OSIsoft: Your Partner for Engineering Education

Presented by Erica Trump, PhD

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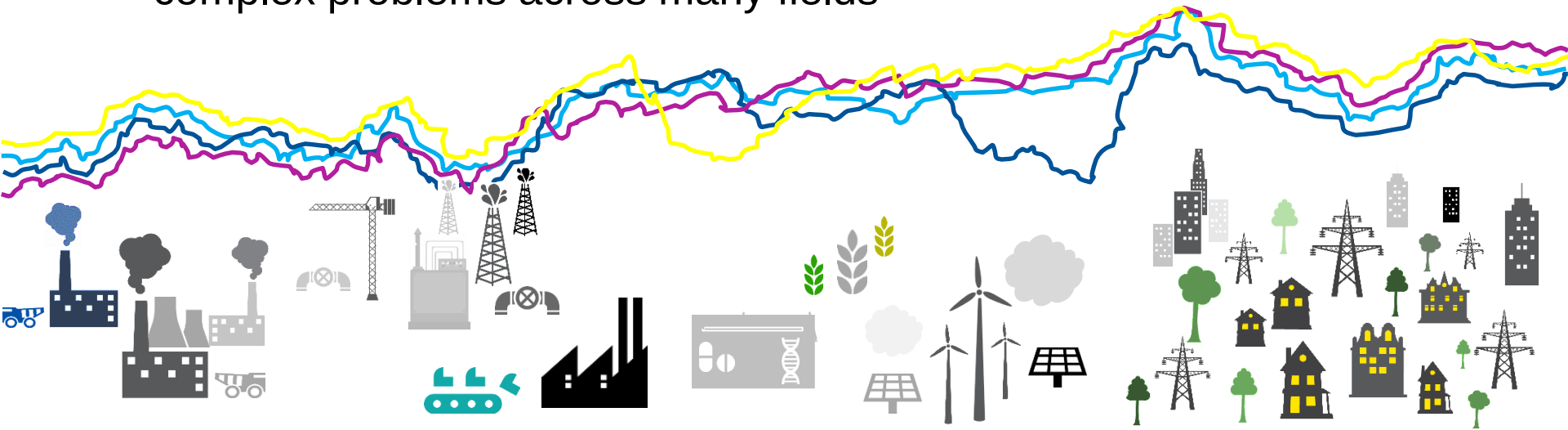
Need for Data-Focused Engineering Curriculum

- Companies own terabytes of data
- Process data is generated rapidly
- Industry demand for highly skilled employees
- Data education enables engineers to solve complex problems across many fields



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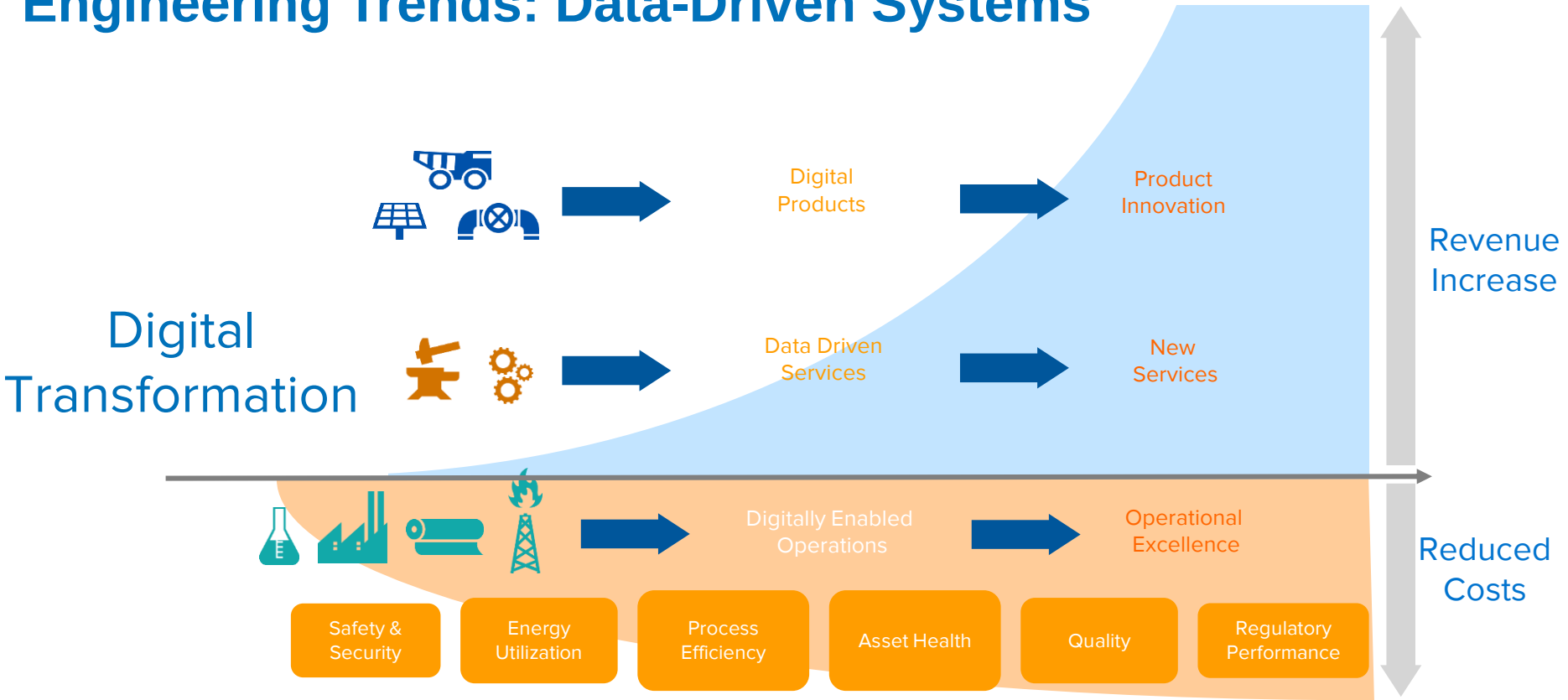
Engineering Trends: Data-Driven Systems



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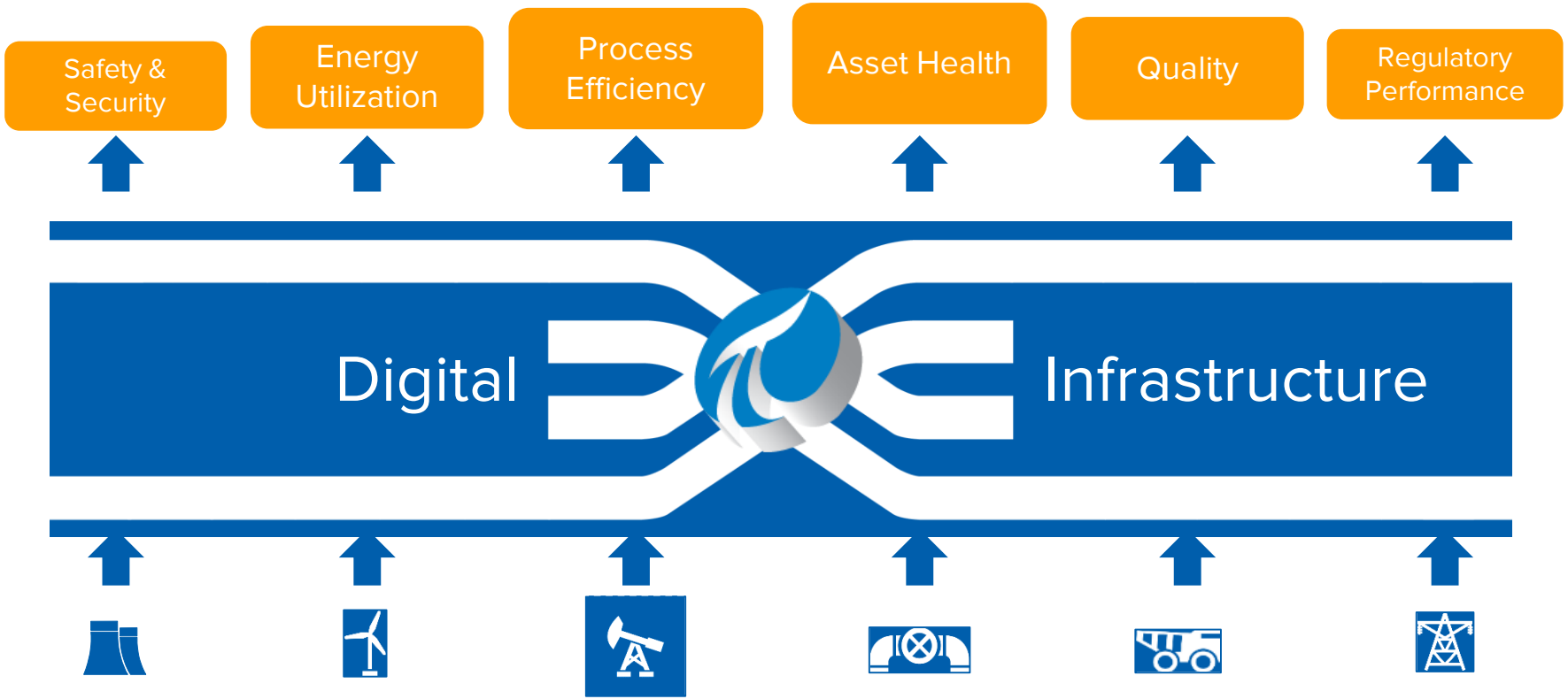
Engineering Trends: Data-Driven Systems



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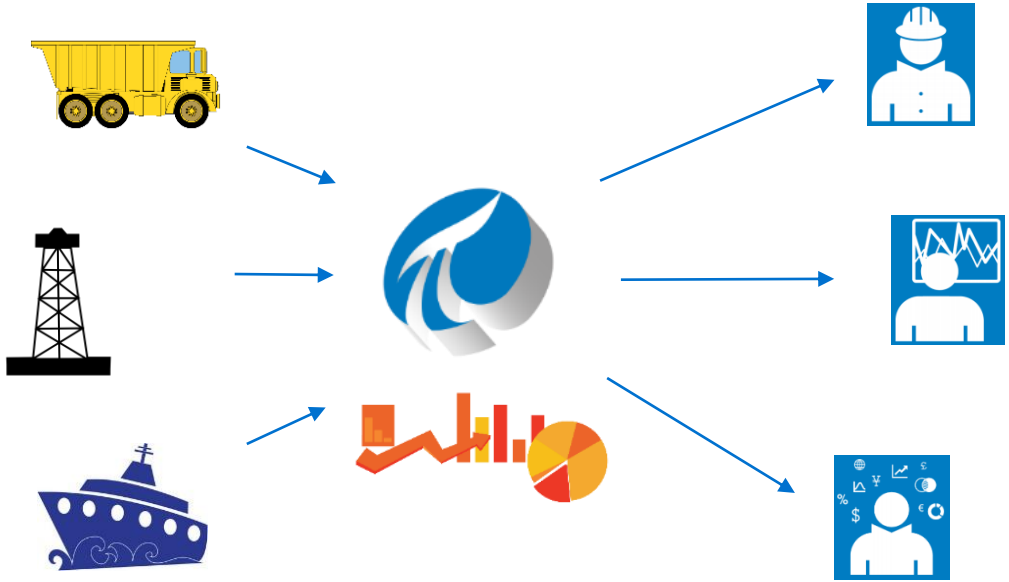
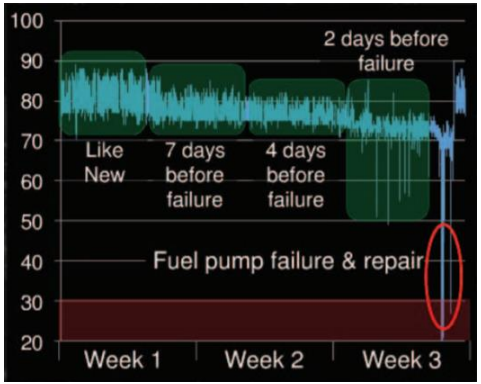
Engineering Trends: Data-Driven Systems





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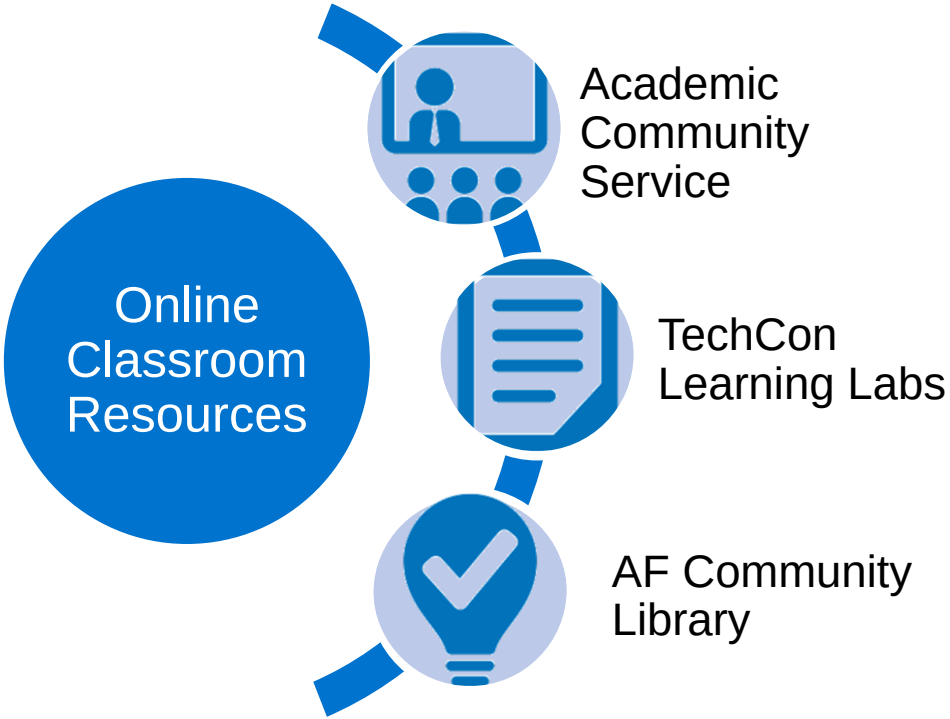
Transform Your Classroom



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Academic Community Service

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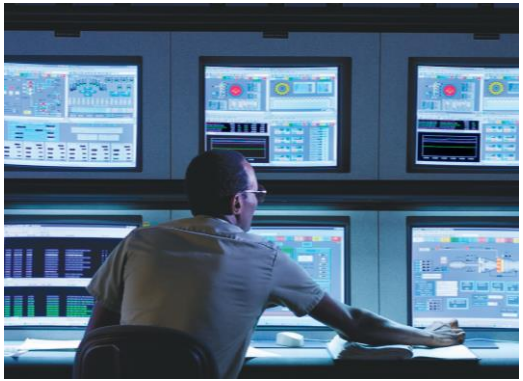
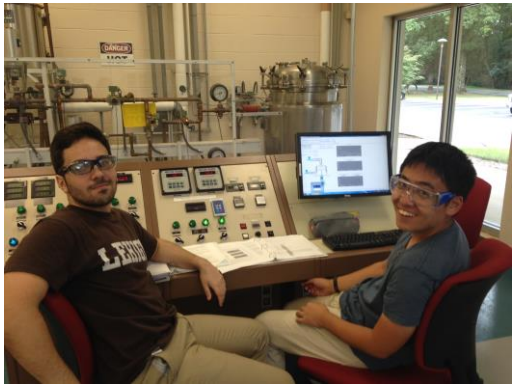
Prepare students for a career in industry

- Example: A *data-driven* approach to ChE Unit Operations
  - Bridge the gap between chemical engineering theory and practice
  - Students learn to work with complex, real-world data using the *process information system* that they will encounter in industry





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Announcing: Academic Community Service

- A shared, cloud-based PI System to support **classroom initiatives**
  - Minimal on-campus footprint
  - Data is written to PI via NI LabVIEW
  - Web-based data-visualization and access tools
  - No-hassle data integration with tools including MATLAB, R, and Python

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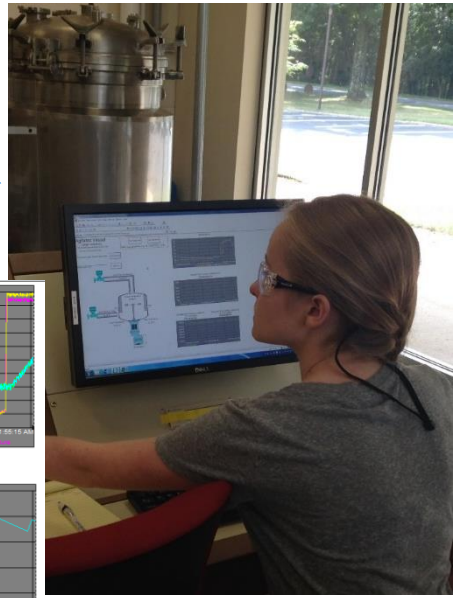
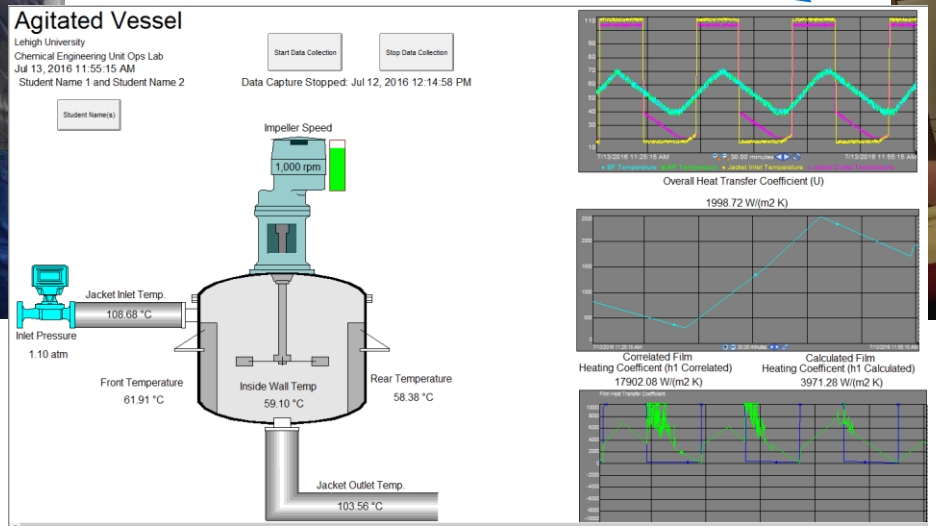
Example: Agitated Vessel Heat Transfer at Lehigh University

Academic Community Service
(Hosted by OSIsoft)





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TechCon Learning Labs

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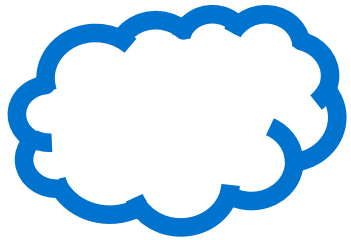
Our TechCon Learning Labs

- Applied learning labs shared at OSIsoft Users Conferences
  - Developed training documents
  - Cloud-based learning environment
  - Include use of advanced tools for data science like R Framework, Azure Machine Learning, Power BI, Esri ArcGIS



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End-to-End Exercises

- Provide time-series datasets with asset context
- Motivated by industry need
  - Predictive maintenance – equipment failure
  - Predicting hourly energy usage – facility/building
- Well-defined problem with clear objectives
- Defined solutions

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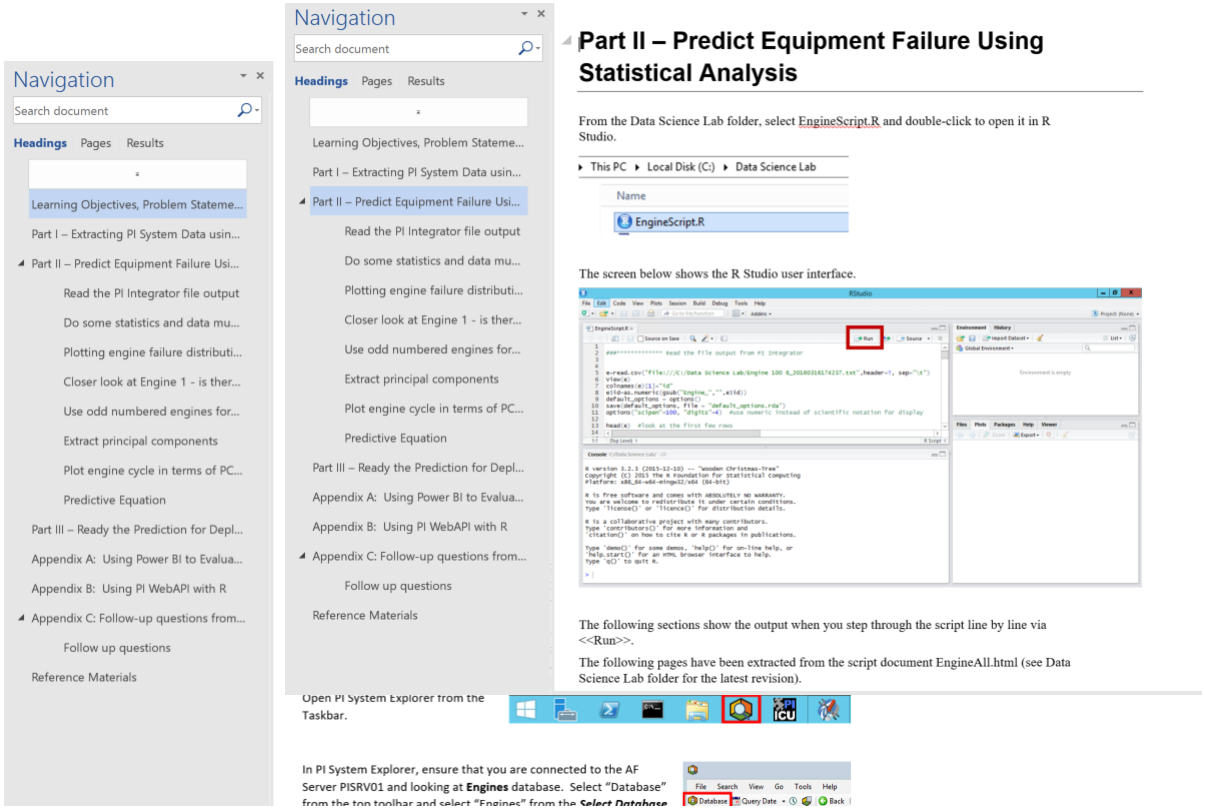
TechCon Workbooks



- Introductory information, exercises, walkthrough, and solutions

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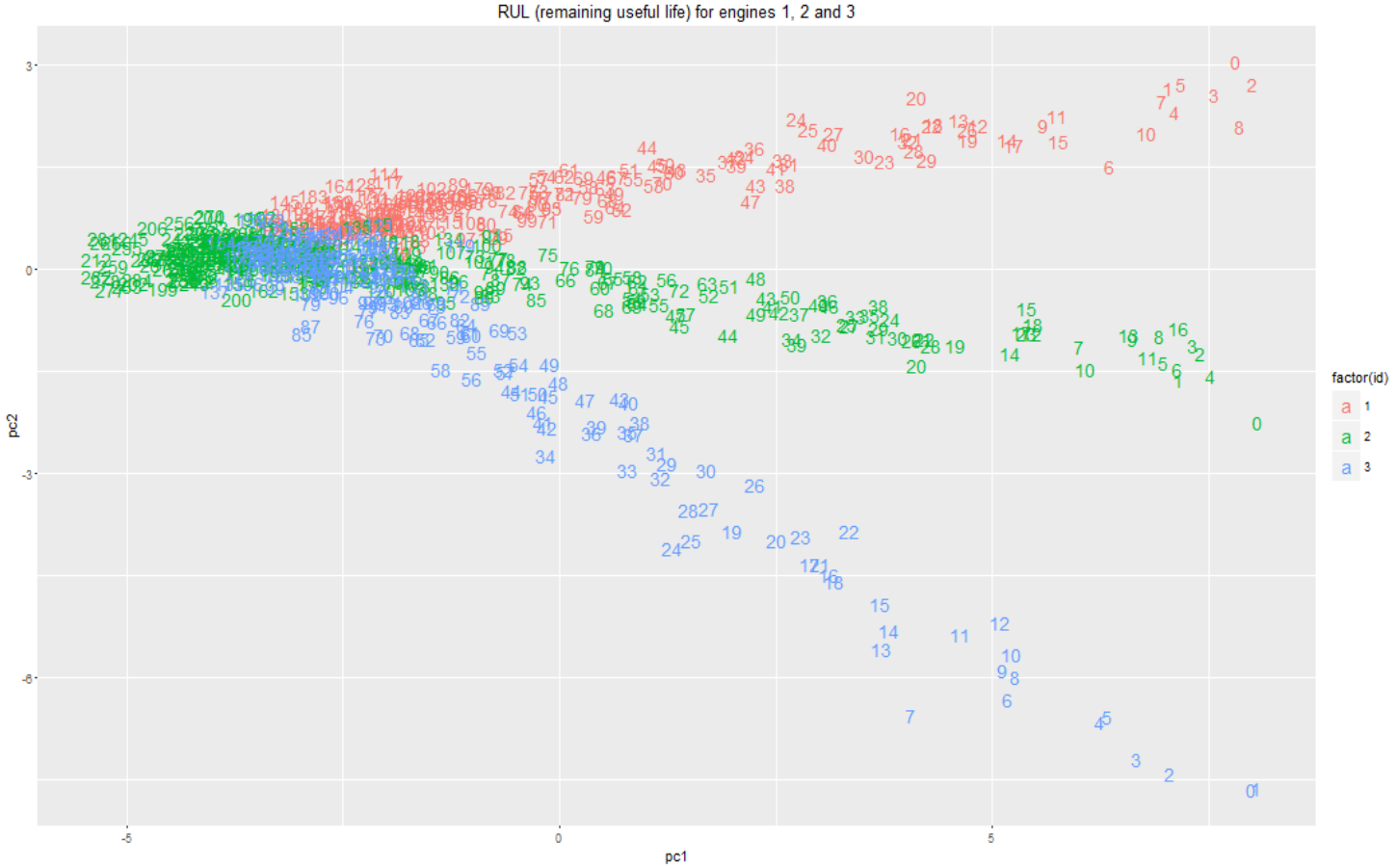
Engine data and analysis

	A	B	C	D	
1	id	cycle	setting1	setting2	set
2	1	1	-0.0007	-0.0004	
3	1	2	0.0019	-0.0003	
4	1	3	-0.0043	0.0003	
5	1	4	0.0007	0	
6	1	5	-0.0019	-0.0002	
190	1	189	-0.0006	0.0002	
191	1	190	-0.0027	0.0001	
192	1	191	0	-0.0004	
193	1	192	0.0009	0	
194	2	1	-0.0018	0.0006	
195	2	2	0.0043	-0.0003	
196	2	3	0.0018	0.0003	
197	2	4	0.0035	-0.0004	

	A	B	C	D	
1	id	cycle	setting1	setting2	s
2	1	1	-0.0007	-0.0004	
3	1	2	0.0019	-0.0003	
4	1	3	-0.0043	0.0003	
5	1	4	0.0007	0	
6	1	5	-0.0019	-0.0002	
20625	100	193	-0.0001	0.0002	
20626	100	194	-0.0011	0.0003	
20627	100	195	-0.0002	-0.0001	
20628	100	196	-0.0004	-0.0003	
20629	100	197	-0.0016	-0.0005	
20630	100	198	0.0004	0	
20631	100	199	-0.0011	0.0003	
20632	100	200	-0.0032	-0.0005	



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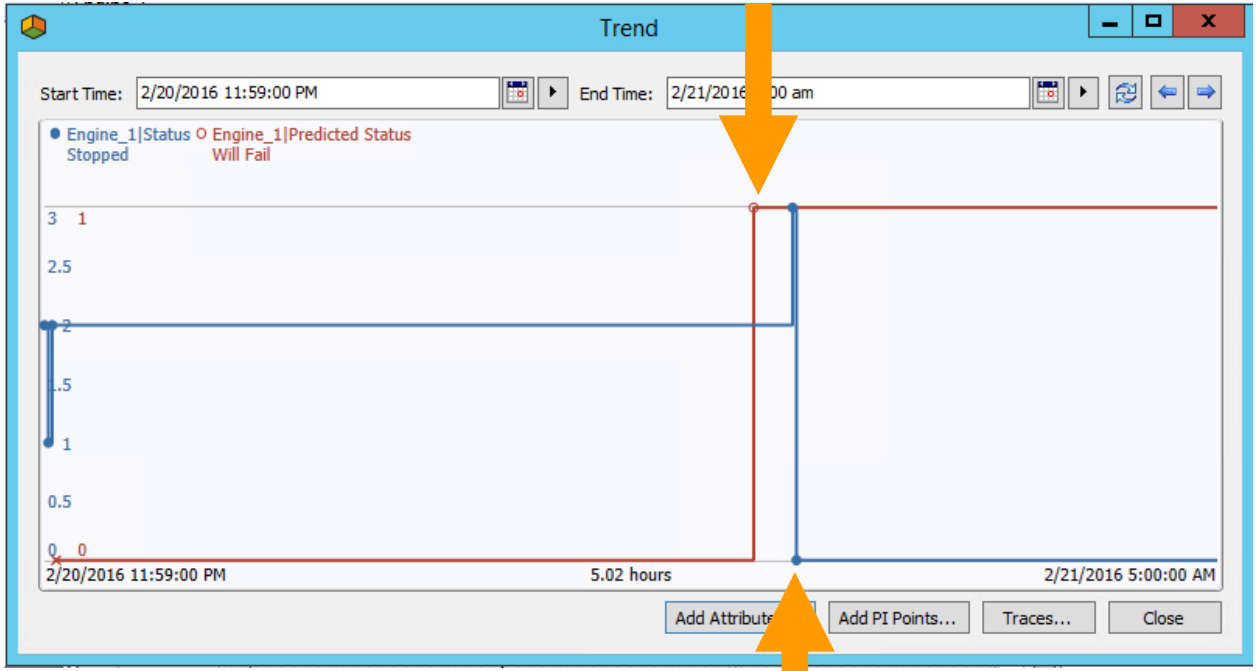
Real-time engine failure prediction

Engine Failure Predicted



Engine Fails

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Popular TechCon Learning Labs

- Condition Based Maintenance
- Apply Data Science with Machine Learning
- Geospatial Analysis in Real Time
- Using Forecast Data with the PI System
- Modeling Your Process
- Building Applications with PI Web API
- Detect and Track Important Events
- Developing Cross-Platform Mobile Apps

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Community Library

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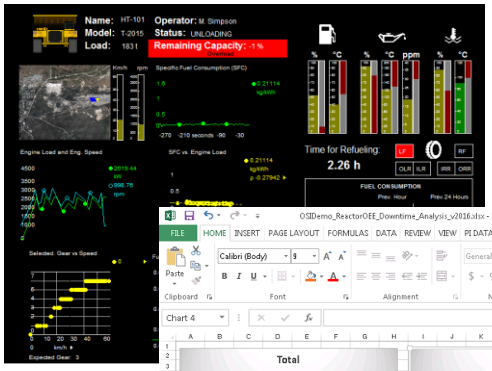
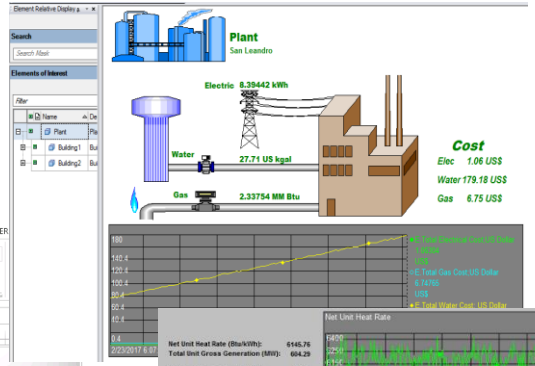
Growing resource library for examples and templates

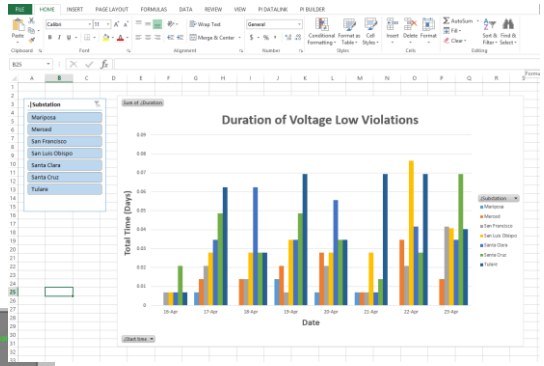
Mobile asset monitoring

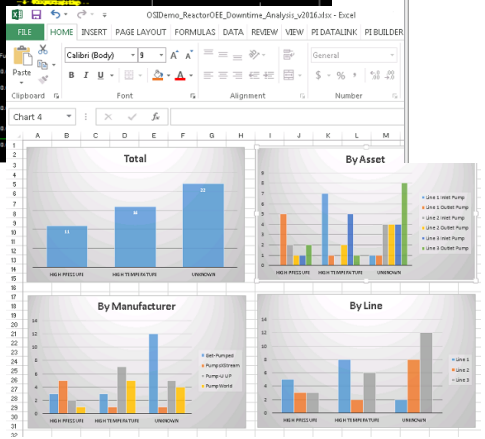


Utilities cost management

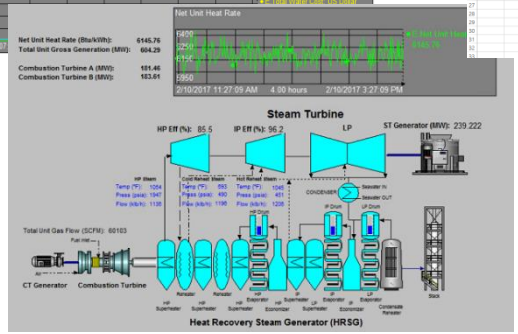


Feeder voltage excursions





Reactor OEE



Turbine efficiency

….And many more!

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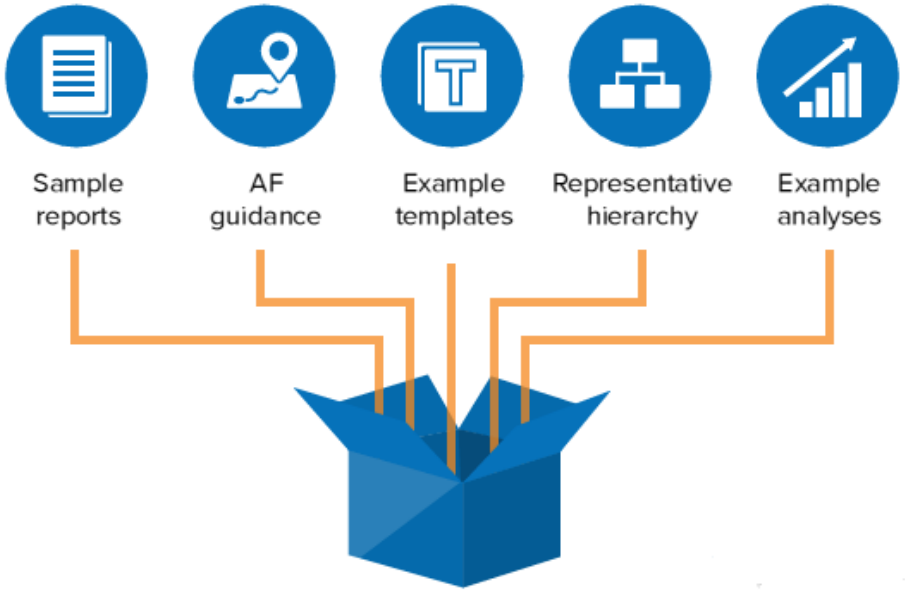
Asset Based PI Example Kits

- *Explore how business initiatives take shape.*



- Learning tool & starting point
- Installed on Academic Community Service
- Includes simulated data
- Available to everyone in the **AF Community Library** on PI Square

https://pisquare.osisoft.com/community/all-things-pi/af-library

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On-Premises PI System

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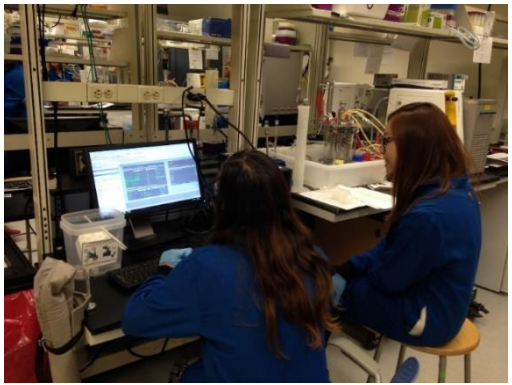
On-Premises PI Systems

- Best choice for complex implementations or research-level data
- OSIsoft provides training credits for system admins



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Call to action – Come talk to us!

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감사합니다

Danke

谢谢

Merci

Gracias

Thank You

ありがとう

Спасибо

Obrigado

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