and business outcomes
- Struggled communicating the business strategy at every level of the organization and maintaining alignment

Solution

- Implement the PI System as the an Enterprise Infrastructure for plant process information.
- Implement connectivity from SAP ERP using MII to radically simplify business processes delivered to the front line operator
- Used MII as a conduit from the PI System to support EAM initiatives

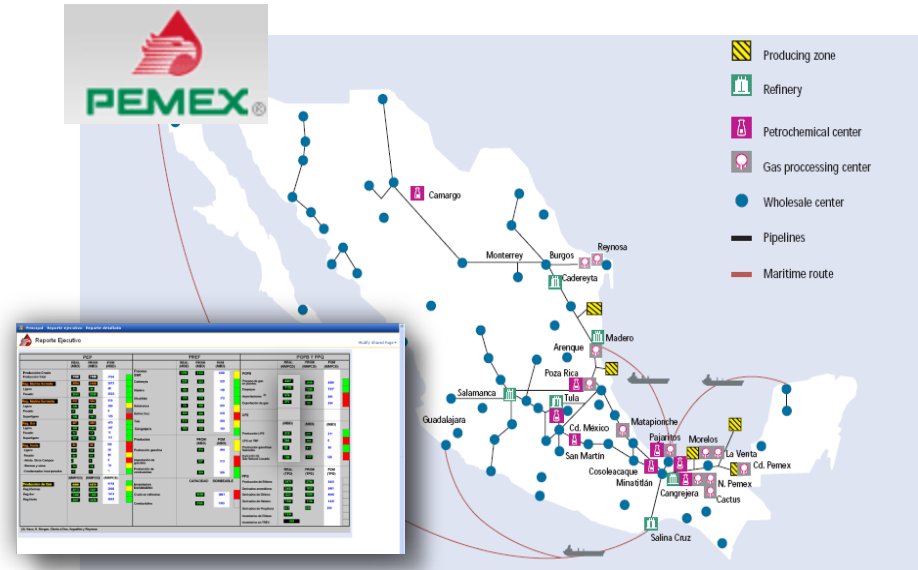
Customer Results / Benefits

- Provided Global solutions that leverage common infrastructure and technology
- MII and the PI System provided a collaborative environment to leverage Business Intelligence capabilities empowering businesses to create their own actionable views of information across the enterprise

PEMEX: Operational Excellence through Supply Chain Management

“We needed to implement software to analyze information and make decisions in the right way... Now our decisions are focused on the future, not on the past.”

Manuel Chavez Director, Operational Control, Pemex Gas



Customer Business Challenge

- Need to develop an Operating Coordination Center to support logistics.
- Need to coordinate events in case of out of normal operations.
- Need to act as quick response center in security affairs.

Solution

- A highly available solution required
- Implemented the PI System as process data infrastructure and historian with a powerful analytical engine.
- Implemented SAP's MII application

Customer Results / Benefits

- Highly available and secure solution to meet the needs of the user community
- The PI System and SAP MII were installed enterprise-wide to achieve logistics objectives

Altivity: Production Reporting

“When Altivity Packaging designed their corporate production reporting application for their bag facilities, we selected OSIsoft’s PI System and SAP’s MII application. Together, these applications give our users a single view of information in an easy- to-use software framework..”



Rod Jackson, Senior Director, IT Integration and Distributed



Customer Business Challenge

- Need uniform reporting and display environment to monitor production.
- Require data in real-time for better decision making

Solution

- Implemented the PI System as data historian and analytical engine.
- SAP’s MII is the user interface and reporting and display tool.

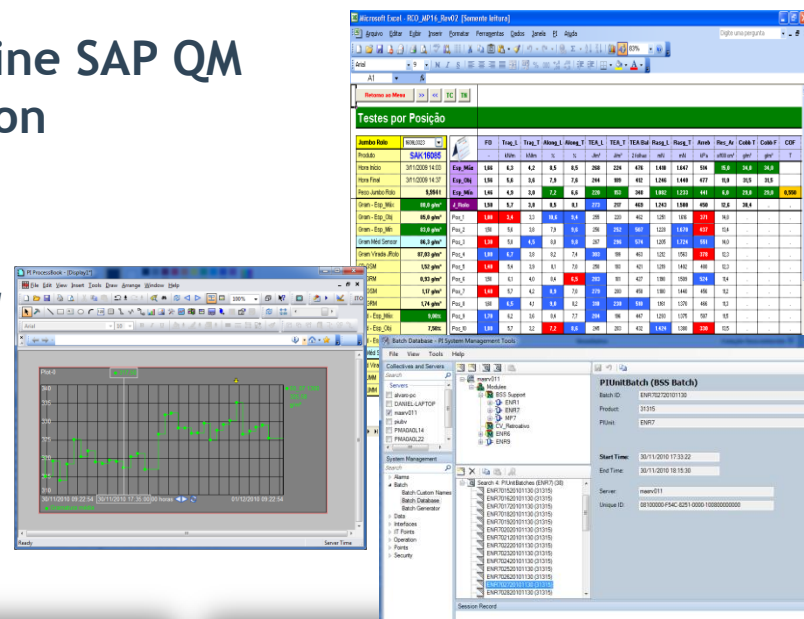
Customer Results / Benefits

- Have accurate Production reporting environment viewable by all to have consistent set of results.
- Calculations available in real-time
- Reporting available on 9 sites located in three time zones.

Klabin: Using OSIsoft PI and SAP MII to streamline SAP QM integration of paper machine quality information

“Using the PI System software reduces manufacturing costs and increases productivity around managing all aspects of pulp quality and process troubleshooting.”

Francisco A Fernandes
Manager of IT



Customer Business Challenge

- Had many sources of data, no central point of integration
- Needed to Improve quality and minimize scrap
- Needed to standardize processes across plants to scale up best practices
- Required streamline integration to SAP

Solution

- Implemented PI as the data collection from DCS, QCS and lab systems for information feed up to SAP
- Rewrote all custom processes from the SAP manufacturing integration to MII application
- Automated and consolidated reporting

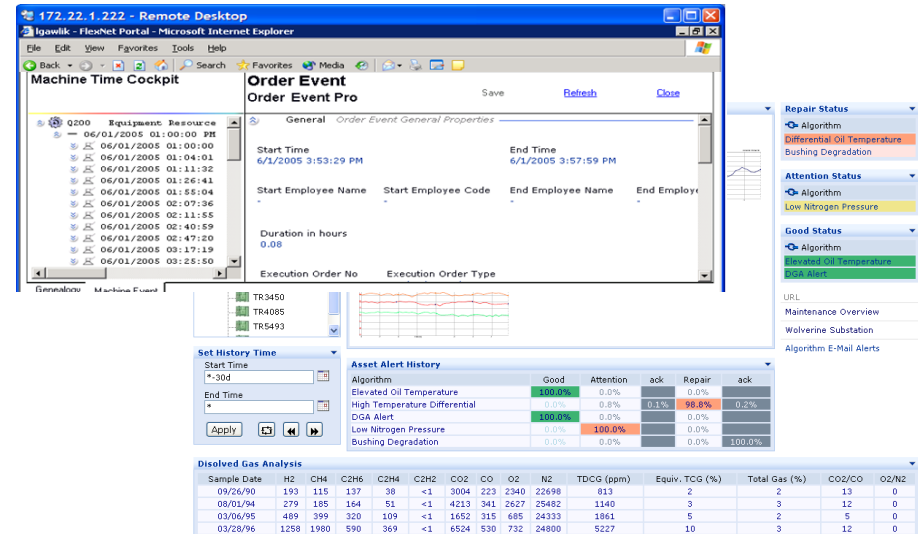
Customer Results / Benefits

- Saved millions of dollars annually
- Reduced scrap by 700 tons in the first plant alone - \$500,000 USD per year
- Maximized asset utilization by increasing overall equipment effectiveness by 60% - 70%
- Raised plant personnel productivity by 8%

RTI International Titanium Metals: Achieving Operational Excellence

“PI and MII have helped streamline our shop floor visibility of OEE initiative resulting in greater shop floor efficiencies.”

Tony Malangone, CIO



Customer Business Challenge

- Create baseline reporting tool to measure Overall Equipment Effectiveness (OEE).
- Provide an online production order dashboard, allowing real time production status information to be processed into SAP ECC 6.0, increasing financial visibility information.
- Needed to enhance baseline reporting capability on sales/production order status, WIP and work center capacity detail

Solution

- Implemented the PI System as data historian and analytical engine.
- Implement SAP's MII is the user interface for shop floor integration with SAP and for use by operators.

Customer Results / Benefits

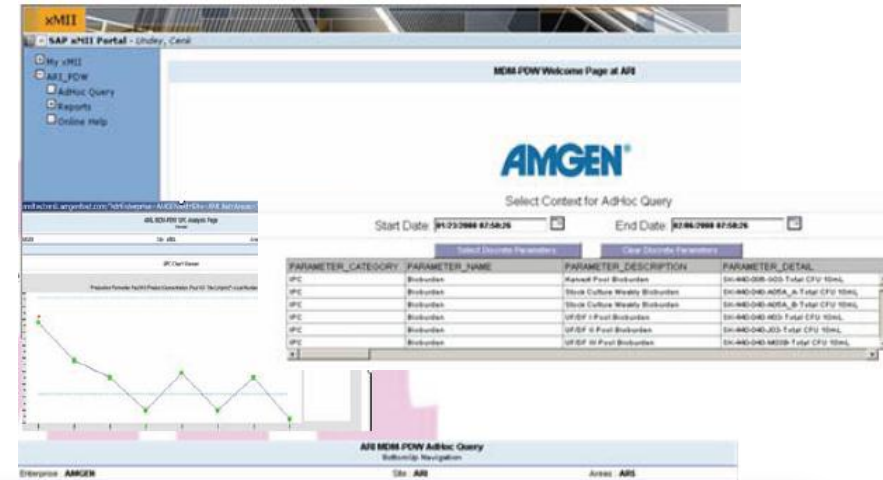
- Improved accuracy/timing of production order confirmations
- Achieved visibility of Overall Equipment Effectiveness (OEE) for critical machines
- Minimized manual process where enabled.

Amgen: Paving the Road to Plant Data Integration

“ We wanted to establish an architecture that enabled future incremental development ”

From Amgen's 9/15/08 SAP ASUG Operations presentation

Robert Gamber. Principal Engineer, Platform Lead



Customer Business Challenge

- Expedite the Commercialization Process by reducing engineering and conformance runs required
- Improve Operational Effectiveness through Increased ROA yields and success rates
- Increase Quality by identifying root cause to build quality into the process
- Deliver business and operational information better, faster, cheaper → The Perfect Plant

Solution

- Implemented the PI System as data historian and analytical engine.
- Used SAP's MII as the user interface and reporting and display tool for operators to interact with business data and product schedules
- Leveraged data in existing source systems to reduce risks associated with data replication - 85% of MII data came directly from Amgens plant PI Systems

Customer Results / Benefits

- Able to provide operations with a “validated” single window of truth
- Provided a standard, repeatable manufacturing process characterization, monitoring and optimization by:
 - Optimize Process Improvements
 - Troubleshoot Process Issues
 - Resolve Non-conformance
 - Monitor in-process Control
 - Troubleshoot operational issues

Questions?



Thank you

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