Addressing Business Initiatives with the PI System

Francois P. Bouchard, Systems Engineer
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## Business Impacts: Delivering Value at Enterprise Scale

<table>
<thead>
<tr>
<th>Safety &amp; Security</th>
<th>Energy Utilization</th>
<th>Process Efficiency</th>
<th>Asset Health</th>
<th>Quality</th>
<th>Regulatory Performance</th>
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<td>Reduced 5 unplanned shutdowns in a year</td>
<td>Reduced facilities energy costs by over $2M</td>
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<td>Prevented unit failure, avoided an expense of up to $2M</td>
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<td>$300k in savings Water temperature permit compliance</td>
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### Business Impacts: Delivering Value at Enterprise Scale

- **Safety & Security**
  - Reduced 5 unplanned shutdowns in a year

- **Energy Utilization**
  - Reduced facilities energy costs by over $2M

- **Process Efficiency**
  - Over $2.8M in savings from event prevention

- **Asset Health**
  - Prevented unit failure, avoided an expense of up to $2M

- **Quality**
  - Recovered 640M liters of treated water

- **Regulatory Performance**
  - $300k in savings Water temperature permit compliance
Business Impacts: Delivering Value at Enterprise Scale

How do these come together in the PI System?

- Reduced 5 unplanned shutdowns in a year
- Reduced facilities energy costs by over $2M
- Over $2.8M in savings from event prevention
- Prevented unit failure, avoided an expense of up to $2M
- Recovered 640M liters of treated water
- $300k in savings. Water temperature permit compliance
Modern PI Server: Data in context of assets & events

Wind Turbine #27
- 18 rpm
- Springfield
- 8-hour average
- Last curtailment code

WT27.SI.PV 18
Power of planning: From simple notes to real impact

- Reliable production estimates
- 35% reduction in energy usage
- Simplified reporting: days to minutes
How do you get started?

Where you are

Myth
Get it 100% right

Where you want to be

Risk
Run into organizational challenges
5 easy steps to plan a successful implementation

Where you are

Where you want to be

Start small.

Focus on value.

Develop a plan.
5 steps to define a plan
Imagine

What do I want?
Performance improvement, Reduced energy use

Detect anomalies
Reduce reaction time
Increase efficiency
Simplify reporting
Lower costs
Focus

Where is the easiest or biggest ROI opportunity?
Problematic equipment, High-value process

- Detect anomalies
- Transformer voltage variation

- Reduce reaction time
- Shorten vacuum phase

- Increase efficiency
- Improve rig drilling

- Simplify reporting
- Monthly EPA spreadsheet

- Lower costs
- Reduce pump maintenance
Lower costs: Reduce pump maintenance

Imagine

Focus

Elements

Pump 18
Lower costs: Reduce pump maintenance

Imagine

Focus

“What does that asset look like?”

“What tags do I have?”
What do I need for my focused initiative?

Pro-tip

Specify the final visualization, then reverse engineer needed data.

\[
[E_f] = \frac{[E_0] - [ES](1 + \frac{[I_f]}{K_I})}{(1 + \frac{[I_f]}{K_I})}
\]
Specify

What information do I want to see, and how?
Specific readings, Aggregate metrics, Trends, Reports

Type: Discharge pump

Efficiency

Time
Type: Discharge pump

Efficiency vs. Time

Specify

What information do I want to see, and how?
Specific readings, Aggregate metrics, Trends, Reports
What information do I want to see, and how?

Specific readings, Aggregate metrics, Trends, Reports
Find these readings:
- Flowrate
- X
- Head
- Horsepower

What information do I want to see, and how?
Specific readings, Aggregate metrics, Trends, Reports

Efficiency

Time

Specify
Pump operation:
• Flowrate
• Head
• Other indicators

Pump specifications:
• Horsepower
• Theoretical efficiency

Where does the data come from?
Data sources, Particular assets or processes
Design

What should I consider when designing templates?
Making comparisons, preserving simplicity, re-use

- Do I have other similar pieces of equipment that I want to compare?
- Are there components that I want to compare separately?
- Do I look at a tire without the truck?
- Do I look at a valve without the tank?
Pulling it all together

4 simple attributes is all you need to start CBM

<table>
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<tr>
<th>Elements</th>
<th>Attributes</th>
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<tbody>
<tr>
<td>Pump01</td>
<td>Flow Rate</td>
</tr>
<tr>
<td></td>
<td>Horsepower</td>
</tr>
<tr>
<td>Pump02</td>
<td>Theoretical Efficiency</td>
</tr>
<tr>
<td></td>
<td>Total Head</td>
</tr>
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Asset Based PI Example Kits: See initiatives take shape

CBM for pumps

Well drilling

Voltage monitoring

Load forecasting

...and more!

Asset Based PI Example Kits are available to everyone on PI Square.

- Search [www.pisquare.com](http://www.pisquare.com) > “example kit”
Where you are

Design
Map
Specify
Focus
Imagine

Where you want to be

- Join us for training tomorrow
- Find us at the pods to discuss your ideas
- Download free example kits
Looking for more coaching? Workshops to fit your needs

PI Discovery Workshop

Learn → Educate → Explore

PI Innovation Workshop

Enable → Execute

On-site workshops (up to 3 days), targeted at your business use case(s) with your experts and ours, and using your data and your PI System.

Contact your account manager for details.
Contact Information

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Questions

Please wait for the microphone before asking your questions

State your name & company

Please remember to...

Complete the Survey for this session
Thank You