OSIsoft®

REGIONAL SEMINARS 2012

The Power of Data

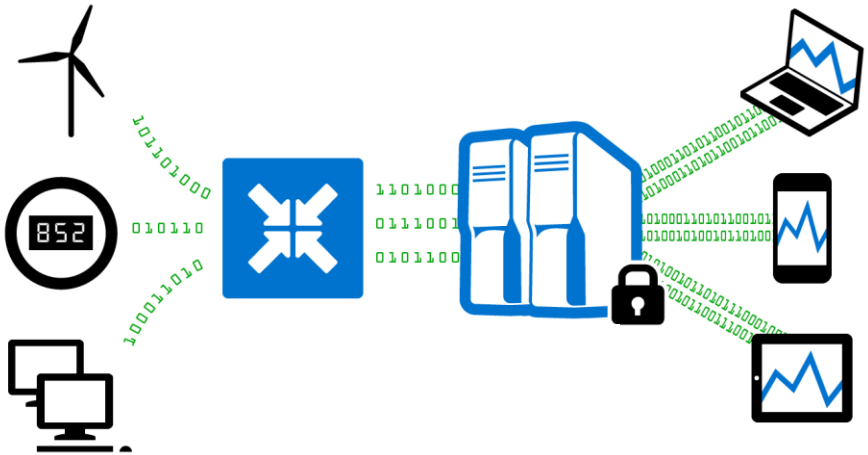
Infrastructure for Streaming Data and Events The PI System

Presented by **Gopal GopalKrishnan, P.E.**

Product Manager, OSIsoft, LLC.

Examples of infrastructure

- ✓ Water
- ✓ Electricity
- ✓ Gas
- ✓ Telephone
- ✓ Transportation
- ✓ Internet



Data as a Utility

Data be available without a lot of friction

Data challenges

- Heterogeneous data landscape
- Sampling rate, fidelity, scale
- Adapt to changing business requirements
- New regulations, new corporate initiatives
- Why Infrastructure instead of point solutions
- …

Challenge

Heterogeneous data landscape

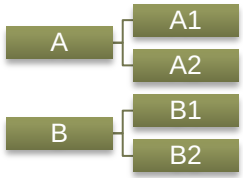
Challenge: Heterogeneous Data Landscape

Types of Data

Time Series

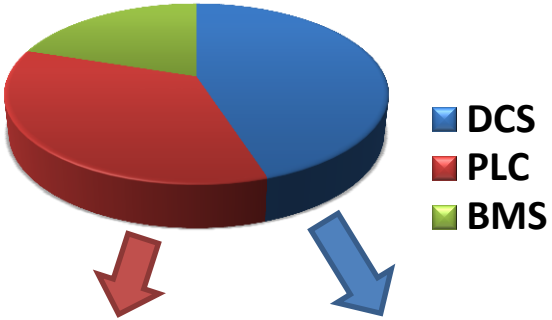
Relational

Hierarchical

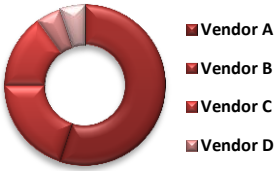


Unstructured

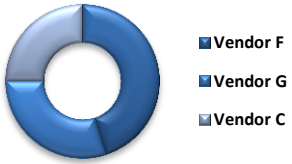
Process Control Systems



PLC Vendors



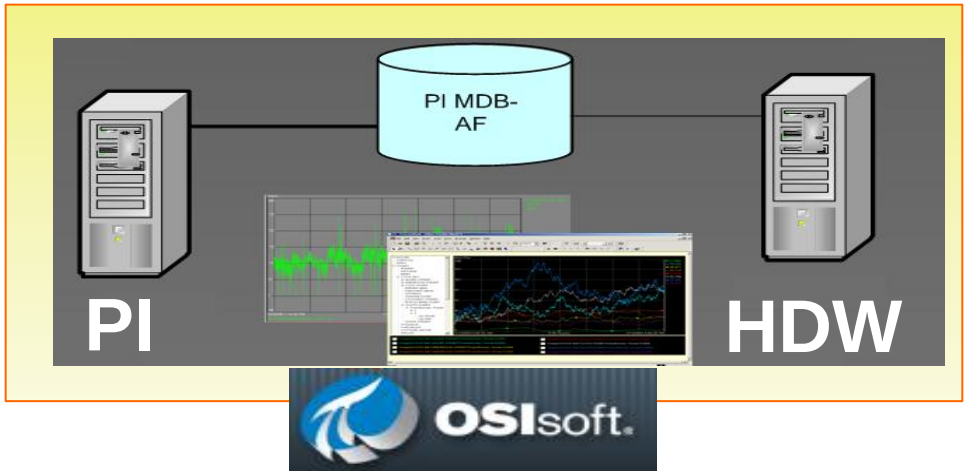
DCS Vendors



Geography

Data Consolidation

PSE&G
We make things work for you.



Distribution SCADA

Transmission SCADA

ESOC PI

Transformer loads

MV-90

Weekly substation inspection

PI Manual Logger

SAP PM work history

Hydran

Gas results

Doble

Electrical results

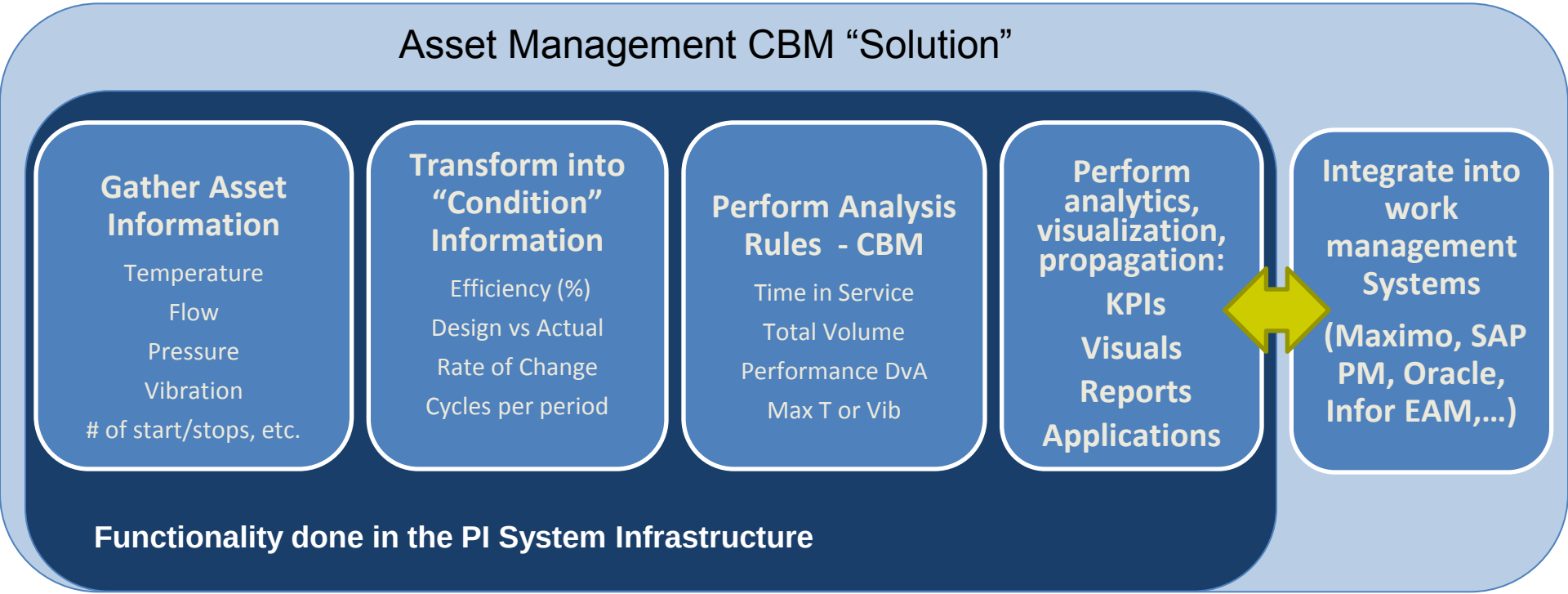
Breaker Tests

Diagnostic data

Delta-X

Transformer oil analysis

Asset reliability



Asset health score

Address http://njrwkdev29/Asset%20Managment2/WebPages/LtcsCA-ActionSummaryNew.aspx

Home Documents and Lists Create Site Settings Help

PSEG LTC CA-Action New Summary Report

CA Records

Details	Division	Floc	Floc Descr	Equipment	Equip Descr	Score	Person	Status
	CE	IPE-CE-POH -T1	# 1 Transformer	000000000010504694	Load Tap Changer (UVT)	6.25		
	CE	IPE-CE-SDN -1TRX	500-1 Transformer	000000000010505424	Load Tap Changer A (LRS700)	4.9	George	Pending Action
	SO	IPE-SO-SLA -T1LTC	220-1 Transformer Tap Changer	000000000010526193	Load Tap Changer SEL 220-1	4.4	Mark	Pending Action
	ME	IPE-ME-HAW -T2	# 2 Transformer	000000000010507132	Load Tap Changer	3.1	Paul	OK
	CE	IPE-CE-SDN -1TRX	500-1 Transformer	000000000010505426	Load Tap Changer C (LRS700)	3	George	Pending Action
	CE	IPE-CE-SDN -2TRX	500-2 Transformer	000000000010505430	Load Tap Changer C (LRS700)	3	Mark	Pending Action
	CE	IPE-CE-SDN -2TRX	500-2 Transformer	000000000010505427	Load Tap Changer A (LRS700)	3	Mark	Pending Action
	PA	IPE-PA-HOE -T1	# 1 Transformer	000000000010542713	Load Tap Changer B	3	Paul	Pending Action
	CE	IPE-CE-WOR -T3	# 3 Transformer	000000000010540520	Load Tap Changer (LR 200)	3	George	Pending Action
	PA	IPE-PA-NEW -T40	# 40 Transformer	000000000010542737	Load Tap Changer	3	Paul	Pending Action
	CE	IPE-CE-SBB -2TRX	500-2 Transformer	000000000010621130	Load Tap Changer C	3	George	Pending Action
	CE	IPE-CE-SDN -1TRX	500-1 Transformer	000000000010505425	Load Tap Changer B (LRS700)	3	George	Pending Action
	CE	IPE-CE-GSE -31G	26-3 Transformer	000000000010023775	Load Tap Changer	2.8		
	CE	IPE-CE-SOS -T2	# 2 Transformer	000000000010503189	Load Tap Changer (URT)	2.65	George	Pending Action
	PA	IPE-PA-SWK -4PAR	# 4 PAR E-2257	000000000010542778	Load Tap Changer 4A	2.65		
	CE	IPE-CE-GSE -132-7	132-7 Transformer	000000000010501565	Load Tap Changer	2.6	Mark	Pending Action
	SO	IPE-SO-MAR -T2	# 2 Transformer	000000000010522898	Load Tap Changer Vacuum	2.5	George	Pending Action
	SO	IPE-SO-SNF -4TRX	500-4 Transformer	000000000010523970	Load Tap Changer 500-4A	2.5		
	SO	IPE-SO-MRO -T1	# 1 Transformer	000000000010525854	Load Tap Changer	2.5	Mark	Pending Action
	PA	IPE-PA-HOM -T3	# 3 Transformer	000000000010515806	Load Tap Changer	2.4		
	CE	IPE-CE-SDN -3TRX	500-3 Transformer	000000000010505433	Load Tap Changer C (LRS700)	2.4	Paul	Pending Action

Web Part Page - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites Links Google GIS Reports Information Central OAMS SP CMMS - MOSS eSHIP RtBaseline MOSS MS Office Live Meeting

Address http://njnwkdev29/Asset%20Managment2/WebPages/LTC1.aspx?eq=000000000010504694&tag=LTC1&floc=LTC&sn=SLM56073

Home Documents and Lists Create Site Settings Help Up to PSE&G Delivery

PSE&G

LTC CA New Action Algorithm Details

Modify Shared Page

Nameplate

Oneline	Division	Station Code	Station	Station Type	Floc Descr	Equipment	Equipment Descr	Equipment Type	Construction Year	Serial Number	Manufacturer	Model Number
	Central	POH	POLHEMUS LANE	H	# 1 Transformer	000000000010504694	Load Tap Changer (UVT)	E-LTC	1988	SLM56073	ABB	UVT

Content Editor Web Part

- View and Trend Equipment PI Points
- CA LTC New Action Algorithm Rules

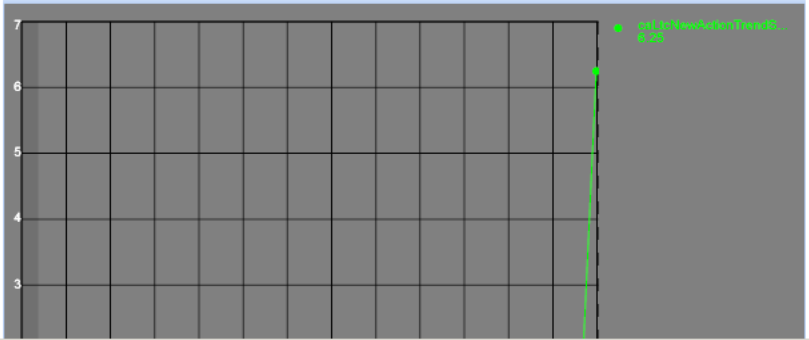
Algorithm Factors

Factor	Raw Value	Case Value	Weight %	Score
Detectable Acetylene	4915	10	25	2.5
Gas Rate of Change	6.08	5	15	0.75
High Total Gas	270243	10	20	2
High Water	48	0	10	0
Low Dielectric	34.4	0	10	0
LTC Operations	95	0	10	0
LTC THRU NEUTRAL	1	10	10	1

CA Score

Score	maxScore	Ranking(%)	Peer Group
6.25	6.25	100	VACUUM

RtTrend



DeltaX Total Combustible Gas

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Details	ApprType	Sample Date	CO	H2	Acetylene	Ethane	Ethylene	Methane	Combustible Gas
	LTC	07/06/2009	475	305	4915	40865	2.1297E+05	10714	2.7024E+05
	LTC	04/05/2007	47	0	0	1	4	2	54
	LTC	08/29/2006	168	37	0	1	3	3	212
	LTC	05/11/2006	10	0	0	1	0	2	13
	LTC	04/28/2006	48	0	0	8	28	5	89

Showing 1 to 5 of 23

DeltaX Water

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Details	Apprtype	Sample Date	Fluid Temp (C)	Water
	LTC	07/06/2009	45	48
	LTC	04/05/2007	35	21
	LTC	08/29/2006	47	38
	LTC	05/11/2006	42	7
	LTC	04/28/2006	31	28

Showing 1 to 5 of 23

DeltaX Fluid

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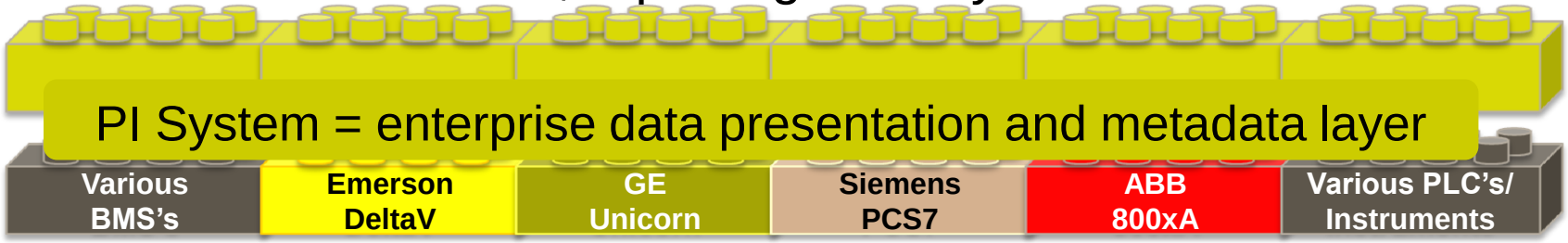
Details	Apprtype	Sample Date	Fluid Temp (C)	D877	D1816
	LTC	05/11/2006		34.4	
	LTC	08/07/2002		43.7	
	LTC	07/11/2000		37.5	
	LTC	01/14/1998			29.9
	LTC	03/10/1997		42.4	42.4

Showing 1 to 5 of 6

6 Months Counter Operations

Enterprise data presentation

- Disparate systems
  - distributed process control systems
  - stand-alone instruments with paper printouts
- Capture and aggregate data
  - for visualisation, reporting & analysis



BMS – Building Management System

PLC – Programmable Logic Controller

Manufacturing requirements

- Collect all data (GMP & non-GMP)
  - Process, Alarm & Events, Batch Events

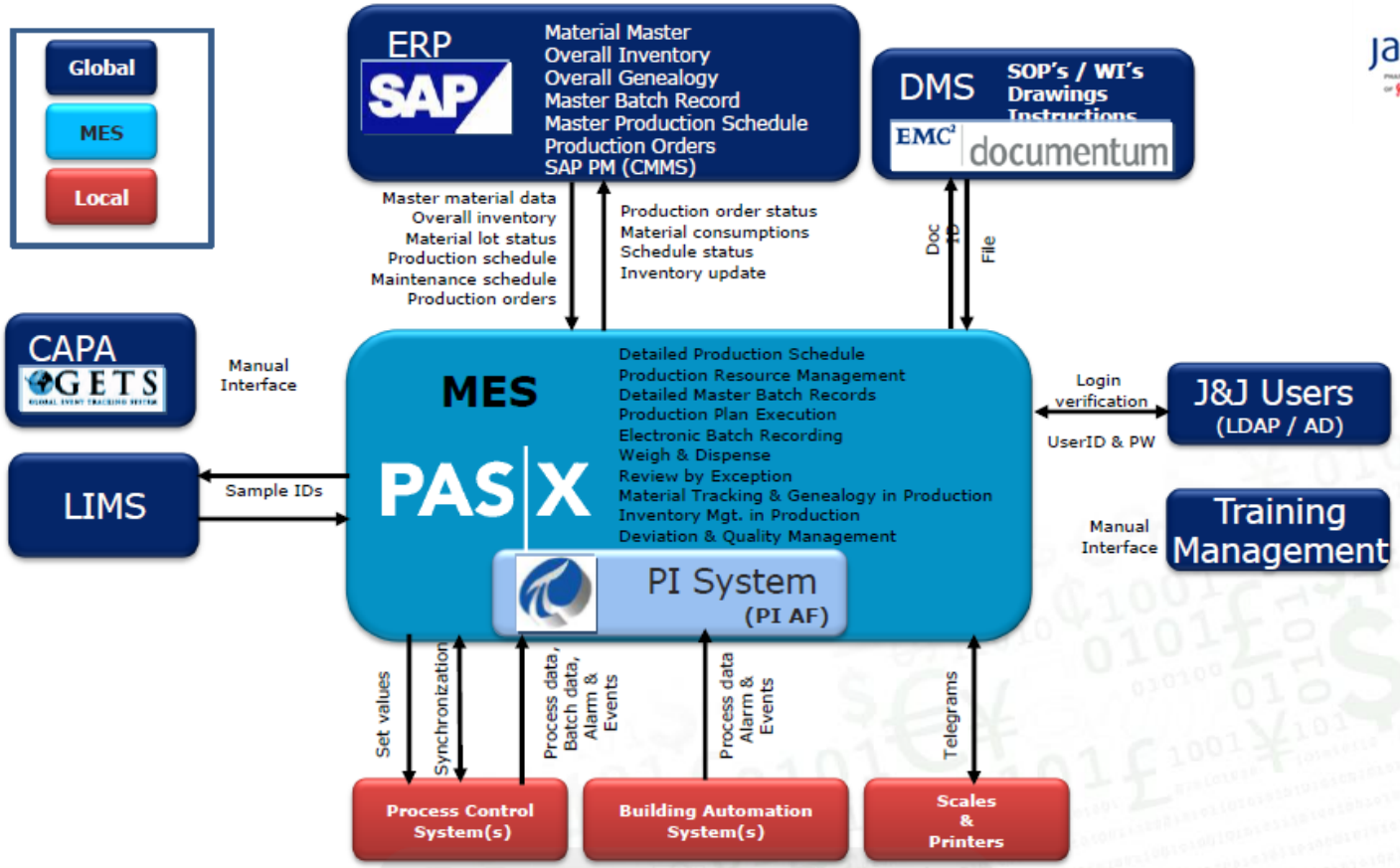
GMP= **G**ood
Manufacturing
Practice

- Deliver a consistent infrastructure globally
  - no differentiation from R&D to Pilot to Commercial

- Provide common visualisation
  - Consolidated data visualization for improved process monitoring and historical batch analysis
  - Consolidated alarm reporting for process control, building management, laboratory equipment, utility systems, warehouse equipment…

- Targeted compliance reporting
  - Autoclaves, washers (non-MES related!)

Integrated Manufacturing Systems



Challenge

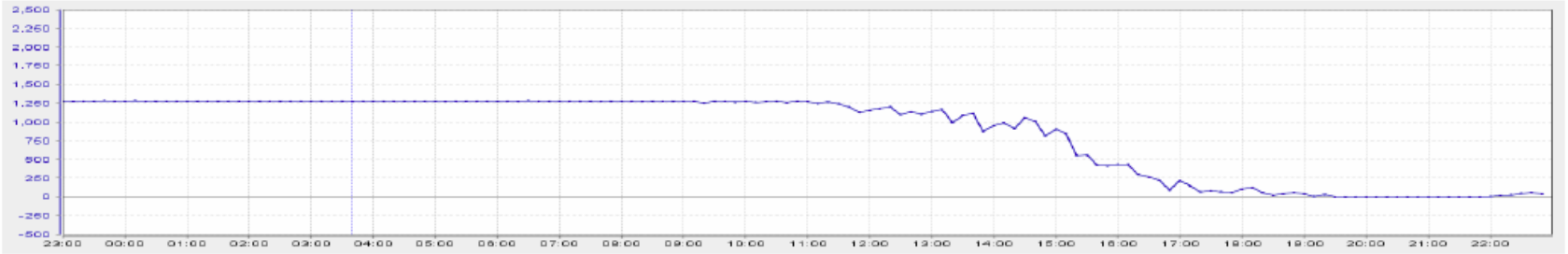
Data fidelity, sampling rate, scale…

What could you be missing?

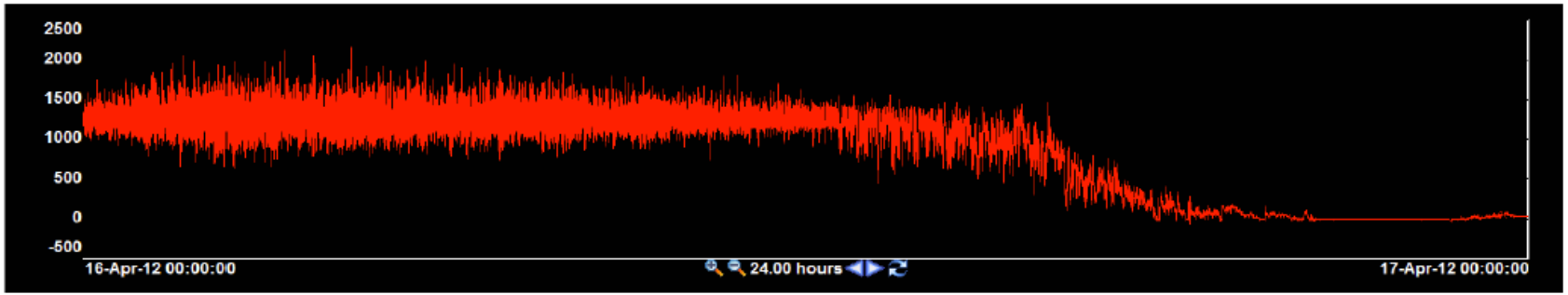
SUZLON
POWERING A GREENER TOMORROW

Active Power - 10 minute vs 1 second sampling

SCADA



PI

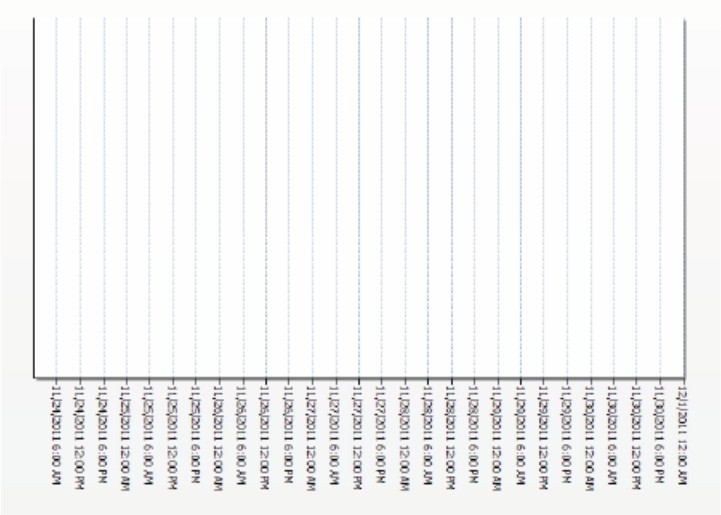


Even better …

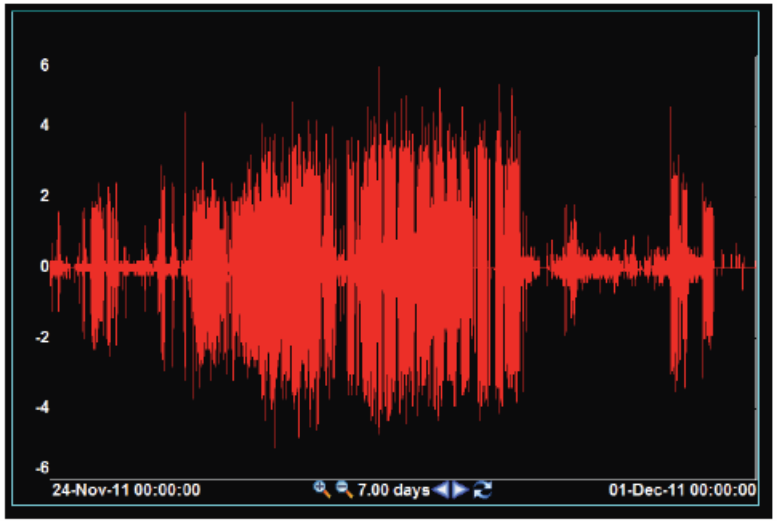
SUZLON
POWERING A GREENER TOMORROW

10 minute drive train vibration data vs. 1 second data…

SCADA:



PI System:



Suzlon: Direct to Controller Integration…

SUZLON
POWERING A GREENER TOMORROW

"Having all analog values, digital states, fault states, user info, controller KPIs, and parameter settings adds a significant amount of value to a PI System."

Chris Wozniak – Senior SCADA Engineer, Suzlon

More Data Challenges

Harder to Search & Find Information

Speaking Different Languages

External Data Sources

Spreadsheet Data Integration

Multiple Versions of the Truth

Nalco Company:

Essential Expertise for Water, Energy, and Air℠

- World's leading process improvement company
- 70,000 customers in more than 130 countries
- 75 years of experience in the hydrocarbon industries

Nalco's Value Proposal

"This solution allows us to offer our customers high-quality performance data, and allows them and our service engineers to optimize treatment programs for maximum cost/performance and sustainability credits, as well as benchmark their operations ."

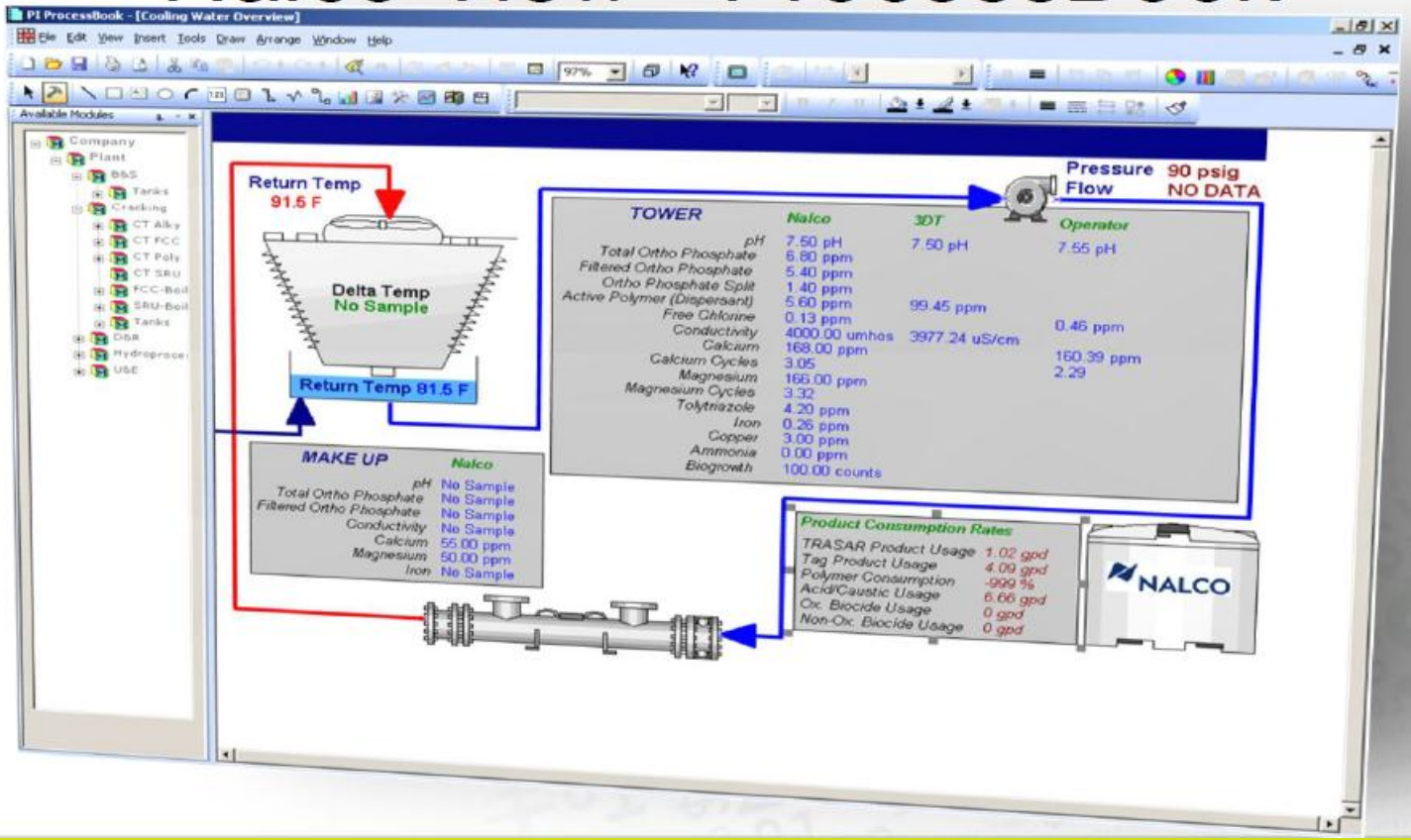
- Visibility Across Customer Chain
- Software + Services
- Enabling People to Provide Value-Add

The Result: Dynamic Access to Real-Time Data

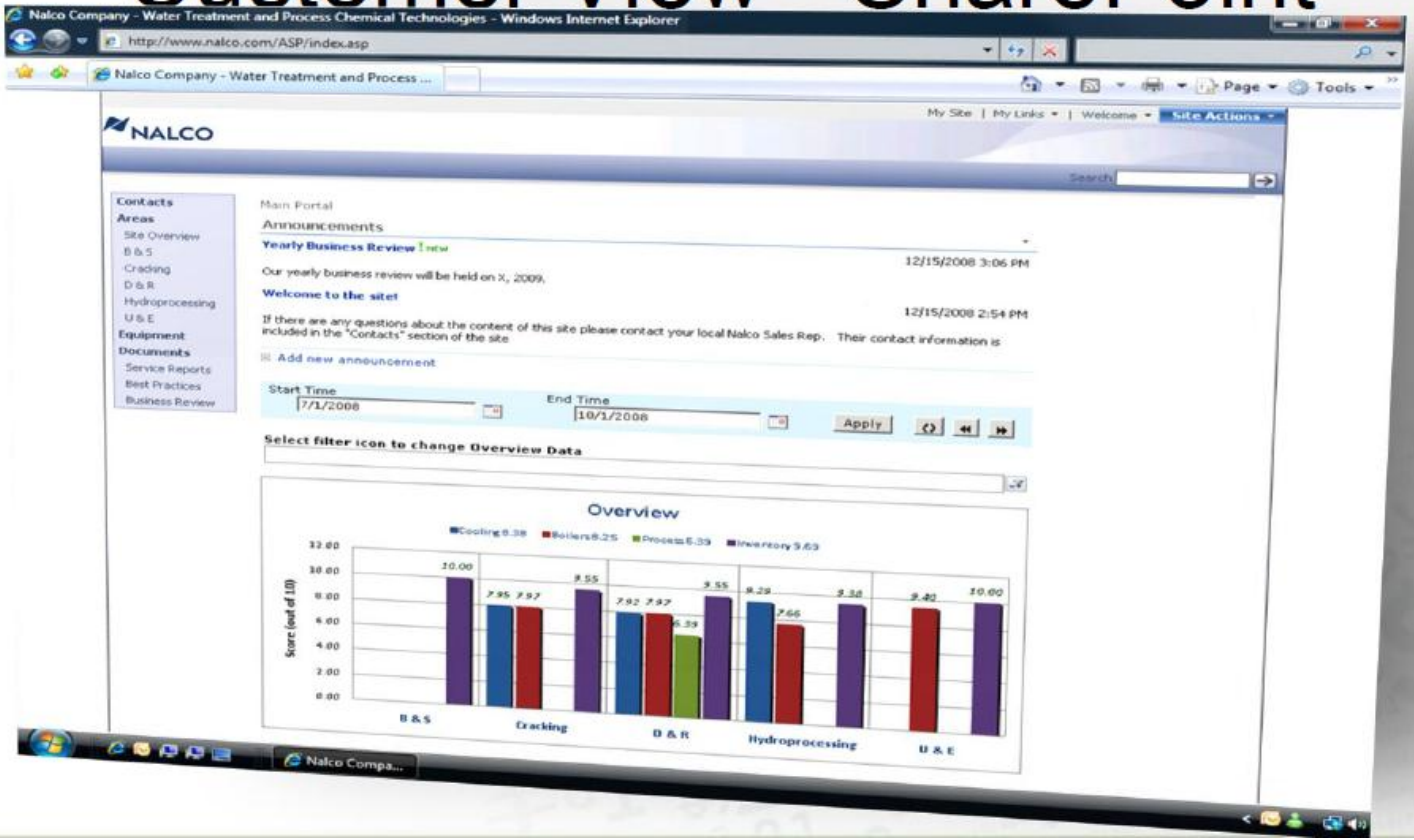
- Integration of Nalco and Customer data to provide the whole picture
- Condition-based maintenance and performance optimization
- Role-based visibility into plant operations and performance
- Summary and KPI information to customers and Nalco management
- Client-based tools to provide plant engineers with additional customized information analysis

Put the results in customers hands to bring greater value to the service Nalco provides

Nalco View - ProcessBook



Customer View - SharePoint



Challenge

New regulations, or

New corporate initiatives (sustainability)

Regulations

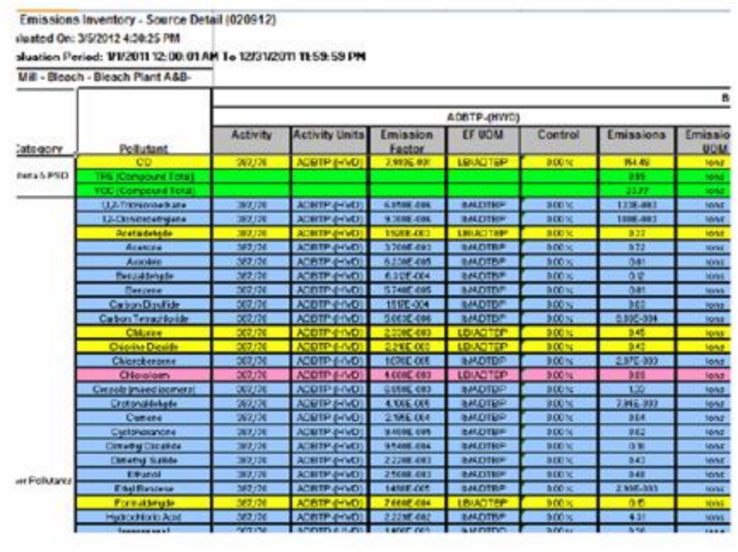
- Clean Air Act
- FERC
- NERC CIP
- Sarbanes Oxley
- 21CFR Part 11
- OSHA Cal/OSHA

PULP & PAPER

International Paper

Environmental Monitor: Automation Journey

“The CEMR system allowed us 30 days to analyze data before (Information Collection Request) deadline.”



Customer Business Challenge

- Consolidate environmental reporting using live process measurements

Solution

- Built solution around the PI System installed in the 1990’s

Customer Results / Benefits

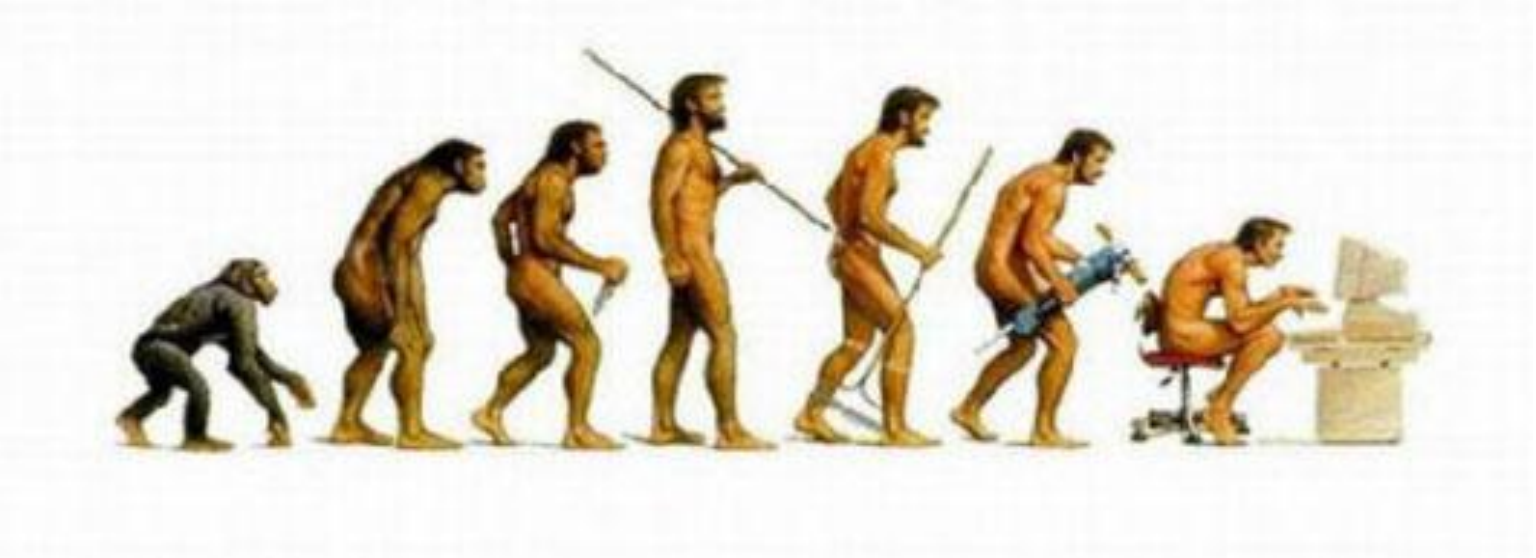
- Achieved cross report consistency
- Gained ability to respond to “Impossible” data requests
- Enabled sustainability goals by providing a common data source

Why Infrastructure approach is better?

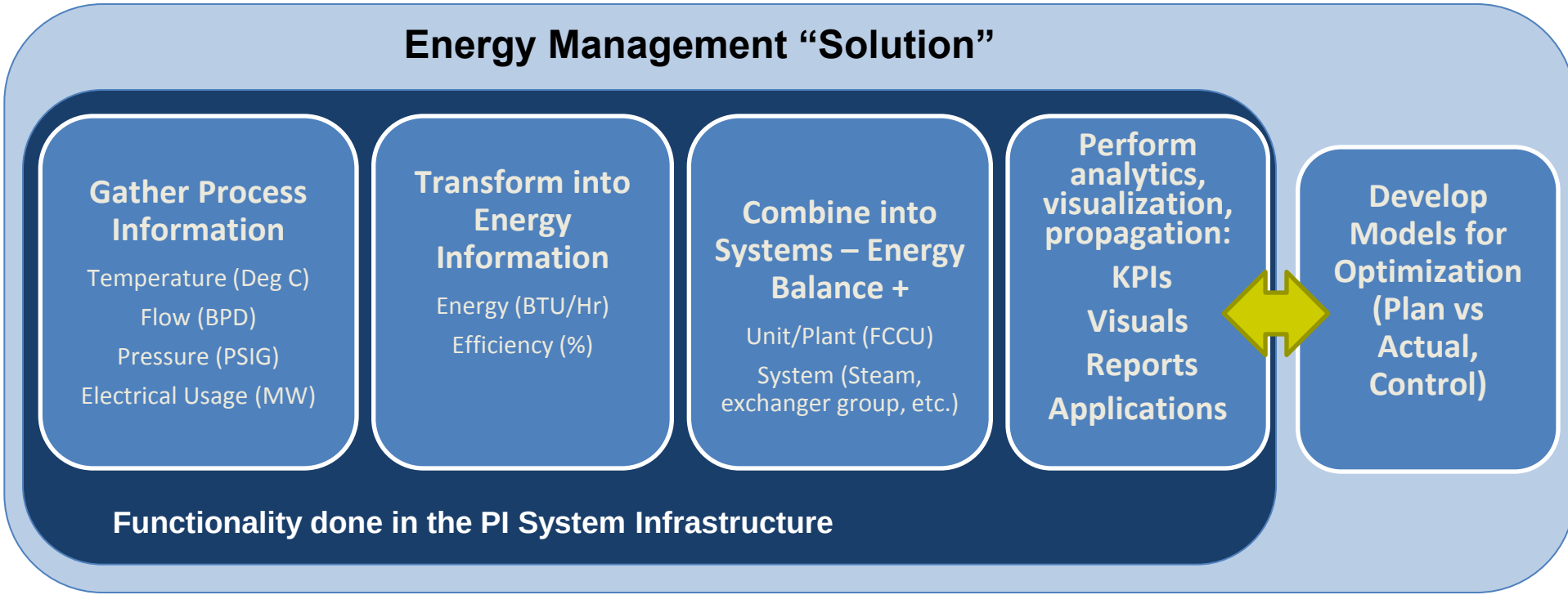
Solutions vs. Infrastructure

- Cost curves (Capital vs. Operational)
- Support Lifecycles
- Where does the knowledge end up
- Probability of Success
- Evolution of requirements over time
- Project N+1 costs less
  - Faster delivery of value
  - Start when people are ready (less RFP process if you already have it)

Systems you build evolves over time

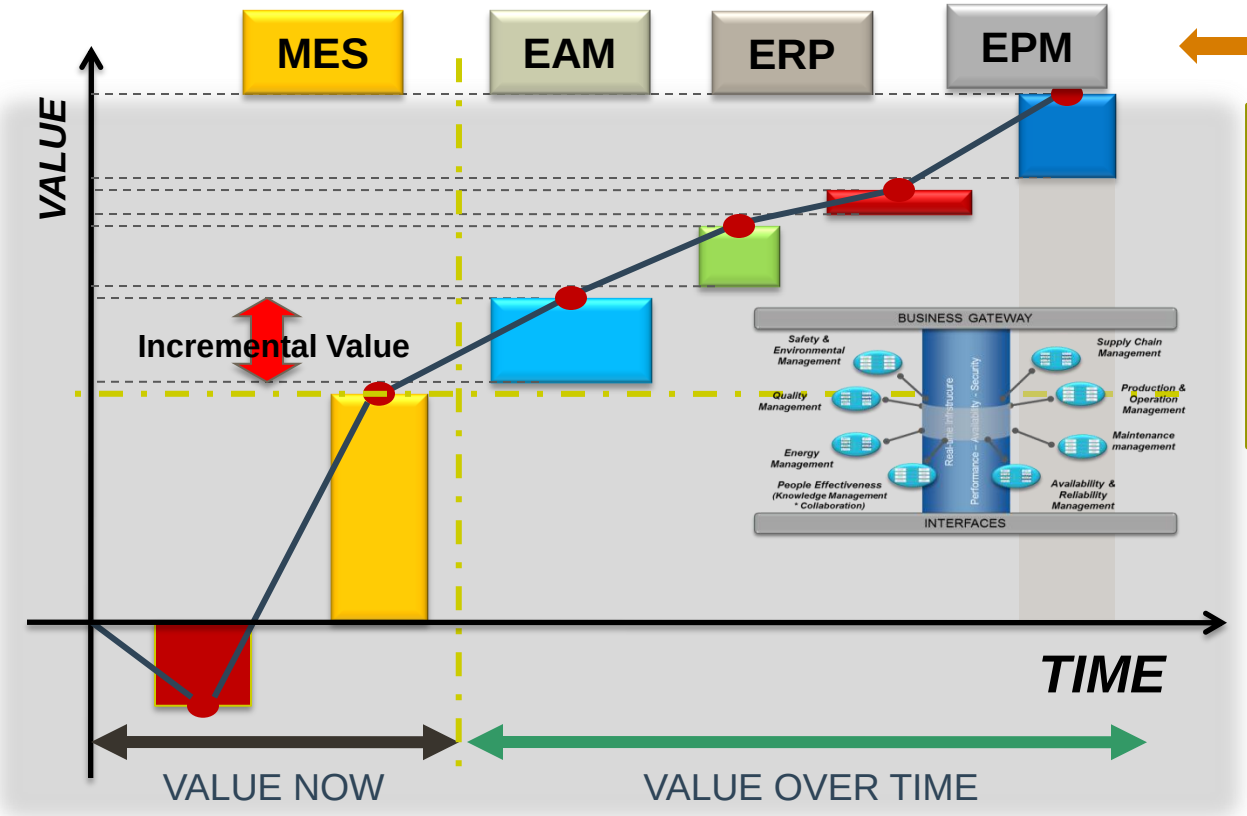


Energy reduction



PI System infrastructure in MOM and EMI

MOM=Manufacturing Operations Management



MOM and EOM Solutions

Performance Management

Environmental Reporting

Equipment Health Mgmt.

Operations Management

SMI/EMI Configured Applications

Site/Enterprise Manufacturing Intellegence (SMI/EMI) Infrastructure Value

Site/Enterprise Manufacturing Intellegence (SMI/EMI) Infrastructure Initial Investment

Neutral Vendor

- Pure play vendor

- Unique capabilities
  - Asset centric capabilities
  - Event Management
  - Industry leader in data security
  - Highest performing and best scaling total solution

And, there is more…

- World class technical support
- Center of Excellence (CoE)
- Partner Solution Showcase
- OSIsoft vCampus http://vCampus.osisoft.com
- Ecosystem

Contact

gopal@osisoft.com

Product Manager

OSIsoft, LLC

Call to action

What's your new initiative that leverages the PI System infrastructure?

THANK YOU

Brought to you by OSIsoft.