



# Improving Operations for Business Impact: Using Your Data Asset as an Enabler for Competitive Advantage

Presented by **Lance Fountaine**

**Industry Principal, Mining, Metals and Materials**

# Company Visions

# The OSIsoft Vision

We believe **People** with **Data** can **Transform** their world

# Typical Industry and Manufacturing Vision

Commodity Production: Low Cost Producer

Sustainability: Eliminate / Minimize Risk

Value-Add Production: Products that Differentiate

# **An Operational Intelligence Strategy: The Marriage of our Visions**

# What Challenges / Opportunities Exist within Your Operations?

## Challenge – Market Conditions

- Commodity Market Prices
- New or Improved Operations / Known Technology Competition
- New, Competitive Manufacturing Technologies

## Challenge – Cost Headwinds

- Energy Costs
- Raw Materials Costs
- Labor Costs
- Logistics / Transportation Costs
- Aging Assets / Sustaining Capital Requirements

## Other Challenges

- Geology – Decreasing Yields on Known Reserves
- Environmental Regulations / Reporting Requirements
- Slow Global Economic Recovery

## Opportunities

- Commodity Market Growth in Developing Countries
- Market Pull for New Materials / Alloys (Strength, Weight)
- Sustainable Materials

# Information as a Competitive Enabler: The Concept is *Not New*

## Common Operations Programs

- SPC (Statistical Process Control)
- Lean Manufacturing / Six Sigma
- TPS (Toyota Production System)
- Continuous Improvement / Deming Cycle

## Improving Plant / Enterprise Performance Management

- Established / Managed KPIs
- Visibility into Uncontrollable Impacts (e.g., Energy Rate, Raw Material Rate, Metal Prices, etc.)
- Engaged Workforce driving Collective Innovation
- Enabling Platform for Process CoEs (Centers of Excellence)
- Leverage / Adoption of Best Practice

# What If Your Company had the Ability to Leverage Its Current Data Assets to...

## Improve Enterprise Visibility and Management (Operating System)

- Establish and Automatically Report Standard KPIs to Measure Performance
- Support Operations through Global and Regional CoEs (Centers of Excellence) or Remote Operation Centers
- Drive Real-time Action in Support of Operational Excellence
- Rapidly Identify and Leverage Best Practices
- Increase Employee Engagement with Continuous Improvement Innovation

## Improve Awareness and Forecasted Impact of Uncontrollable Factors

- Rising Energy Rates
- Rising Raw Material Costs, Reduced Raw Material Quality
- Rising Water Rates
- Rising Labor Rates
- Cost of Environmental Regulation / Mandates

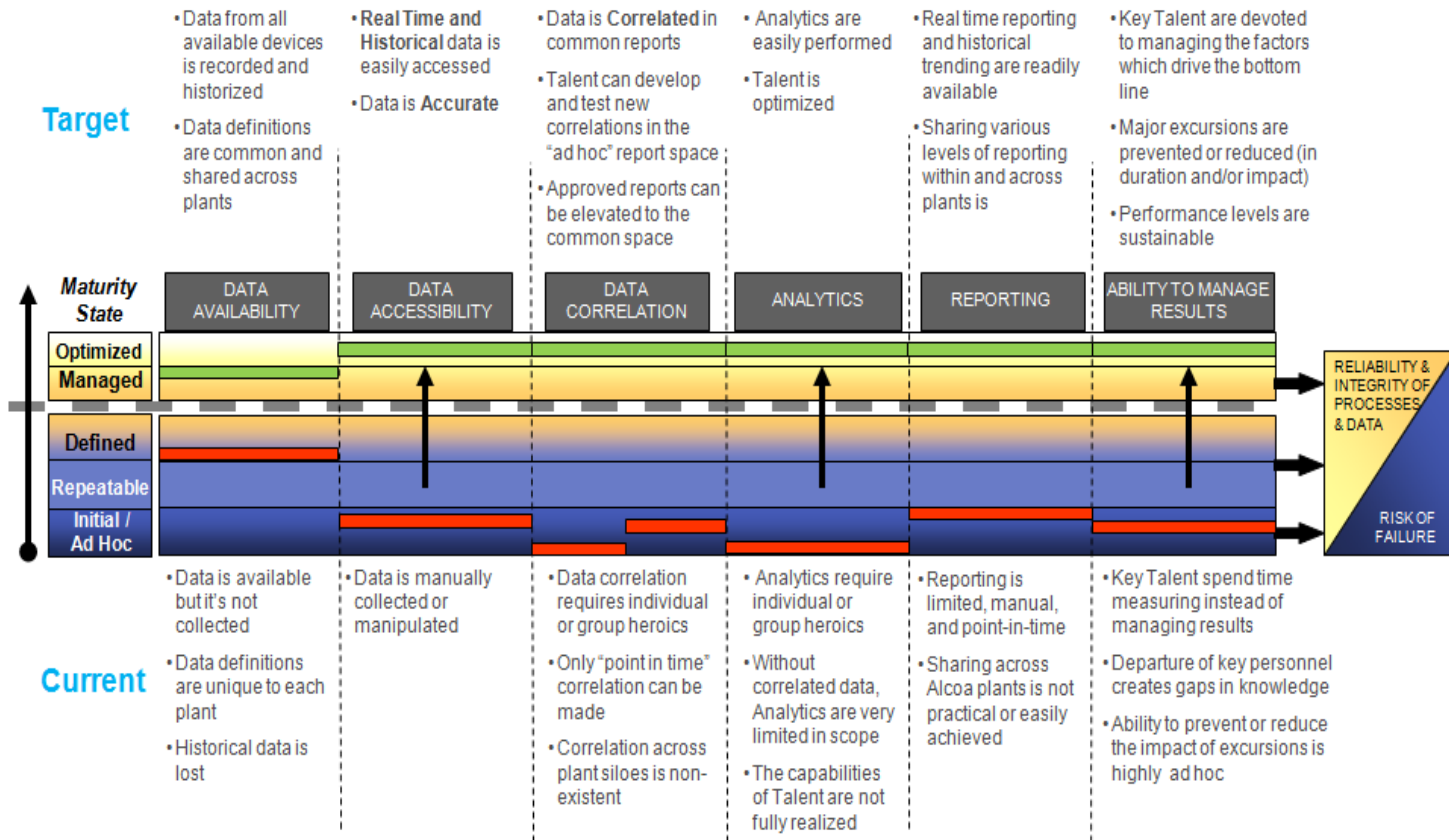
## More Directly Impact Controllable Costs / Performance

- Continuously Improve **Process Productivity / OEE**
- Better Control **Product Quality** / Improve **Genealogy Tracking**
- Extend **Life of Critical Assets** / **Reduce Maintenance Costs**
- Reduce **Energy / Raw Material / Natural Resource Consumption**
- Continuously Improved **Environmental Performance** to Meet **Regulatory Compliance and Reporting** Requirements

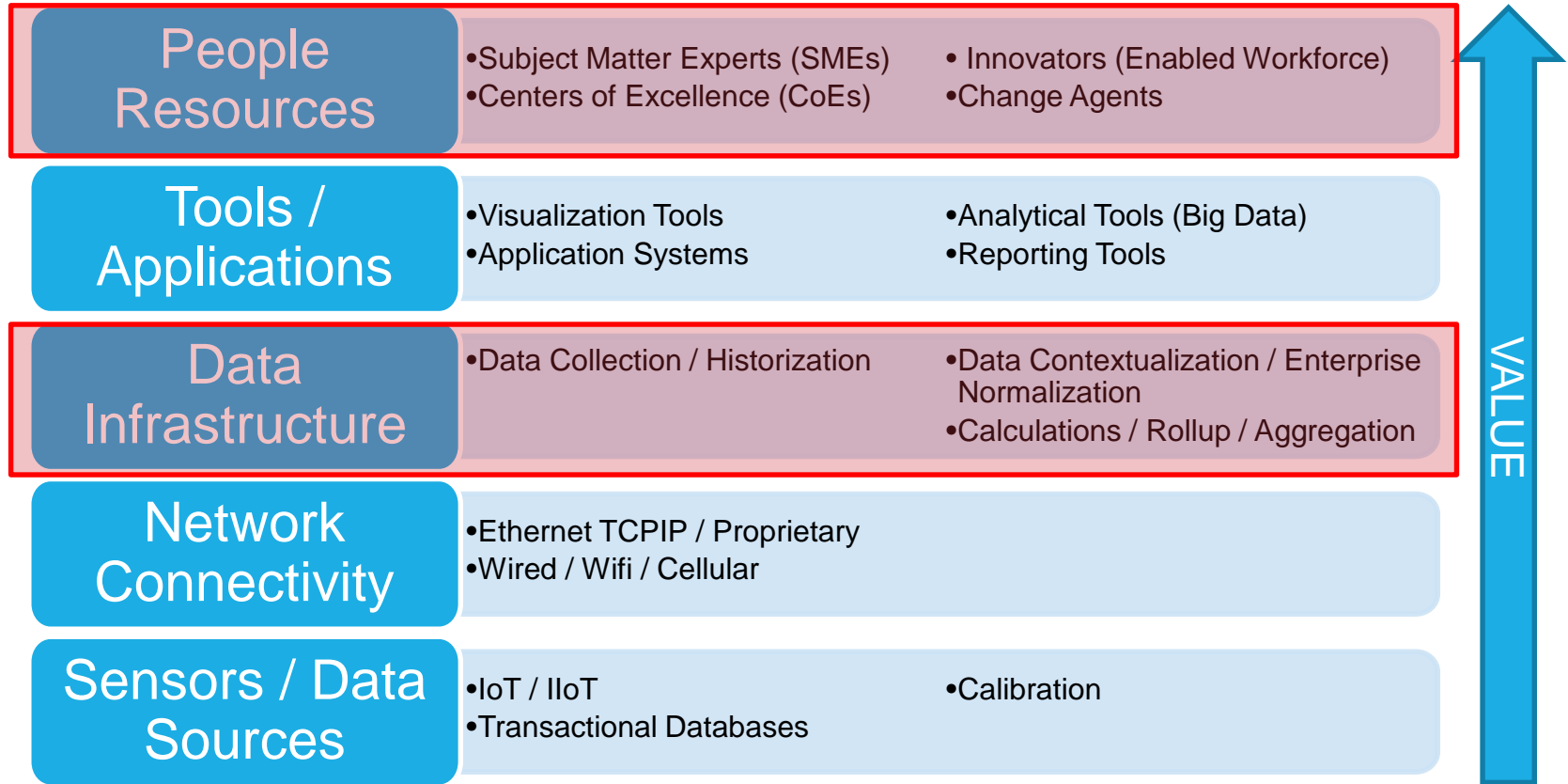


# Why the Need to Re-Evaluate Your Information Platform?

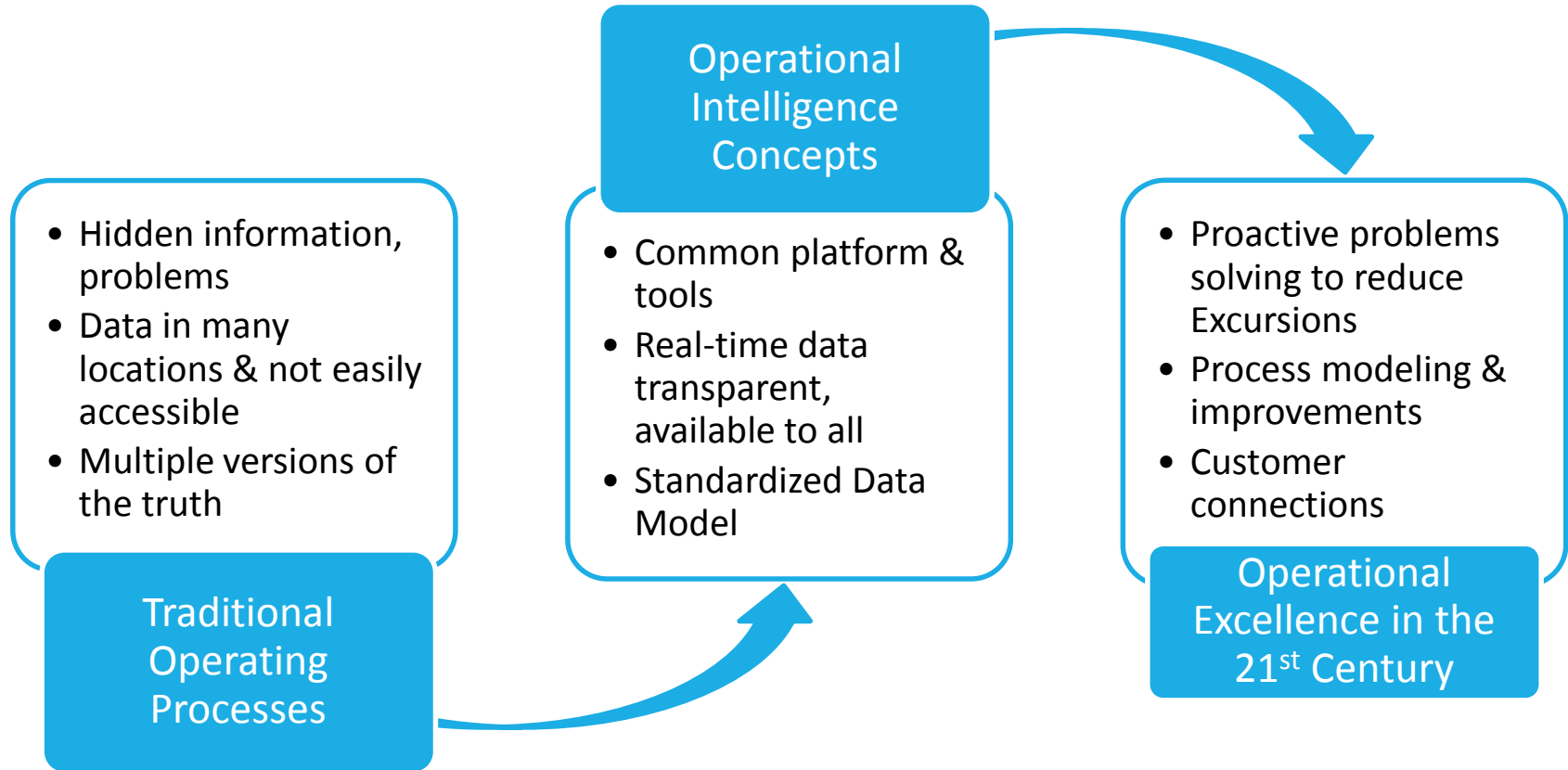
## The Data Capability and Maturity Model



# Data to Value: Recognizing the Critical Contributors



# Information and the Operational Intelligence Concept



# How Does Operational Intelligence Drive Results?

## Daily/Real-Time Operations

Intelligent Action

Frequency: Real-time to Daily

## Process Stability/Improvement

Intelligent Analysis

Frequency: Any

## Production and Operations Management

Intelligent Reporting / Integration

Frequency: Daily to Monthly

Learnings Applied: Manual or Closed Loop

## Visual Information / Notification

### Audience:

- Operators
- Craftsmen
- Supervisors

### Objectives:

- Achieve Daily Targets (DMS)
- Situational Awareness
- Resolve Immediate Issues (RCA/Problem Resolution)
- Maintain Schedule/Plan

## Learning / Knowledge Expansion

### Audience:

- Process Engineers (Location)
- Production Superintendents
- CoE Experts (Regional/Global)

### Objectives:

- Detect Excursions (Leading)
- Maintain Process Stability
- Improve Productivity
- Improve Quality

## Evaluation / Decision Support

### Audience:

- Location Managers
- Regional/Global Operations
- Business Leadership

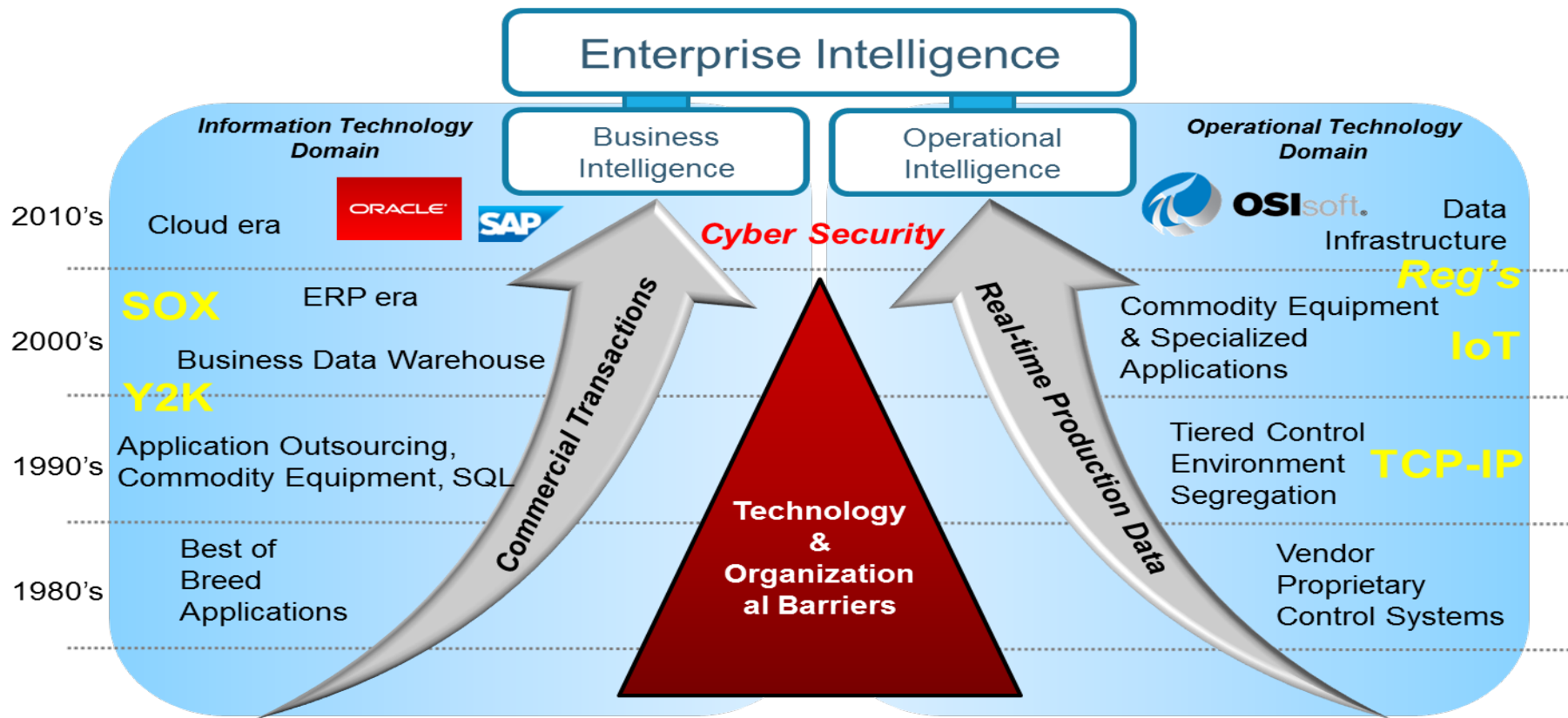
### Objectives:

- Understand/Grade Performance
- Adjust Expectations
- Establish Plans
- Calculate Forecasts

OSIsoft PI Data Infrastructure

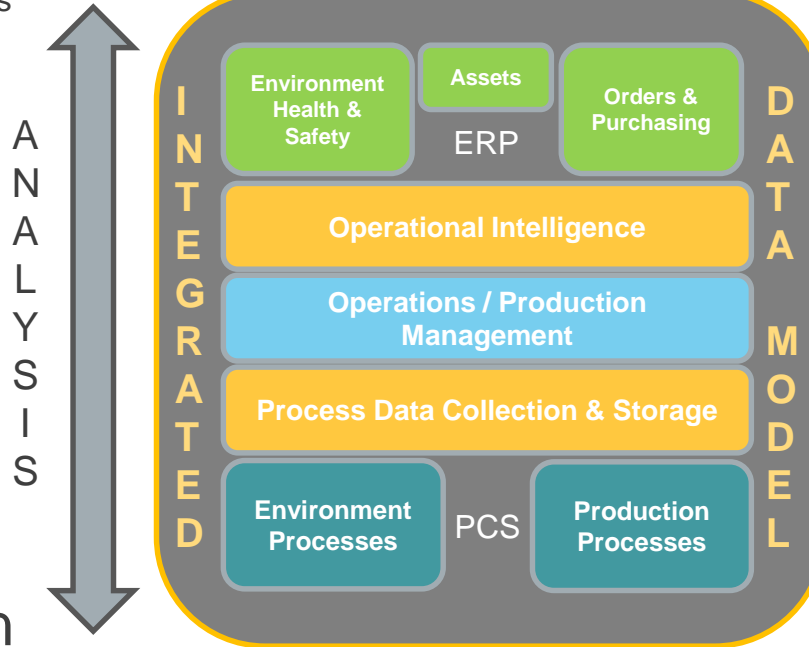
# Meeting the Technical Requirements: Recognizing IT / OT Convergence

# Recognizing IT/OT Convergence



# Defining a Standard Technical Architecture

Transactions  
Business



Action  
Operations

## Definition:

The integration of data with process expertise to enable proactive and intelligent manufacturing decisions in dynamic environments

## Key Components:

1. REAL TIME and HISTORICAL process data capabilities
2. Network / Data integration from shop floor to the enterprise
3. Comprehensive analysis toolset(s)

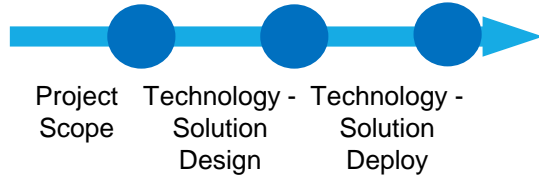
**The Architecture Ties Together Information from All Sources within a Plant and Across the Enterprise**

# Adopting a Project or Program Approach



# Project Based Approach

Project  
#1



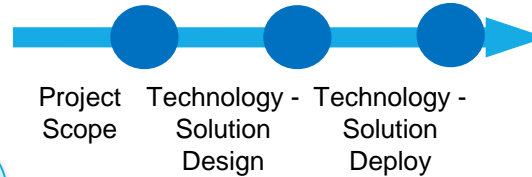
## Typical Scenario:

- Limited Technical Scope (Sources of Information / Tags)
- Fixed Project Timeline
- Working Group: Location Operations Resources working with IT / OT Resources

## Pros (often):

- Well Defined, Limited Scope
- Single Design / Deployment
- More Manageable Initial Cost

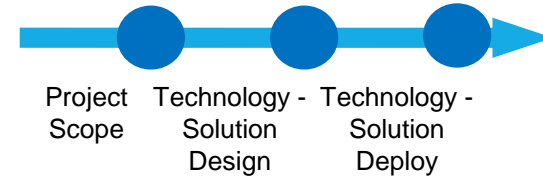
Project  
#2



## Cons (often):

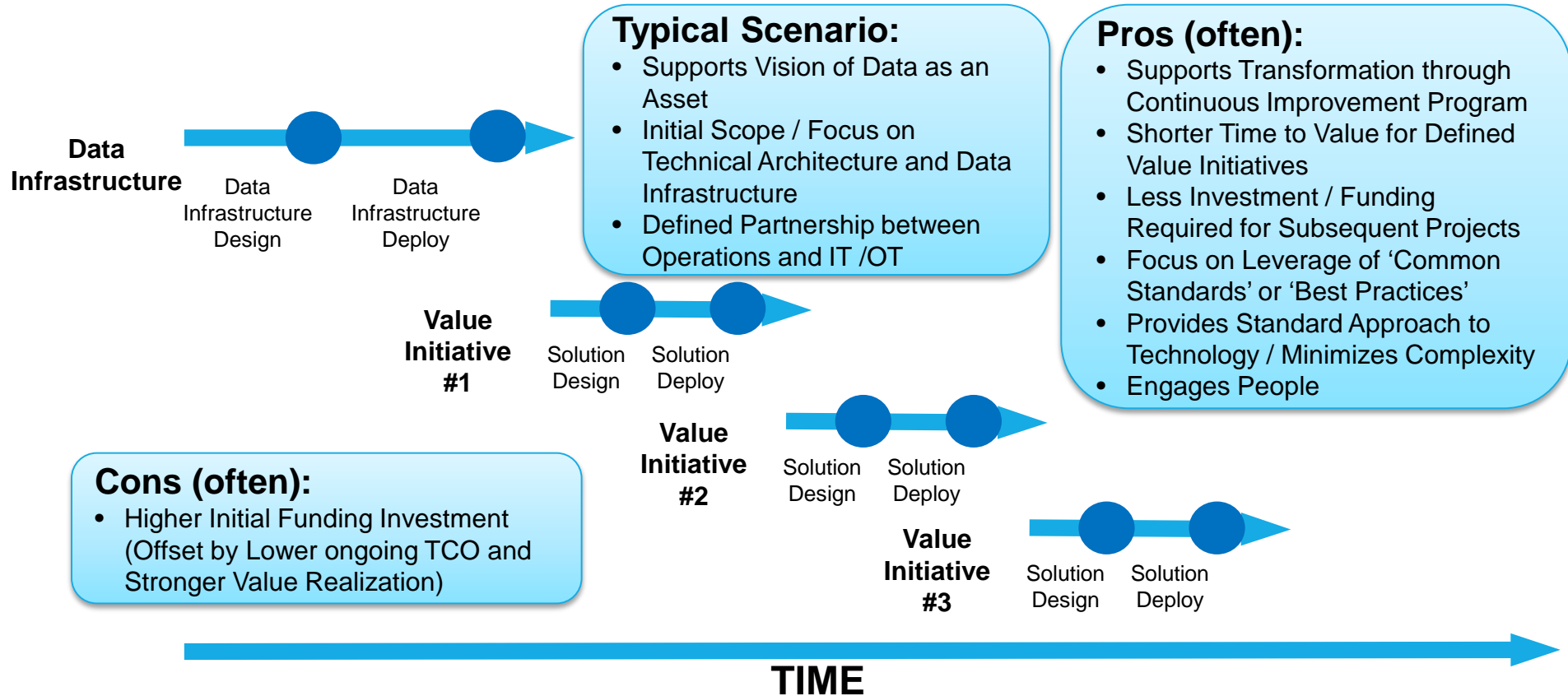
- Site Based, One Off Solutions
- Not Easy to Leverage / Deploy 'Best Practices' or 'Standards' across Multiple Sites
- New Projects Require New Software / New Solutions / New Funding / **New Start**
- Cost / Complexity Increase Over Time

Project  
#3

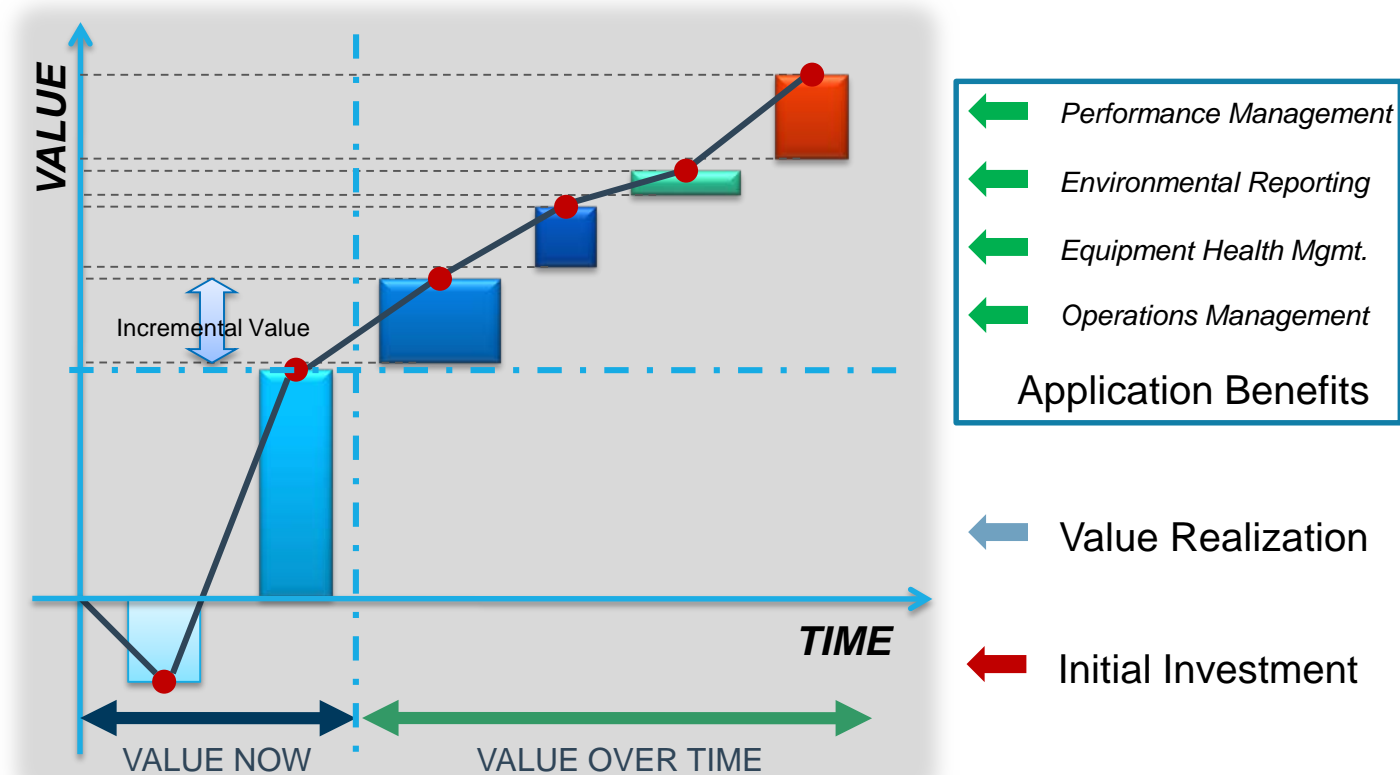


TIME

# Program Based Approach



# Value Creation – The Project vs. Program Approach



# Examples of Success

# Enterprise Operational Intelligence

Barrick Gold

“With Data, you are NOT just another person with an opinion.”

“If you do measure it, you can manage it.”



Ian Allen, Senior Manager, Mining Information Technology

## CHALLENGES

Meet the challenge of Operational Excellence

Respond to cost savings and efficiency needs of the business

Request a significant capital expenditure for this program in a time of strict fiscal austerity

## SOLUTION

Justify an Operation Intelligence program based on PI.

Concentrate effort with the greatest value – Energy & Water

Maximize training and the use of the OSIsoft CoE and Mining Industry Experts

## RESULTS

Enterprise Agreement that gives Barrick the opportunity to use PI across its mines

Significant savings in Energy costs, better water management and reporting

# Enterprise Data Access Solution

Freeport-McMoran

“We have real time monitoring in place to prevent catastrophic failure. For example, If a haul truck engine cylinder kit failure is not addressed, it can cause catastrophic failure of the engine resulting in a \$180,000 core value loss.”



Robert Catron, Program Manager/Business Solutions Architect

## CHALLENGES

Constant pressure to decrease maintenance costs

Increase their equipment health

15+ data historians across the globe, managed independently

## SOLUTION

Asset-based analytics for looking at the operational data and notice of problems in real-time

Publishing displays on the web and mobile devices for more timely and easier response

## RESULTS

Data-based platform for improving asset management

Real-time analytic capabilities via the web and mobile devices



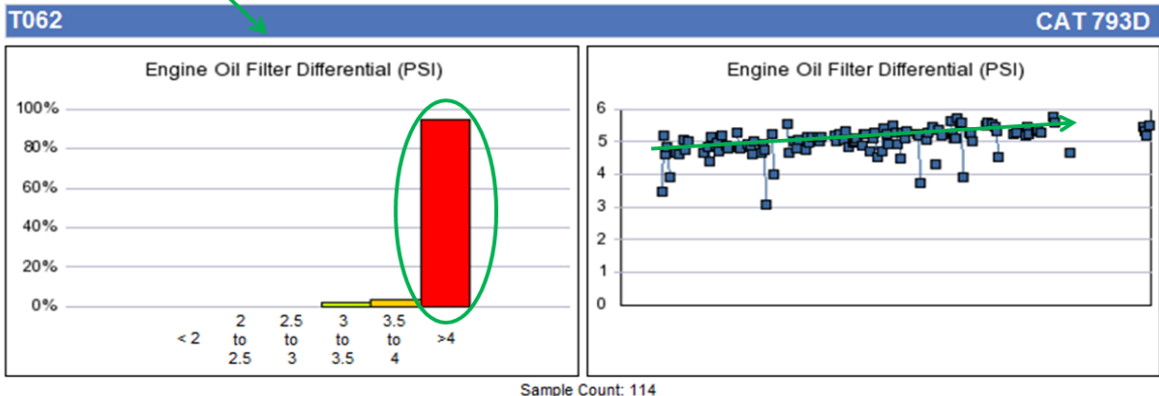
# How Did Freeport-McMoRan Deliver a Solution?

- Solution: Using Business Objects, connected to our machine data, we created a daily report that prioritizes trucks by their cylinder health.

FREEPORT-McMoRAN COPPER & GOLD		Sierrita Engine Oil Filter Differential Pressure			12/9/13 8:55 AM
		12/7/2013 12:00:00 PM - 12/8/2013 12:00:00 PM			057353
Truck	Fleet	Max Eng Oil Filter Differential Pressure	Avg Eng Oil Filter Differential Pressure	Average Engine Oil Pressure	Sample Count
T062	CAT 793D	5.76	5.01	64.21	114
T063	CAT 793D	5.44	2.69	60.49	7
T036	CAT 793B	4.81	3.81	70.14	85
T034	CAT 793B	4.49	3.6	65.11	90
T073	CAT 793D	3.92	3.4	62.6	107

This is a summary of all Haul Trucks sorted by Engine Oil Pressure descending, allowing us to quickly identify equipment with a possible cylinder problem.

Supporting the summary with detail, I can see the sample distribution and trend...validating the issue and indicating action should be taken

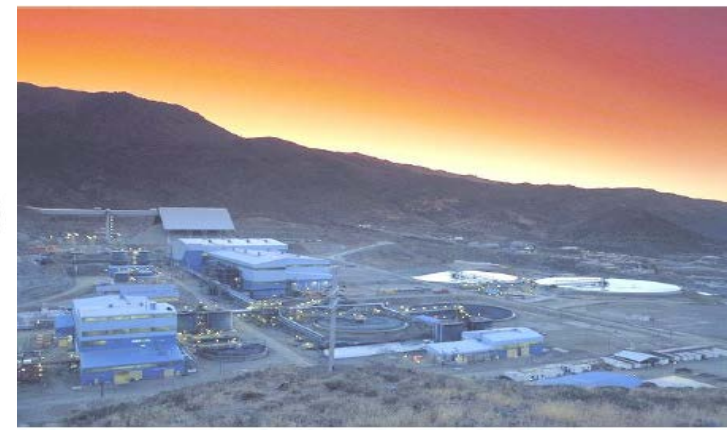


Based on the above maintenance would be scheduled and the Cylinder Kit replaced.

# Drive to Operational Intelligence

Antofagasta Minerals, CONTAC Engineering

“This is an excellent case for the precise evaluation of the multiple possibilities for remote operations management – and process improvements in mining.”



Luis Yacher, CONTAC Engineering

## CHALLENGES

Improve equipment performance and operations productivity

Minimize safety & environmental risks including energy and water management

Tighter regulatory laws

## SOLUTION

Implemented a common data platform for analysis using PI

Developed advanced process control applications for a variety of operational analysis

Deliver in-time relevant KPI's and statistics to decision makers

## RESULTS

1<sup>st</sup> line operations, engineers and analysts can add value right at point of decisions.

Remote Operations Center (ROC) can work but requires people, process and technology changes



# Data Supports Real-Time Decisions

Cemex

“We now have a reliable operational data platform, with automatic data in real-time, where we can drive improvements in areas such as equipment downtime, energy consumption and inventory management.”



Raul Roel Garza, Process Center of Excellence Advisor, Cemex

## CHALLENGES

20 year old operational data platform  
Manual data collection

Growing business with numerous  
acquisitions and divestitures

## SOLUTION

Implement a single operational data  
platform/infrastructure across cement  
based on PI

Availability of automatic, real-time data  
for decision-making and analysis

## RESULTS

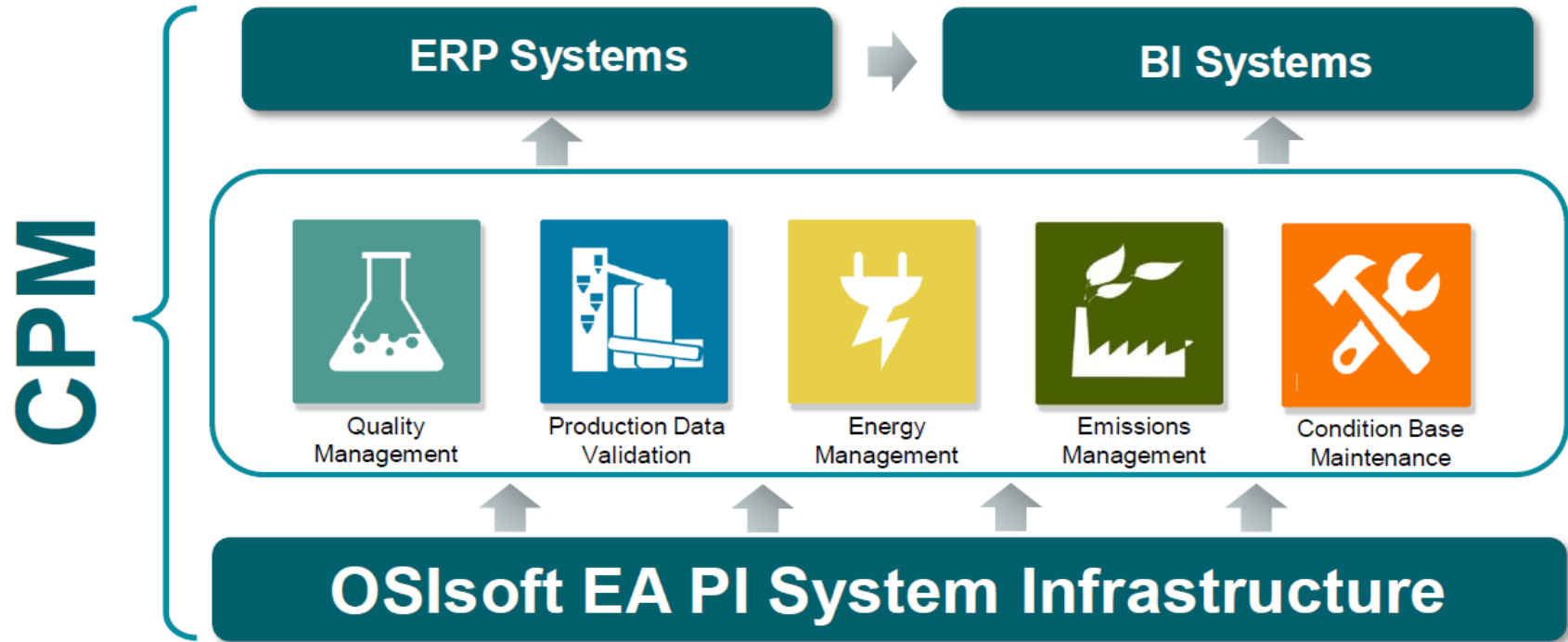
Real-time data validated for decision  
makers

Easier way for plants to review  
operational data

Maintain evidence and references for  
future audits



# How is CEMEX Using the PI System to Impact Operational Results?



# Energy Management

Anglo American Platinum

“Using the power of the PI System, Anglo Plats has been able to provide detailed visibility to power consumption at all levels of the operation. This enables us to start monitoring and reducing our power consumption.”

Michael Halhead, Lead Process Control Engineer



## CHALLENGES

Company-wide integrated approach to energy saving

Target 15% reduction in electricity consumption 2008 to 2014

Electricity getting more expensive, South Africa electrical system is constrained

## SOLUTION

Implement a data-based system using PI

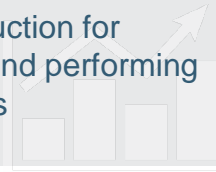
Visibility of the power use at every level

Develop high level KPIs, reporting and drill down capabilities

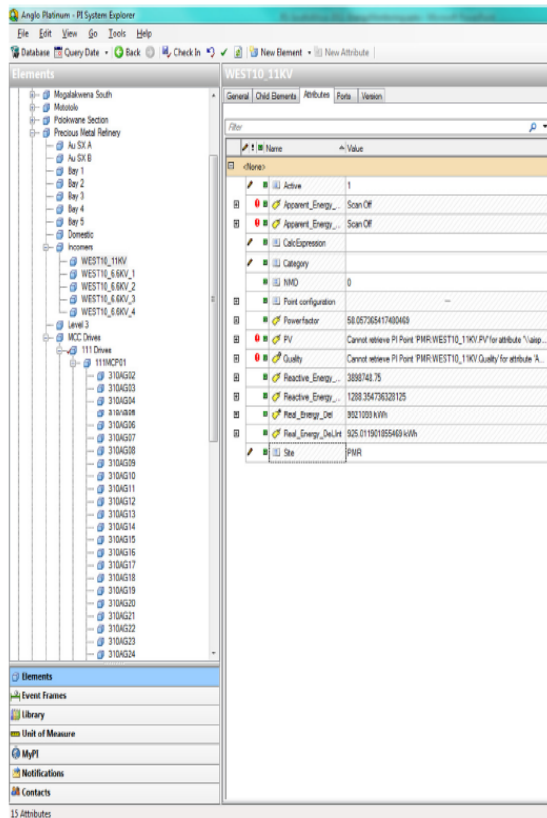
## RESULTS

Enterprise visibility of all electrical consumption - resulted in a 1% reduction in electrical power use

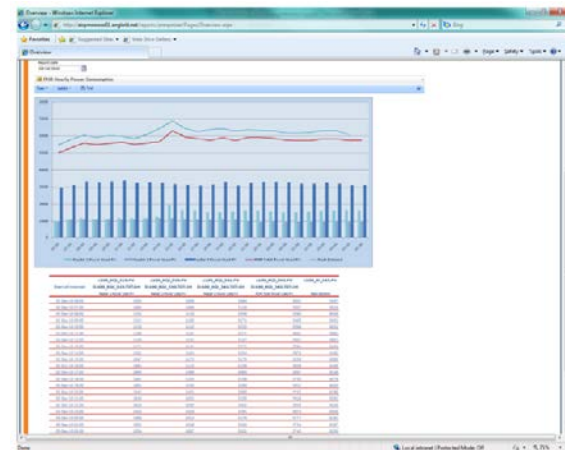
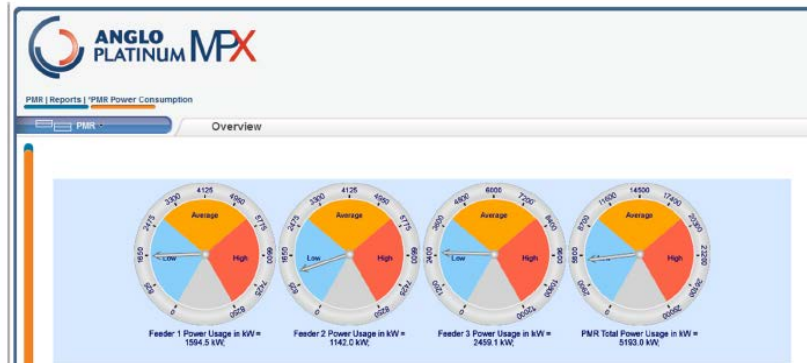
Significant time reduction for collecting the data and performing roll-ups and analysis



# How is Anglo Platinum Using the PI System to Monitor and Manage Energy?



- The raw tag based data needs to be brought into context
- Anglo Platinum is using OSIsoft's AF (Asset Framework) to provide this contextualisation
- Calculations are performed using a combination of Totalisers, Performance Equations and ACE.
- Totalisers and Performance Equations are configured through the AF Element Templates
- The AF-Link facilitates ACE
- Once the AF model is built the data can be analysed in multiple ways. Think of a real-time OLAP cube



# Improving Pot Health Analysis

Alcoa

“We’ve standardized the data and turned a massive amount of it into exactly the information that our operators want to see, sometimes summarizing it down to one or two numbers for very quick decision-making.”

Geff Wood, Director, Manufacturing Systems and Process Control, Alcoa



## CHALLENGES

Silos of data/information  
Lack of time to do analysis

Large number of pots (more than 300).  
The real challenge is to minimize pot to pot variability

## SOLUTION

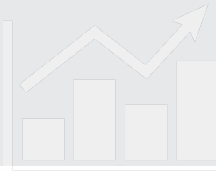
Implemented a single data infrastructure based on PI for use in the Smelter

Developed standards for data and usage.  
Implemented tools for analysis and improvement

## RESULTS

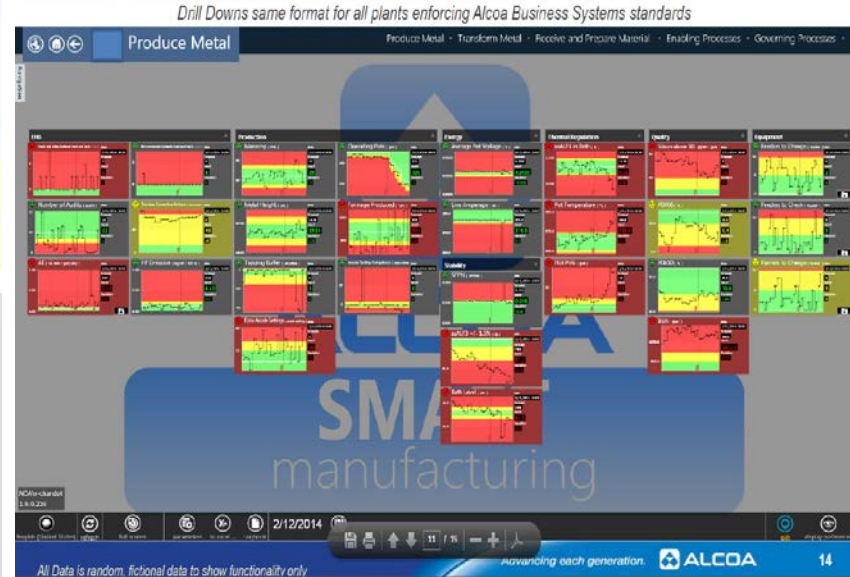
Improve OEE  
Improve control of the process

All plants using same data model as base





# Examples of How Alcoa is Managing to Improve Pot Health



# Conclusion

# Key Considerations for Today's Session

- What is your vision for the use of information within your company / division?
- What role does OSIsoft PI System play as an enabling technology?
- How can OSIsoft help you establish and execute your strategy for success?



# Lance Fontaine

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OSIsoft, LLC

# Questions

Please wait for the  
**microphone** before asking  
your questions



State your  
**name & company**

# Please don't forget to...

Complete the Survey  
for this session



The **Power of Data**  
DECISION READY IN REAL-TIME

## Evaluation Form (Seminar Location - Date)

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Email: \_\_\_\_\_

### Quality and content of the presentations

Poor Good Excellent N/A

Welcome	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Journey To Real-Time Operational Intelligence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Power of Connection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tank Level Management System	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using the PI System to Aid in Troubleshooting Operational Aspects of Oil and Gas Well Drilling and Completion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unleash your Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information on the Spot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wrap-up/Seminar Conclusion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Quality and organization of the seminar

Choice of date	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time allowed for lunch/breaks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Choice of presentations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Break and time allowed for the presentation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



THANK  
YOU