

#### Regional Seminar Series Atlanta



# Integration of Shop Floor to Top Floor: A Roadmap for Business System Information Integration in Real-time

Rod Jackson, Sr. Director, IT Integration and Distributed Systems, Graphic Packaging International Carol Jackson, Enterprise Sales, OSIsoft, LLC.

October 22, 2009

#### Overview



This presentation from Rod Jackson, Sr. Director, IT Integration and Distributed Systems at Graphic Packaging, and Carol Jackson, OSIsoft, will examine the vision of one paper and packaging company as they began their initial journey of connecting the plant floor environment to their manufacturing execution systems while in the process of being acquired by Graphic Packaging. Later, this project would become the framework for a larger initiative for plant connectivity to SAP.





#### Regional Seminar Series - Atlanta, GA





Integration of Shop Floor to Top Floor:
A Roadmap for Business System Information
Integration in Real-time

Rod Jackson, Sr. Director, IT Integration and Distributed Systems, Graphic Packaging International

Carol Jackson, Enterprise Sales, OSIsoft, LLC.

Date: October 22, 2009

#### **General Company Overview**



Based in Marietta, GA, Graphic Packaging International, Inc. (GPI) is a \$4.5B integrated global supplier of beverage packaging, consumer folding cartons, bags, labels, flexible and specialty packaging, as well as a range of paperboard grades, high performance packaging machinery, and services.

#### Beverage Packaging

- Soft Drinks
- Beer

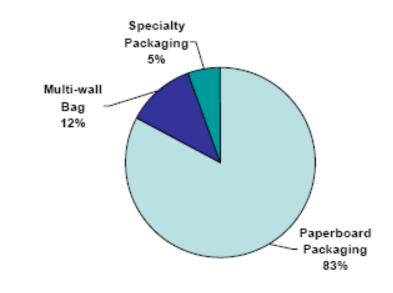
#### Consumer Packaging

- · Cereal & Dry Food
- Refrigerated Frozen Foods
- · Facial Tissue
- · Health & Beauty Care
- Gift Boxes

#### Flexible and Specialty Packaging

- Bags
  - Multiwall Bags (with PI)
  - · Consumer Bags
  - · Specialty Bags
- Labels
  - Heat Transfer and Litho
- Flexible Plastic Packaging (with PI)

# 2008 Revenue by End Market





## GPI Company and Manufacturing Challenges





#### Merger and Integration

- GPI worked diligently to integrate legacy Altivity Packaging facilities following the 2007 merger.
- Primary Objective is to achieve merger synergy savings committed to the shareholders.
  - IT Integration, Infrastructure and Applications
  - Divestitures and plant rationalizations
  - Business consolidations
  - Culture changes
- GPI's SAP business solution adopted to replace Altivity legacy applications in Consumer Packaging Division.
- Deployed teams to identify opportunities and deploy measures to drive down manufacturing costs. (Continuous Improvement, Lean, Six Sigma, etc.)

## Company Overview - Bag Division





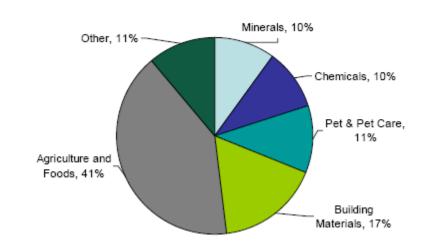
GPI is the largest producer of multi-walled bags in the U.S.

#### 9 Multiwall Bag Locations

- Arcadia, LA
- Eastman, GA
- Fowler, IN
- Jacksonville, AR
- Kansas City, MO
- Louisville, KY
- New Philadelphia, OH
- Salt Lake City, UT
- Wellsburg, WV



Multi-Wall & Specialty Bag End Markets



# Altivity Bag Plant - Business Case





# Project began as an Altivity Packaging initiative - prior to DOJ merger approval

- Limitations on information sharing between companies
- Multiwall Bag Group was considering a standalone .NET application and already committed to their PI System installation
- GPI was a SAP shop, but interested in replacing their current non-SAP shop floor system

# Multiwall Bag Group given company directives on throughput increases, downtime reduction, and waste reduction

- Bag plants were collecting production information on manual machine log sheets
- Each plant using independently-developed Access databases as system of record for production data - no enterprise view
- Management unable to timely and effectively track key metrics governing company directives for cost reduction

## Overview of the Project for the Bag Plants



#### **Evaluation / Selection Criteria**



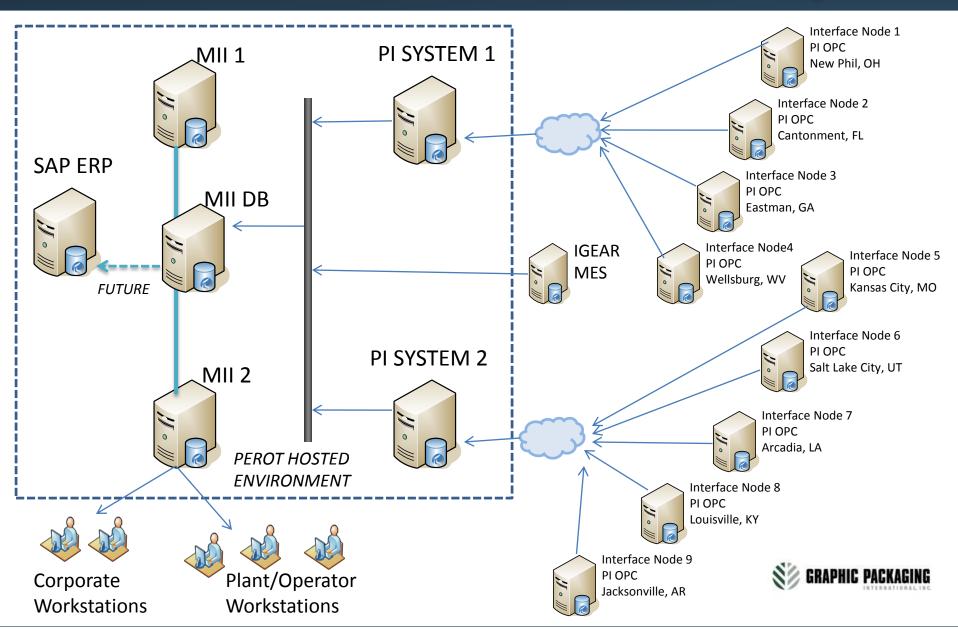
- Requirements analysis completed
- Goal: to provide management with more timely and accurate machine-integrated data
- Dilemma: How to get machine data from "mature" equipment?
- Output requirements:
  - Standardized reporting metrics by machine, shift, operator, and supervisor
  - Centralized dashboards and reports
- Future Requirement: complete integration synergy with SAP ERP

#### **Implementation Process**

- Original timeline was very aggressive (7 month timeline, which took 8 months)
- Tremendous amount of hardware required for shop floor implementations
- Centralized servers, plant wiring, PCs, PLCs
- Selected appropriate SI to assist in the project outline and intake forms
- Created a Project Team
- Implementation team originally composed of Perot (SI), SAP, and GPI resources
- Worked very closely with OSIsoft on installing and configuring their PI Historian
- Contracted with I/Gear (MES Vendor) for their DTU software

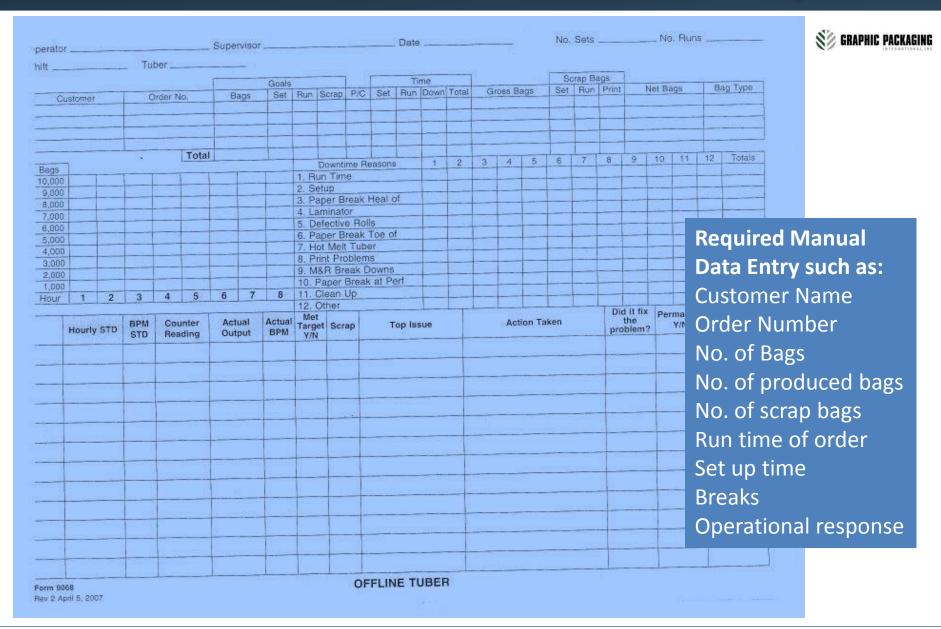
## Hardware Architecture Implementation





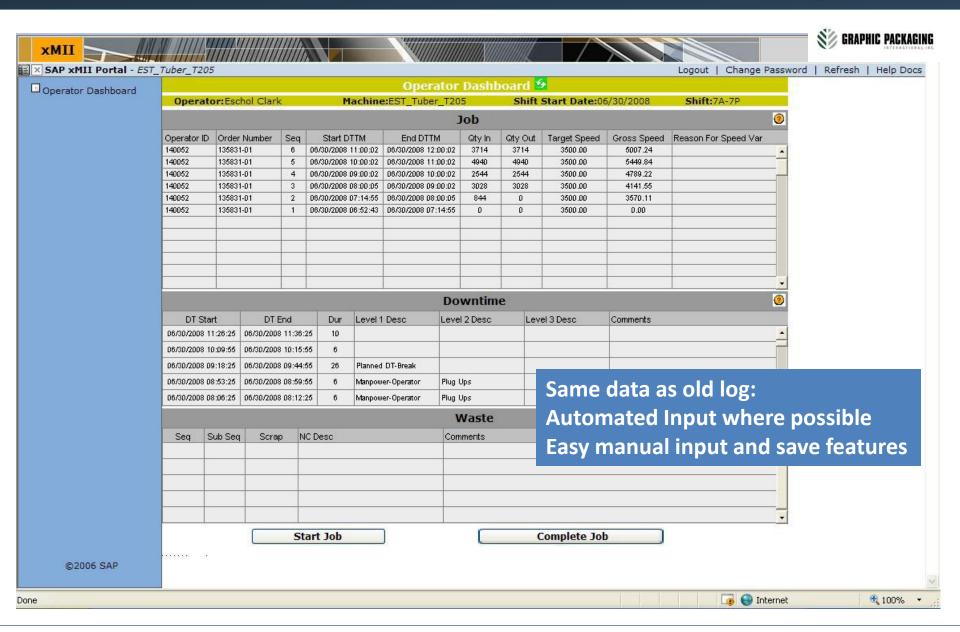
## Original Bag Plant Operator Production Log





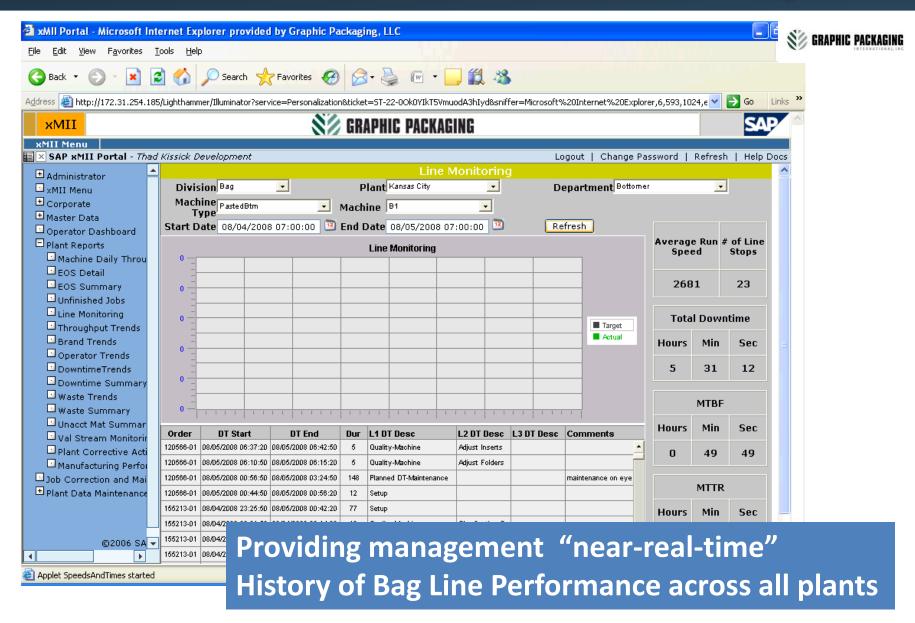
# New MII Operator Log





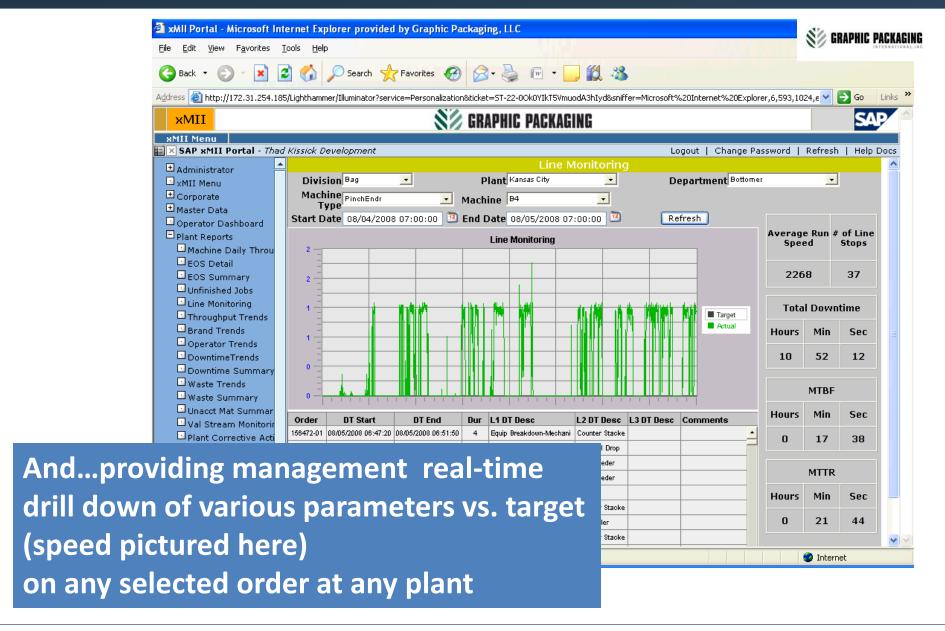
#### Additionally, more information for corporate





# Adding analytical capabilities and troubleshooting





# GPI's Bag Division: Tangible Benefits





# 1. Decreased manual entry error by removing dual entry of production information and a savings in labor

- · Plants now have a tool to empirically rate their operators and supervisors.
- MII manual entry data is now being used in quarterly employee performance reviews
- Visibility of production order information combined with real-time information from PI has increased.
- 2. Increased awareness and accuracy in measuring bag line performance against specific orders.
  - Remote division management is using the information on a daily basis to assess plant performance around certain orders
  - The corporate planning group has begun accessing the information in MII as a more timely and accurate method of retrieving information.
- 3. Maintenance crews' are now assigned with more efficient Preventative Maintenance based on down time metrics.

#### GPI's Future Direction, Vision and Plans





- 1. Apply key learning's and leverage model for project to replace legacy shop floor system throughout GPI's folding carton facilities.
- 2. SAP will be ERP solution for core converting business.
- 3. Pl as our Data Historian.
- 4. MII as an integration and dashboard tool.

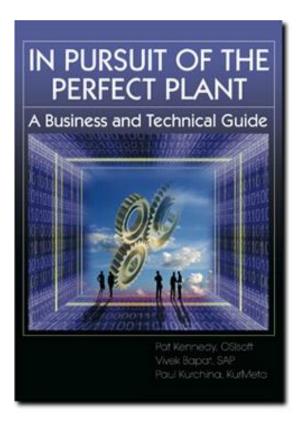


# General Advantage of Connecting "Shop Floor to Top Floor"

Closing Notes by OSIsoft

#### In Pursuit of the Perfect Plant



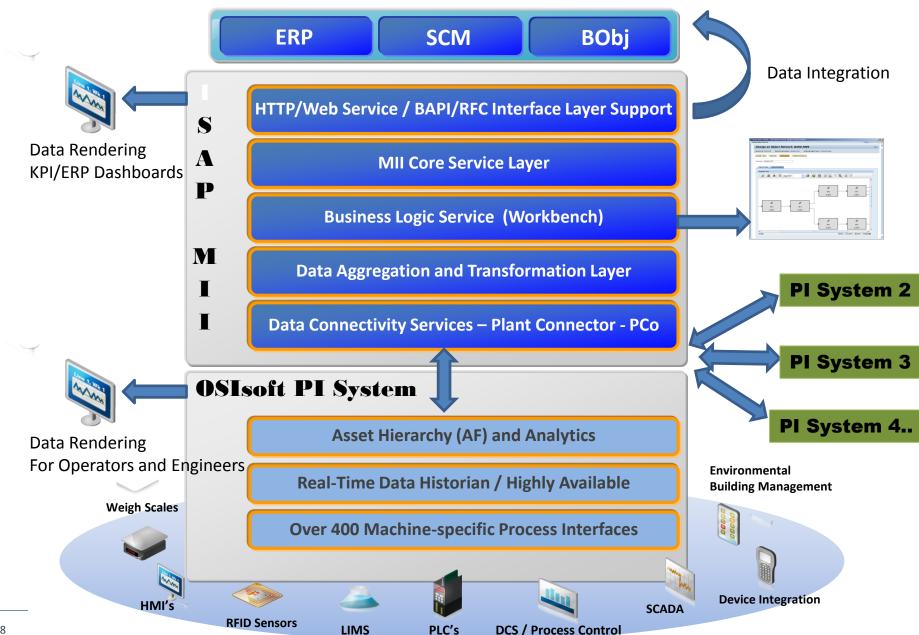


See also: www.perfectplantbook.com

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 what to do with real-time data in an ERP/SCM environment. Readers find this a good resource to learn what real-time data can contribute to the IT business system environment while accelerating decision-making and profitability.

#### "Better Together" - the basics of PI and SAP integration

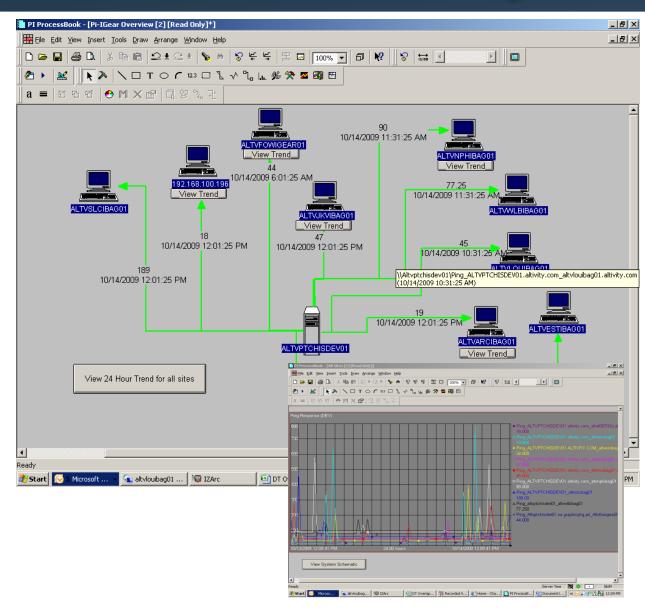




#### GPI using PI to monitor this diverse system Integration



- 9 bag plants
- Different time zones
- Monitoring network activity
- Managed from a single desktop
- Data critical for production reporting



# Superior functionality with PI: Processing Data

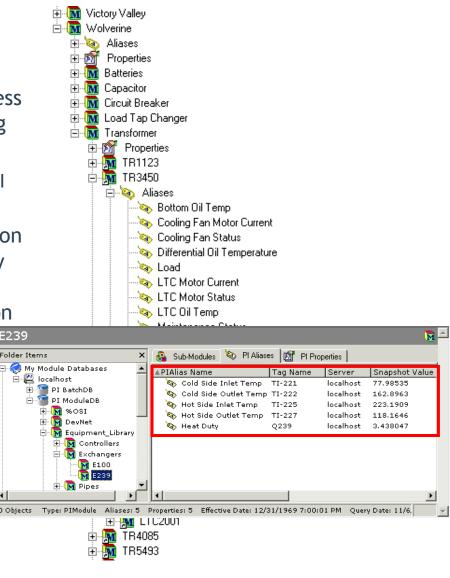


# Preparing Plant data for business process integration

- PI Analytics is the optimum place to pre-process data eliminating huge network loads (reducing message throughput)
  - Applies to uses of PI data sent to SAP MII, SAP XI and also Tibco, BizTalk or WebSphere
- Efficient access to PI Analytics provide precision data to aid work flows, scheduled tasks or any time critical or mission critical transactional process needs of business system(s) integration
- Calcs in PI can be scheduled or "on event"

#### How it's done:

- PI SDK filtered summary calls
- PI OLEDB expressions
- Resultants of PIAverages, PITotals, etc...
- Resultants of ACE Calculations (multiple calculations using tag aliasing associated with plant assets



#### Superior functionality with PI: the User experience UX

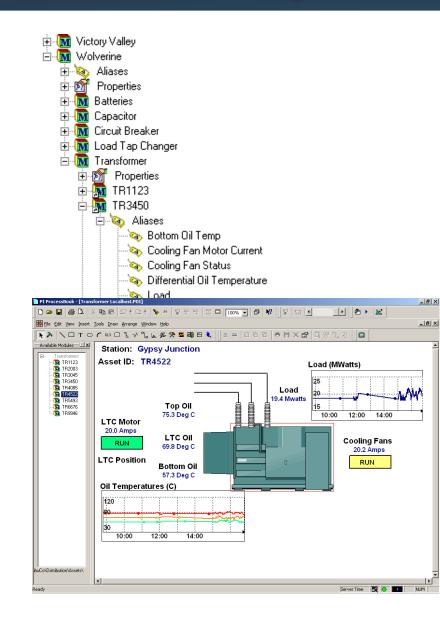


#### PI UX

- Thick and smart clients for same view
- With ad-hoc analysis and drill down capability

#### MII UX

- Simplifies SAP business process delivery to the front-line operator
- Lets operator adjust process order execution to meet process demand changes
- Seamlessly Integrates shop floor information with the enterprise systems allowing operators to enter data needed by SAP that previously required navigation among many screens to accomplish a single piece of data entry.
- And for many sites, MII extends the use of SAP to become the plant "MES"

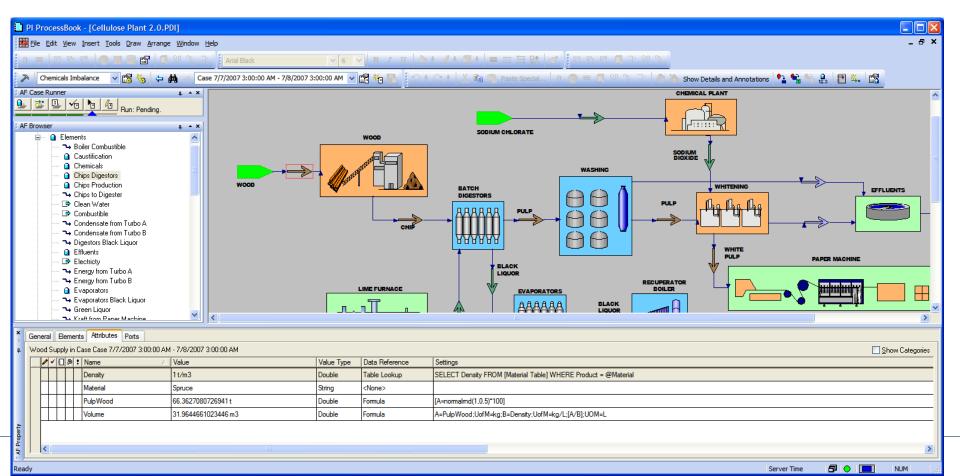


## PI offers strength of integration to Business Systems



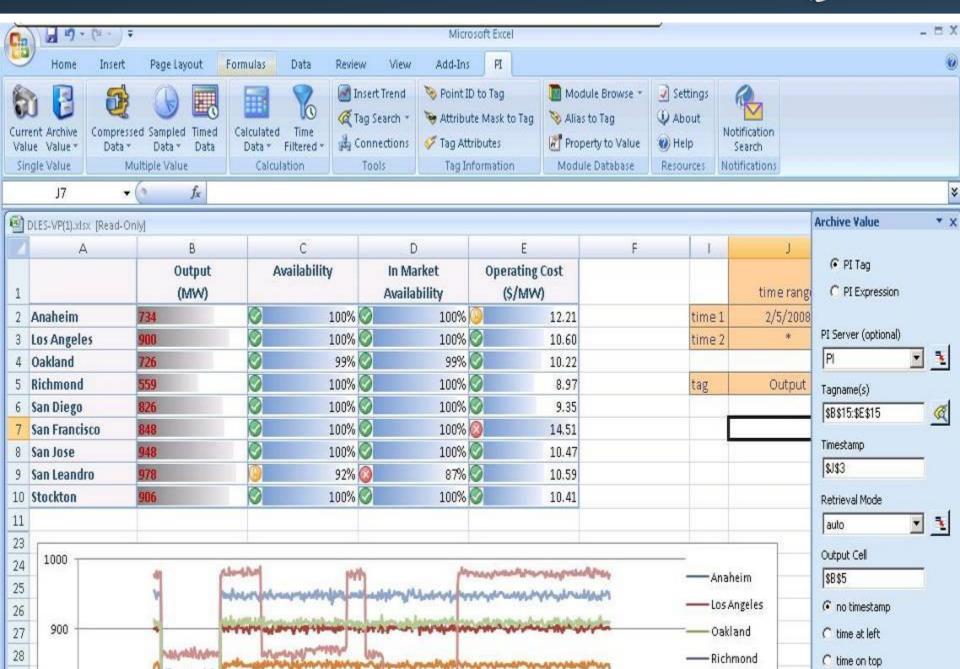
- 400+ custom interfaces
  - Node failover
  - Exception reporting
- Stores 250K events/sec
- Support for high availability

- Multi-million point systems
  - Compression without data loss
  - Internal analytics
  - Asset Hierarchy for data organization
  - Tag name Aliasing



#### PI Usage in the Plant Environment





# SAP and OSIsoft: Partnership Advantage Summary



- 1. PI Systems provide ubiquitous access to all operational data and reduces the need for lengthy and costly installations of MII alone
- 2. PI System data consumers (like MII) can access its unlimited, high-resolution real-time and historical data
  - As an SQL DB, 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
- 3. MII supports connectivity to other enterprise applications outside of just SAP such as:
  - Inventory management systems
  - Transportation management systems
  - Time and attendance systems
  - Procurement Systems





# Thank you

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