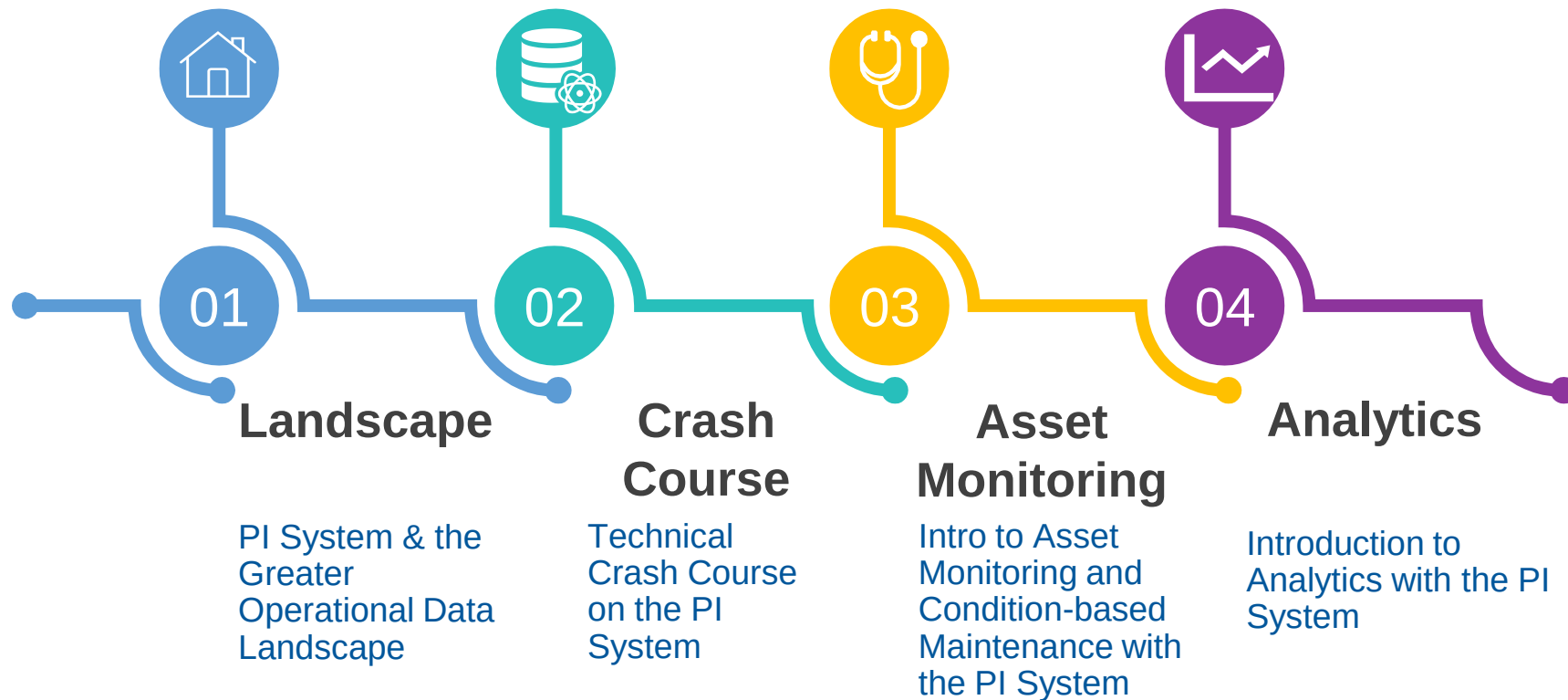


Technical Crash Course on the PI System

Jason Johl
Product Marketing Manager

Where are we in the PI System Introduction



You might be wondering...



What can I do with the PI System?



How to describe the PI System to my coworkers back at the office?



What PI System Tools should I focus on?



How to navigate PI World 2019?

What can I do with  ?

Asset Health



Process Optimization



Quality Tracking



Energy Efficiency



Regulatory Compliance



Safety & Security



Asset Health



Problem

Wind Farm can't meet generation targets

Why?

Wind Turbine availability is low due to curtailment and unplanned downtime

Target

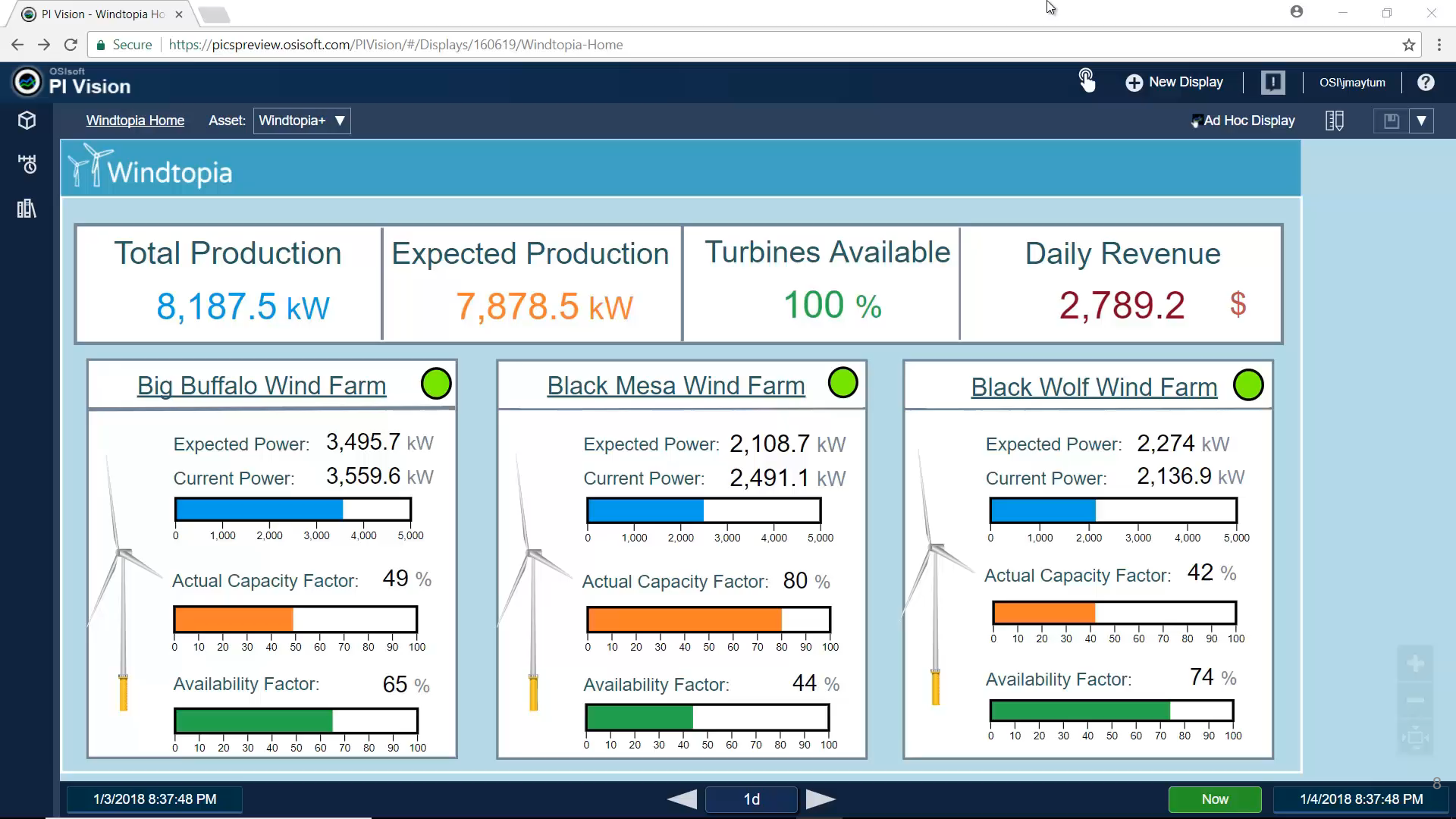
Increase Wind Turbine availability to 95%

How?

Find biggest cause of lost production



**Let's see the PI System
IN ACTION!**





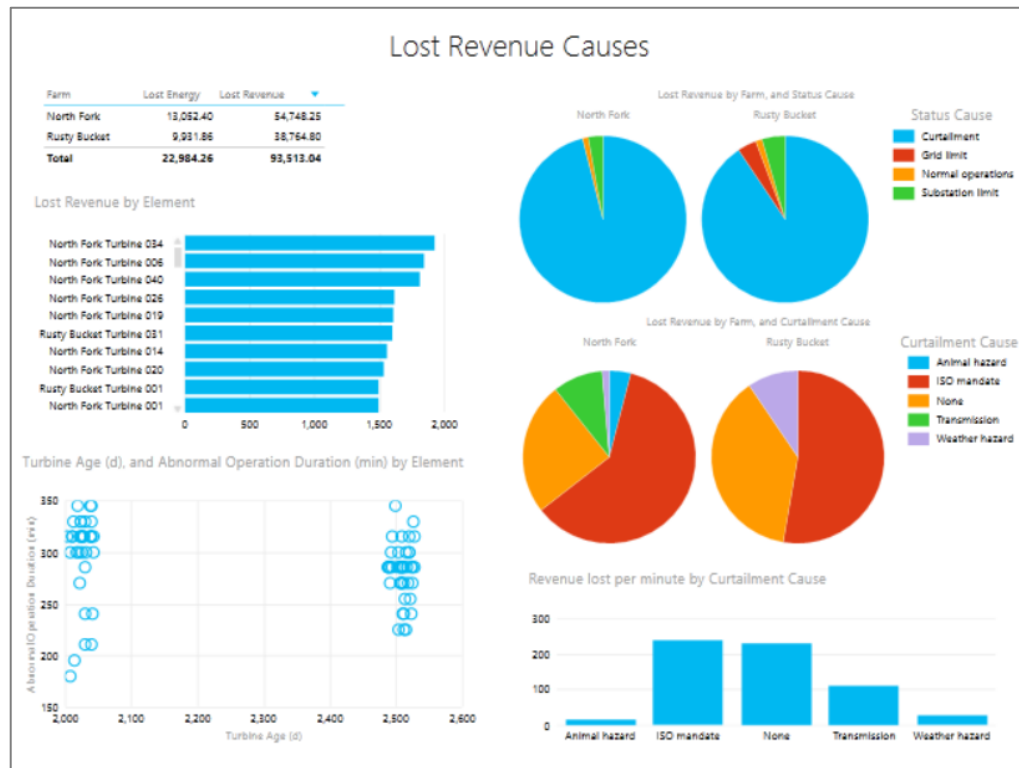
How to describe the PI System?

Let's compare creating this
report

Without the PI System

and

With the PI System

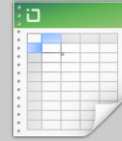


Without the PI System

Corporate



Lost Production

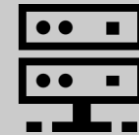


North Fork



SCADA 1

Springfield

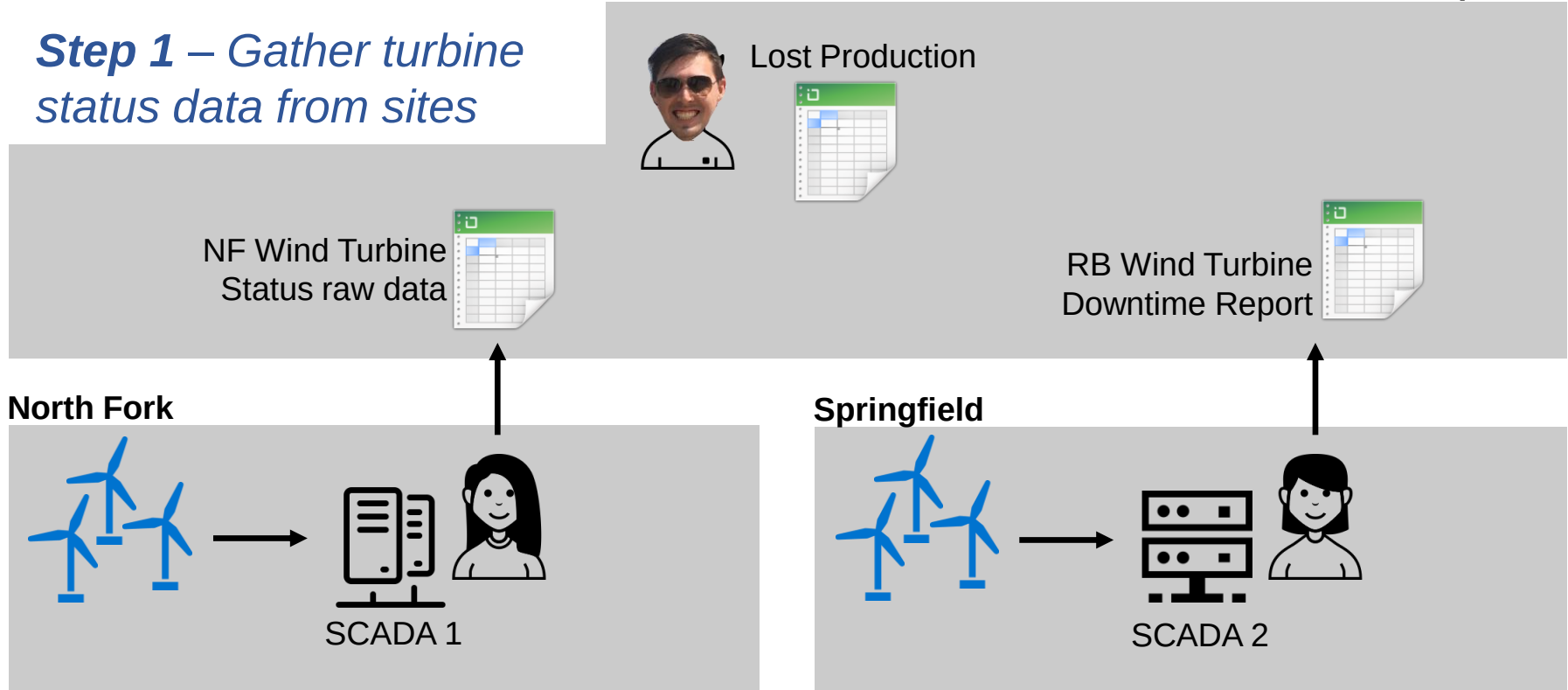


SCADA 2

Without the PI System

Corporate

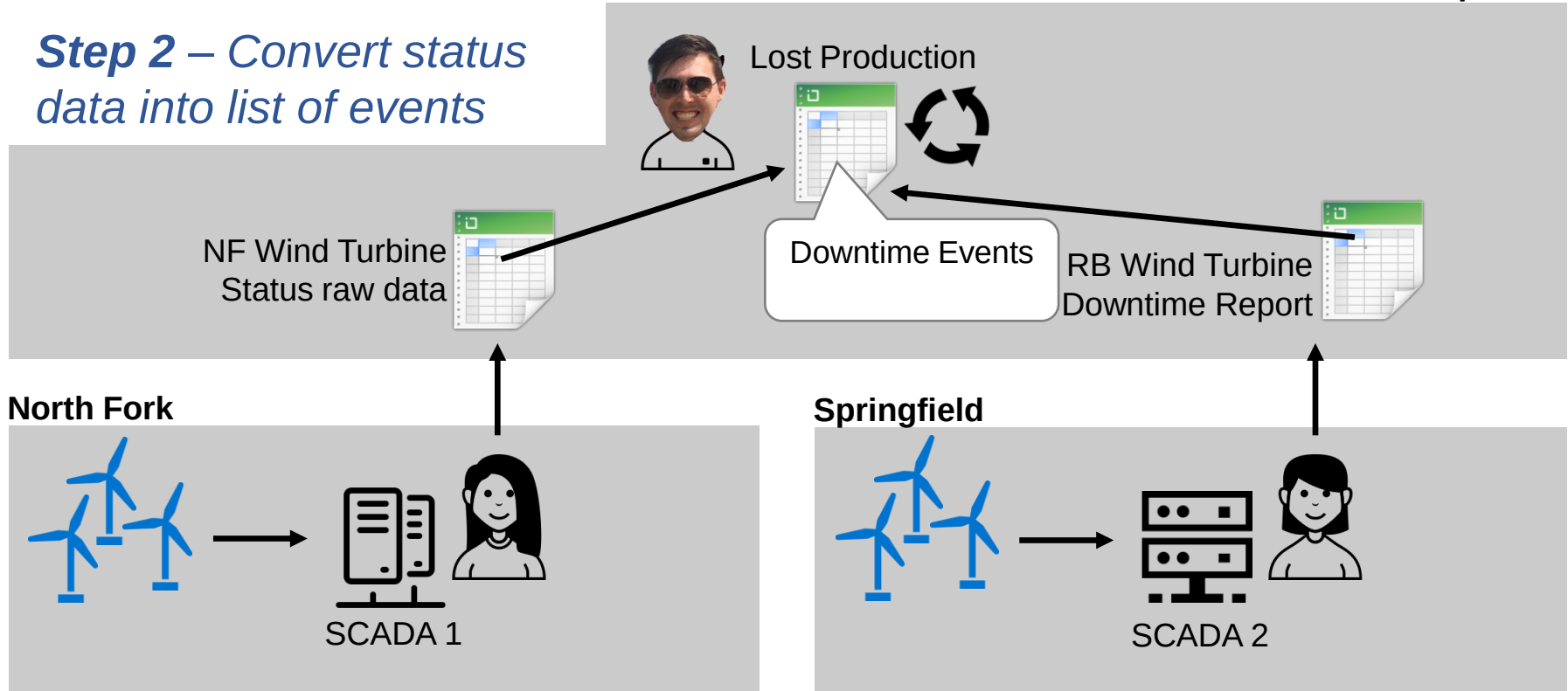
Step 1 – Gather turbine status data from sites



Without the PI System

Corporate

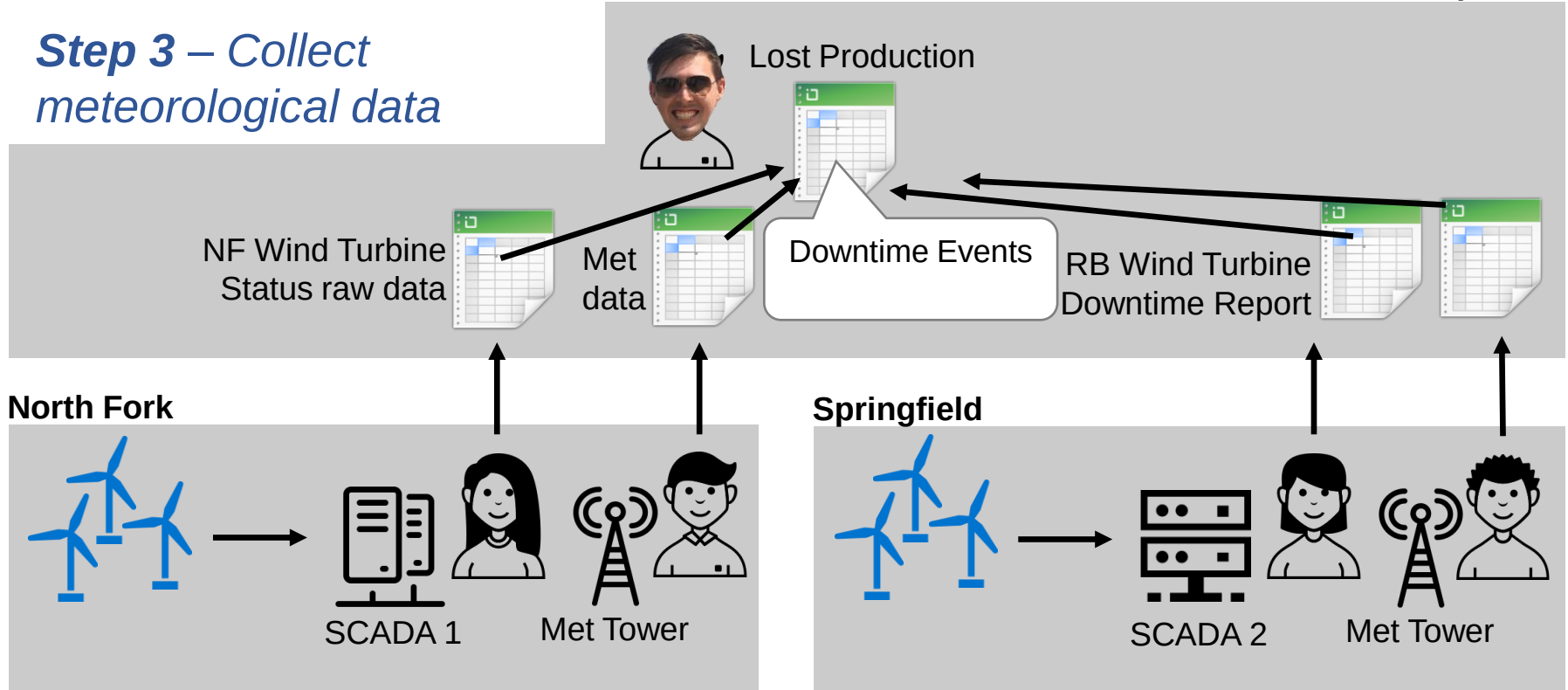
Step 2 – Convert status data into list of events



Without the PI System

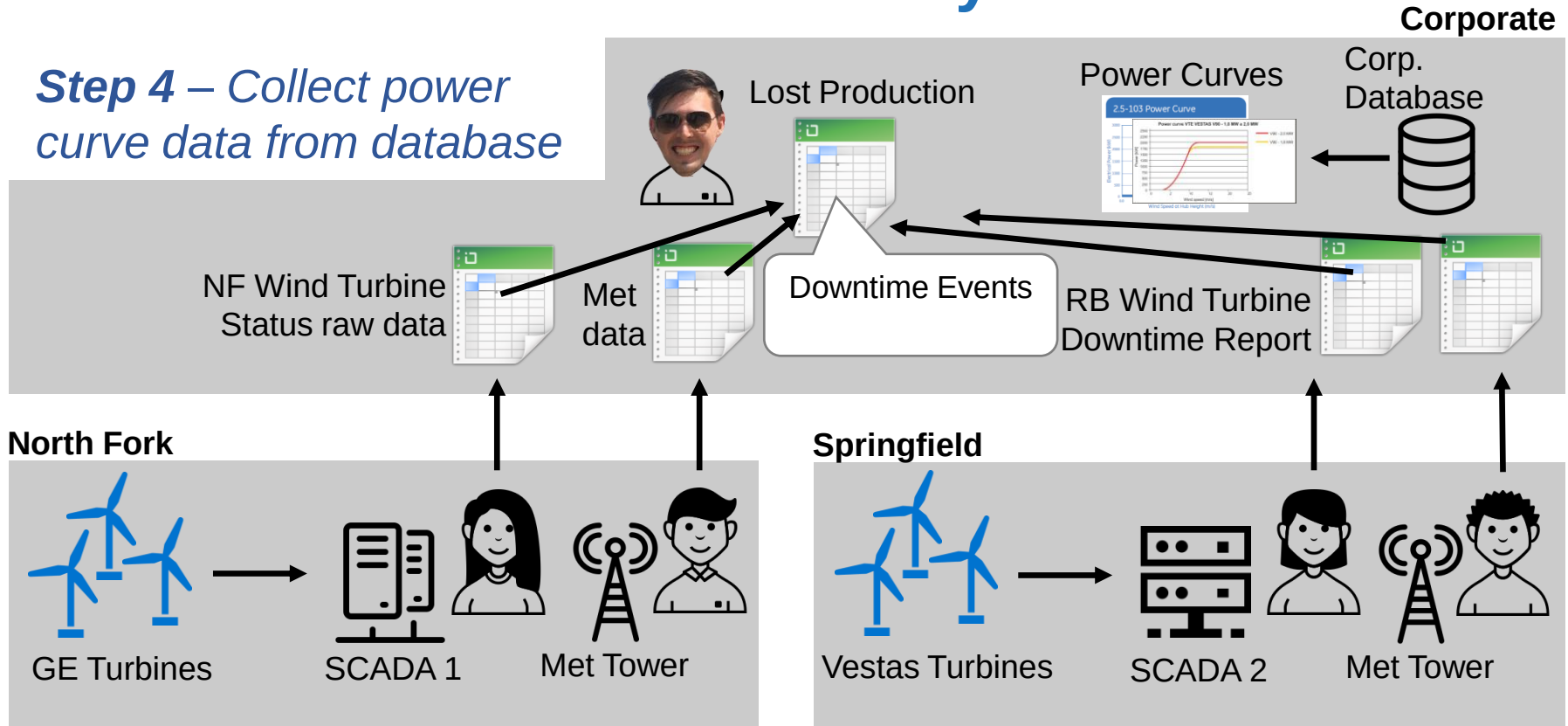
Corporate

Step 3 – Collect meteorological data



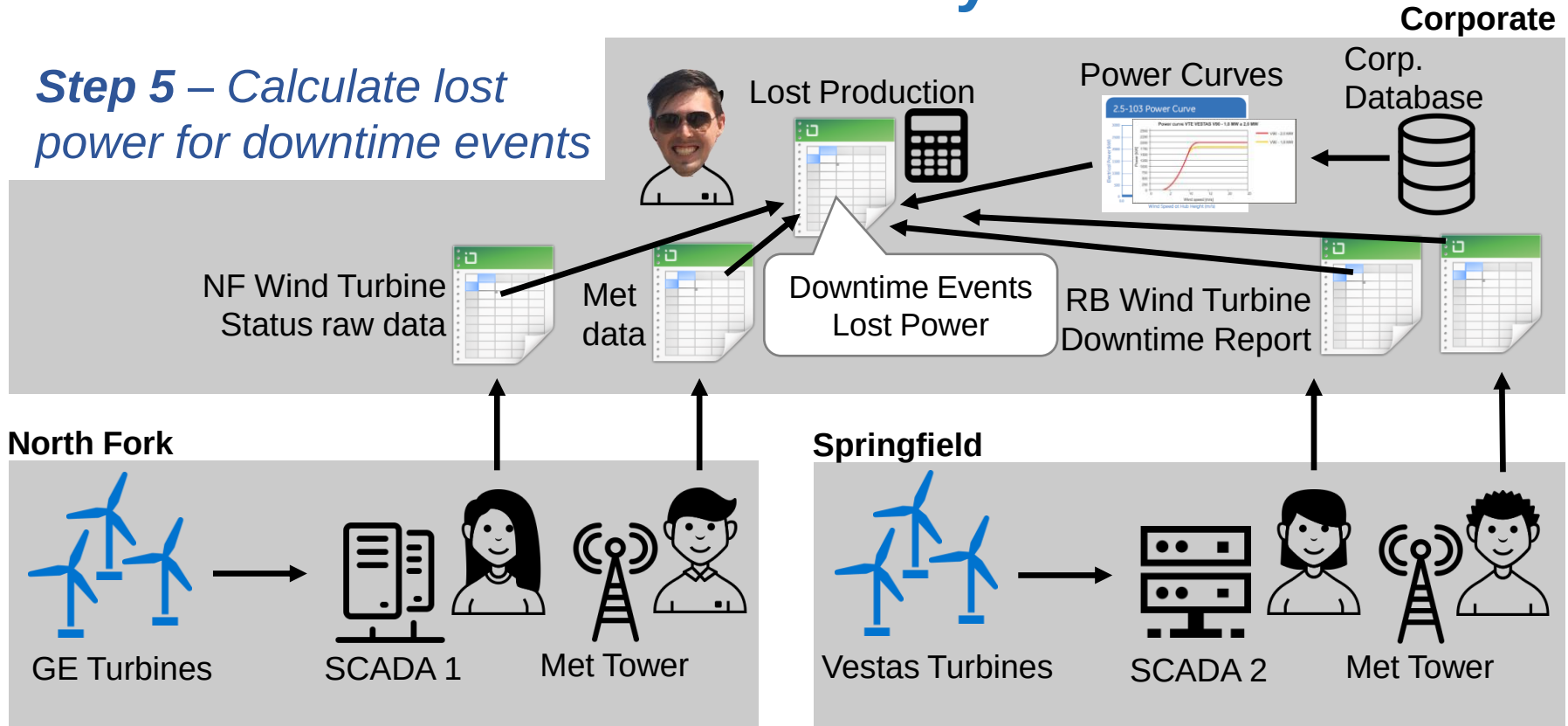
Without the PI System

Step 4 – Collect power curve data from database



Without the PI System

Step 5 – Calculate lost power for downtime events



Without the PI System

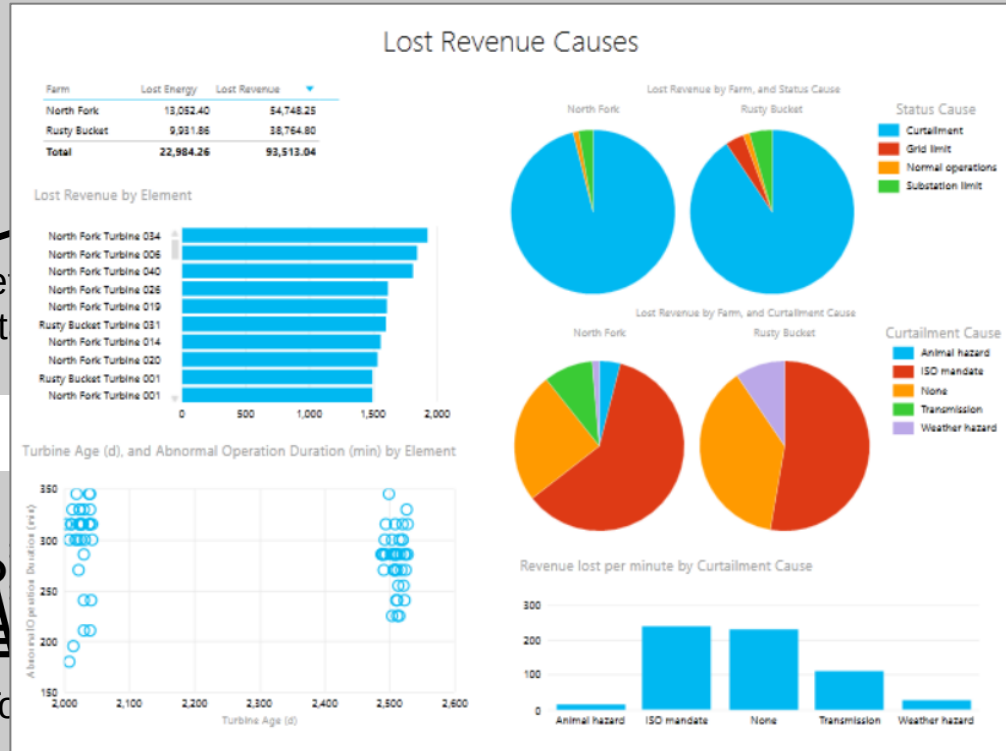
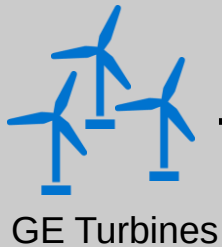
Corporate

Step 6 – Publish the report!

NF Wind Turbine
Status raw data

Metadata

North Fork



Without the PI System

Corporate

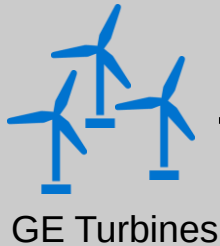
Step 6 – Publish the report!
... then start over next week

NF Wind Turbine
Status raw data



Metadata

North Fork



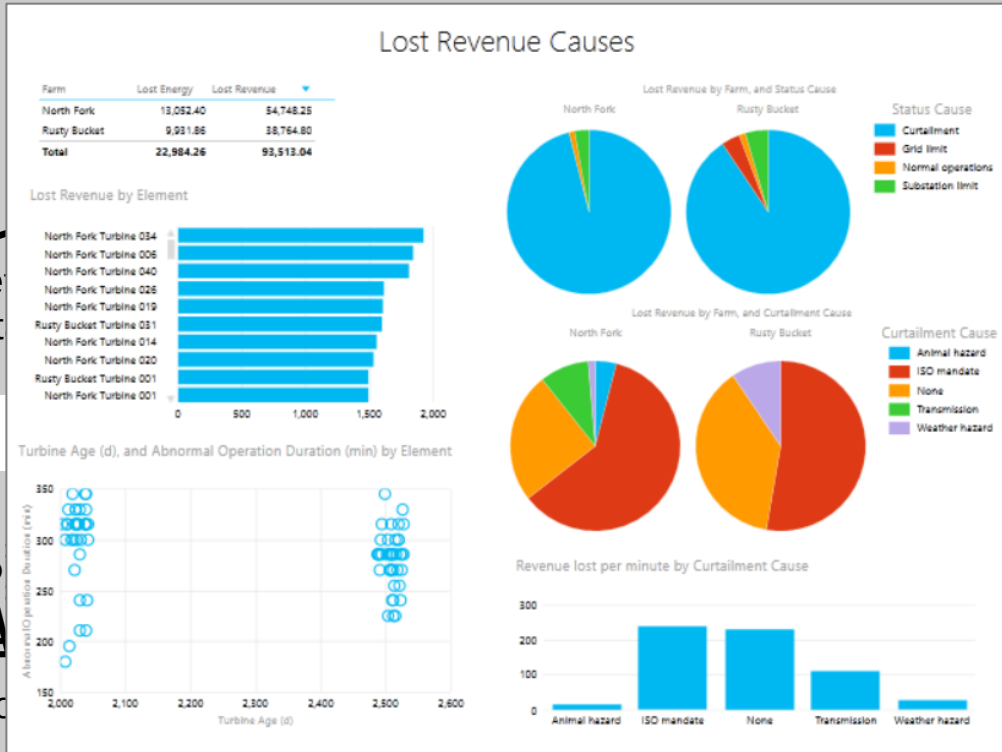
GE Turbines



SCADA 1

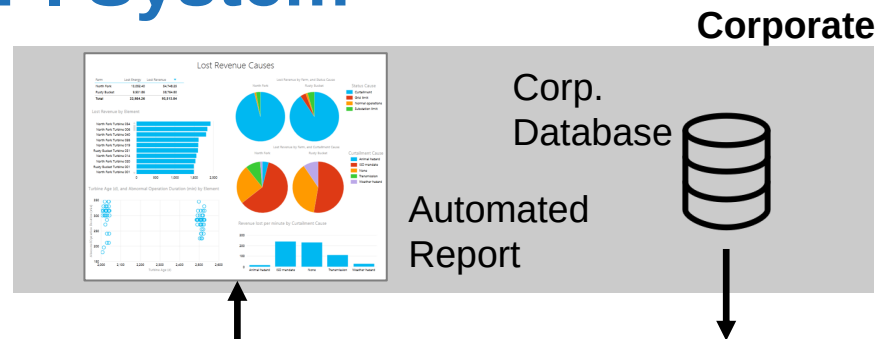


Met Tower



With the PI System

Site operations data collection
External database integration
Real-time analytics and events
Automated BI reporting



OSIsoft®

PI System Infrastructure

North Fork



GE Turbines



SCADA 1



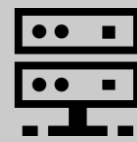
Met Tower



Rusty Bucket



Vestas Turbines



SCADA 2



Met Tower





What PI System tools do I need?

What type of solution are you looking for?

- **Collect Data from Disparate Systems**
- **Create Calculations for Assets**
- **Identify and Capture Important Events**
- **Visualize and Share Data**
- **Deploy Business Intelligence (BI) & Machine Learning**

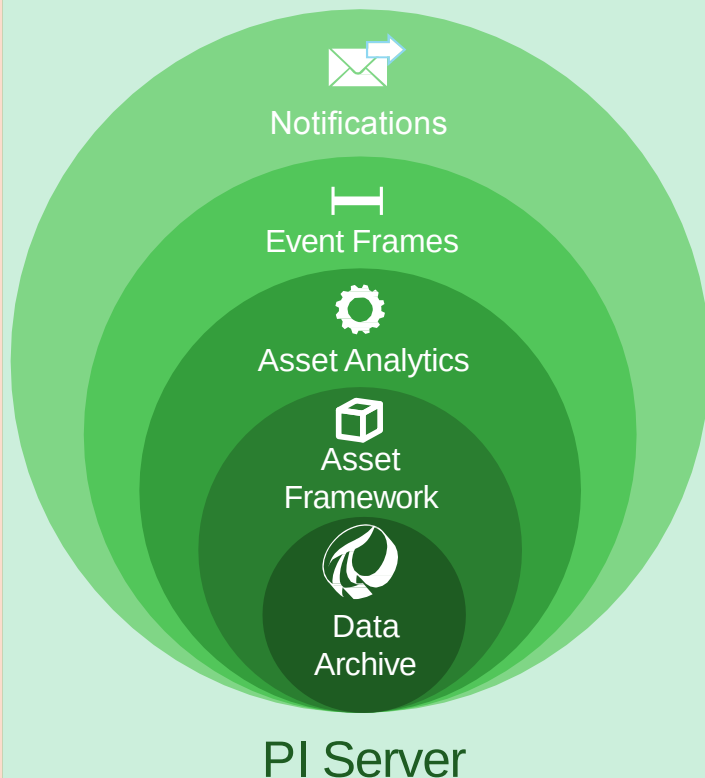
Collect

Data Sources

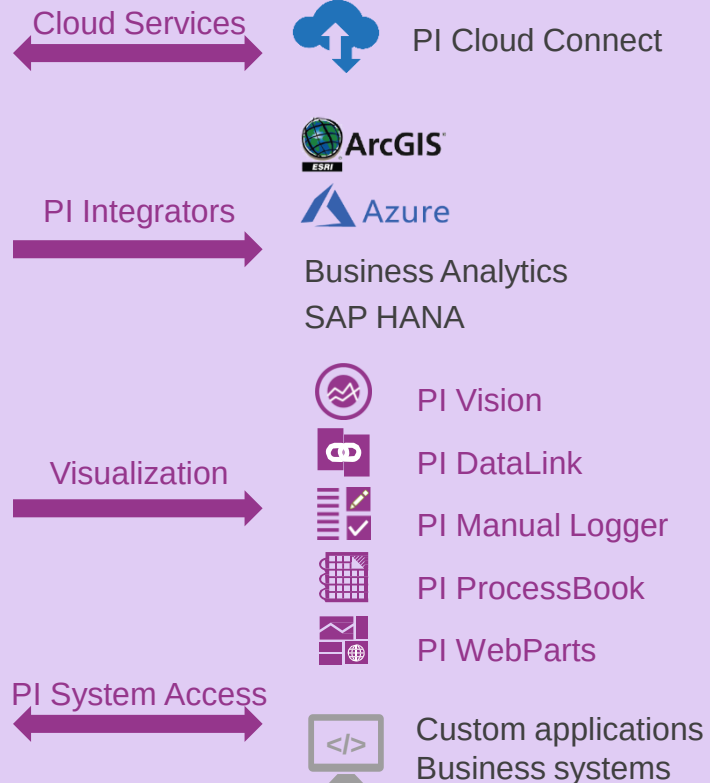


PI Interfaces
&
PI Connectors

Store & Enhance



Deliver

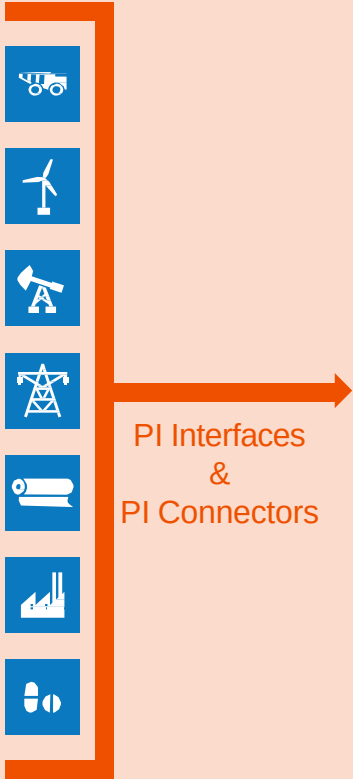


Collect Data from Disparate Systems

“PI Connectors & PI Interfaces”

Collect

Data Sources



PI Interfaces
&
PI Connectors

Collects **time-series** and **meta-data** from any source



IoT Sensors



Databases



We have developed over **450** PI Interfaces and PI Connectors

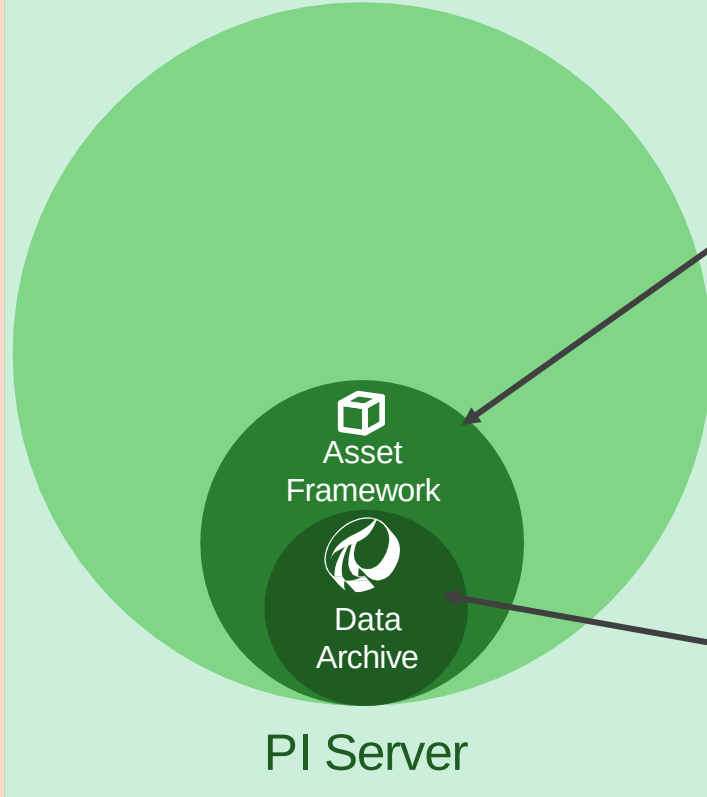
Collect

Data Sources



PI Interfaces
&
PI Connectors

Store & Enhance



Meta-data stored in the
Asset Framework

-  Manufacturer
-  Longitude
-  Latitude

Raw time-series data is stored
in the **Data Archive**

-  Turbine Status ON
-  Active Power 317
-  Nacelle Position 304

Create Calculations for Assets

“Asset Framework & Asset Analytics”

Collect

Data Sources

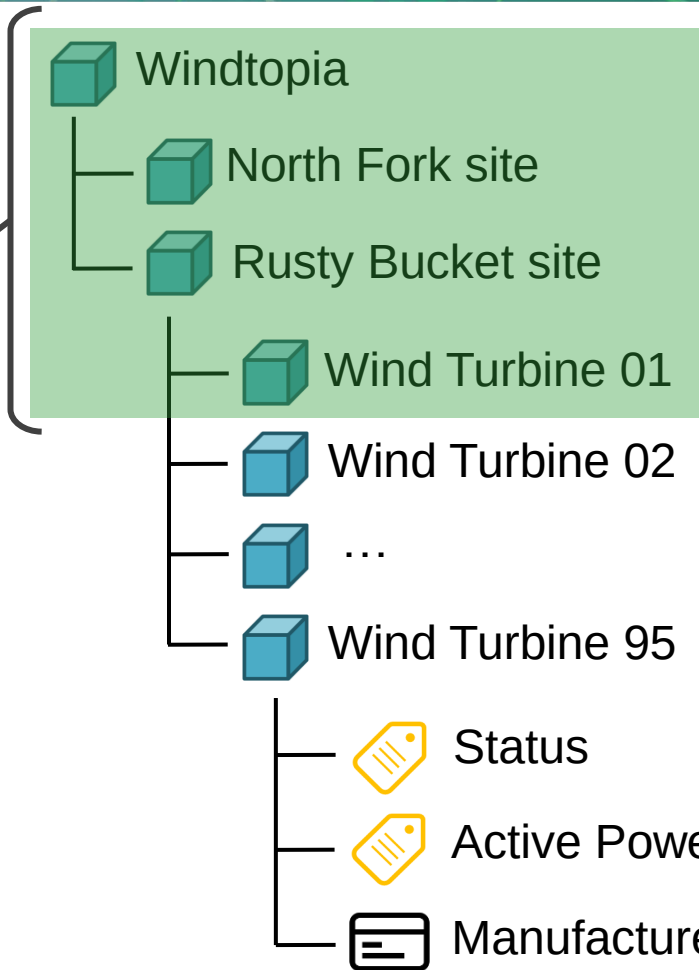
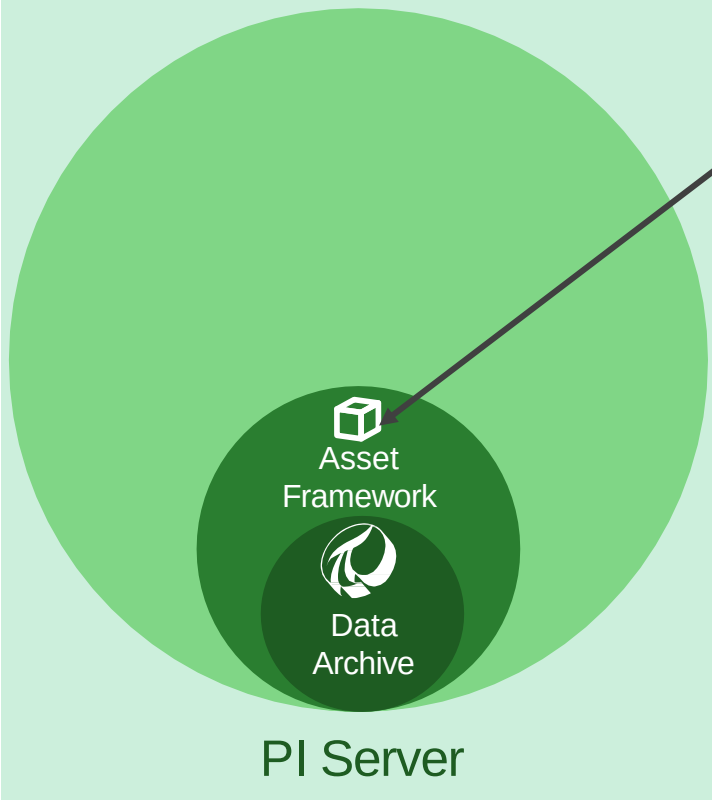


PI Interfaces
&
PI Connectors

Store & Enhance

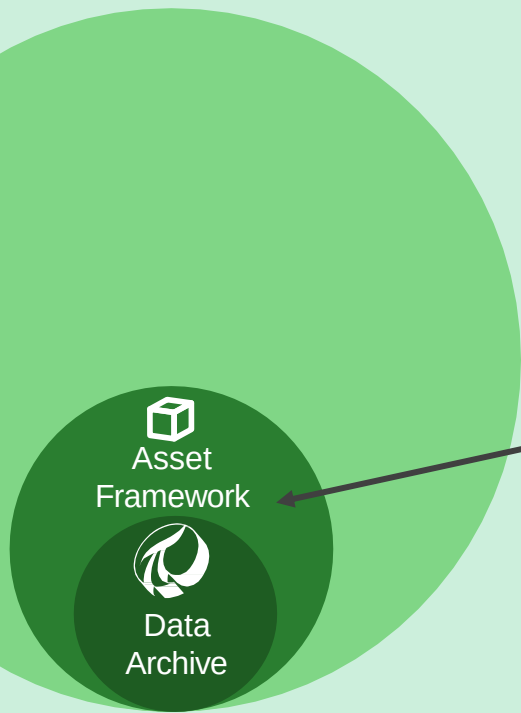


Store & Enhance

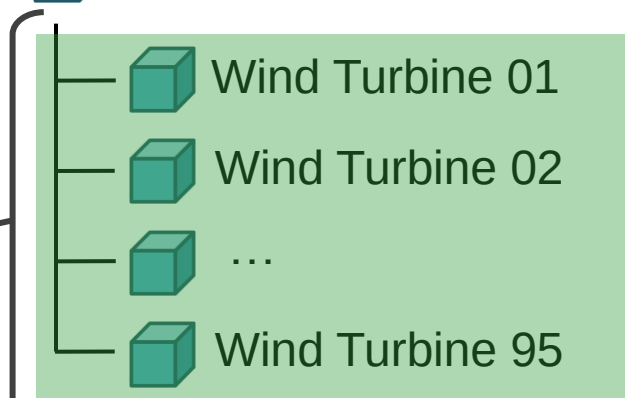


Build **relationships** between assets

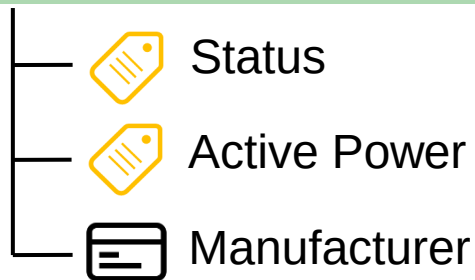
Store & Enhance



PI Server



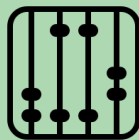
Build **templates** for common assets



Store & Enhance



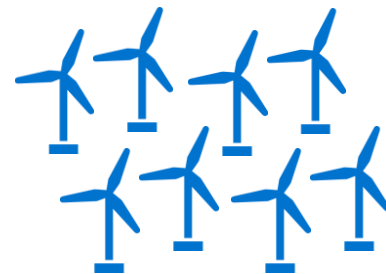
Wind Turbine Template



Hourly Energy Production
Power Factor

Build real-time
analytics on
templates...

... deploy them
to your entire
fleet...



North Fork site



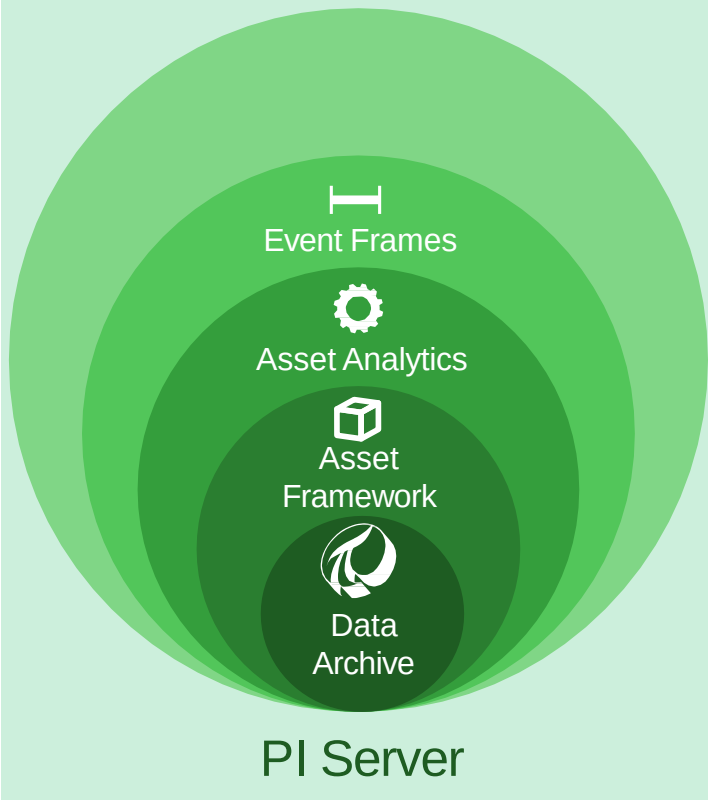
Total Energy Production
Average Power Factor

... and roll it
up to the site

Identify and Capture Important Events

“Asset Framework & Event Frames”

Store & Enhance



Store event context

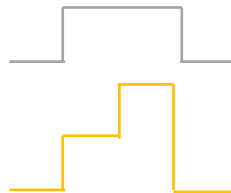
 Gearbox overheating

 Downtime

 Turbine Curtailment

Triggers:

User Defined



External Systems



Store & Enhance


Notifications


Event Frames


Asset Analytics


Asset
Framework

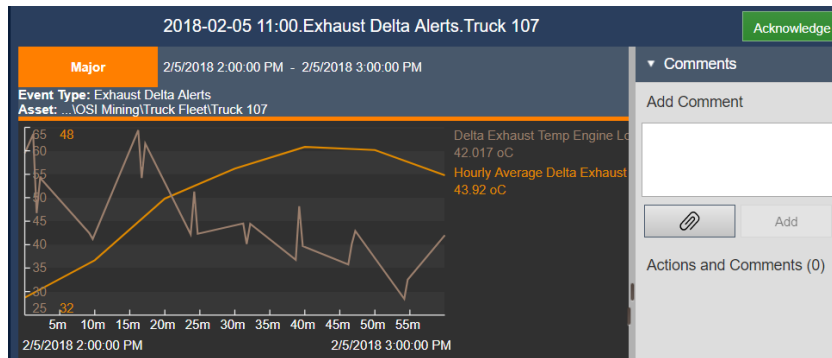

Data
Archive

PI Server

Notification on important events

 Gearbox overheating

 Notification

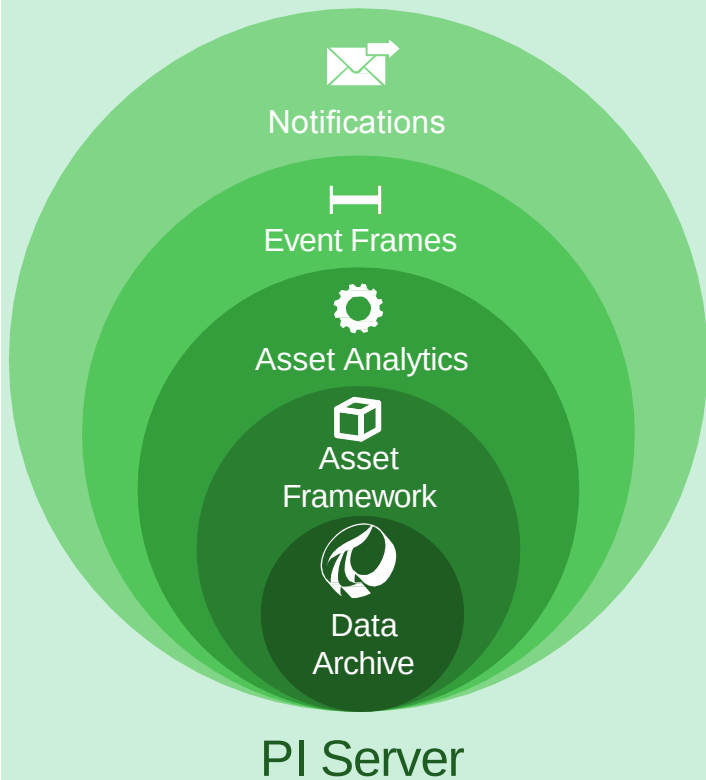


Operator can **view**, **acknowledge**
and **comment** on event

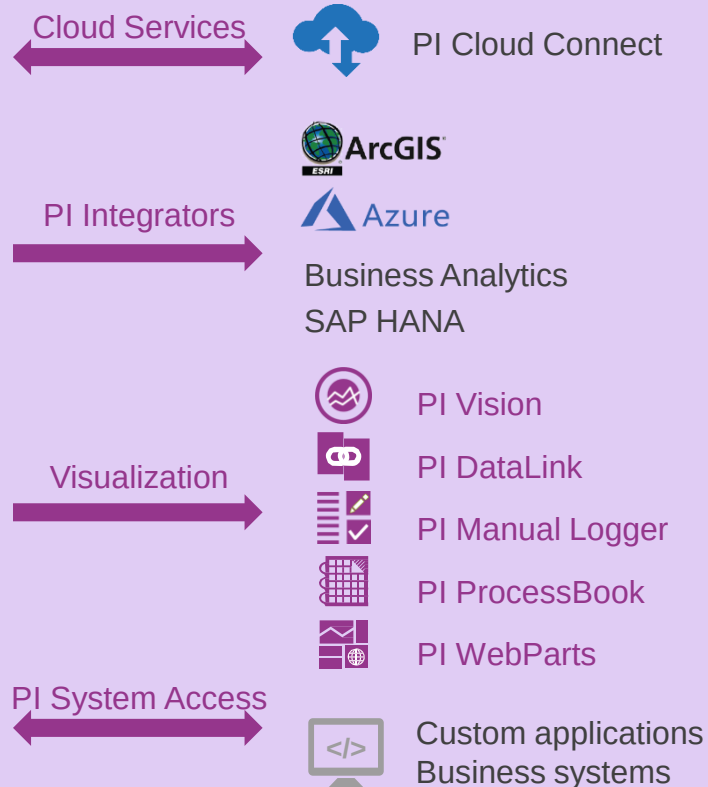
Visualize and Share Data

“PI Vision & PI DataLink”

Store & Enhance



Deliver





PI System's flagship visualization tool

Designed with collaboration in mind
Display editing and visualization
Use any device
Extensible



Deliver

Cloud Services



PI Cloud Connect



PI Integrators

Business Analytics
SAP HANA

Visualization



PI Vision



PI DataLink



PI Manual Logger



PI ProcessBook



PI WebParts

PI System Access



Custom applications
Business systems

PI DataLink

	A	B	C	D	E	F
1	 company name					
2		Area		Line 1		
3	From	Unit		Injection Mold 1		
4	05/23/2017 00:00:00	Target	Production	Scrap	Scrap	Average Temperature
5	To	Count	Count	Count	%	F
6	05/24/2017 00:00:00					
7	0:00	580	560	40	7.14%	459.89
8	1:00	500	502	29	5.78%	459.77
9	2:00	580	573	27	4.71%	460.10
10	3:00	580	572	28	4.90%	460.54
11	4:00	580	571	29	5.08%	460.04
12	5:00	580	574	26	4.53%	460.08
13	6:00	500	466	40	8.58%	460.25
14	7:00	580	572	28	4.90%	460.08
15	8:00	500	490	22	4.49%	459.53
16	9:00	580	574	26	4.53%	460.58
17	10:00	500	250	132	50.97%	429.49
18	11:00	580	303	87	28.71%	429.61
19	12:00	580	312	87	27.88%	430.62
20	13:00	500	236	129	54.66%	430.14
21	14:00	580	290	93	32.07%	429.97
22	15:00	580	435	62	14.25%	444.72
23	16:00	580	578	25	4.35%	460.78
24	17:00	580	570	30	5.26%	459.75
25	18:00	580	574	26	4.53%	459.83
26	19:00	580	576	24	4.17%	459.84
27	20:00	500	437	20	4.58%	460.35
28	21:00	580	307	76	24.76%	429.87
29	22:00	580	572	28	4.90%	459.47
30	23:00	580	568	32	5.63%	459.73

PI System data in Microsoft Excel

Pull in raw data, calculations, events, filtered data
Leverage Excel functionalities
Automated reporting

Deliver

Cloud Services



PI Cloud Connect



PI Integrators



Business Analytics
SAP HANA

Visualization



PI Vision



PI DataLink



PI Manual Logger



PI ProcessBook



PI WebParts

PI System Access



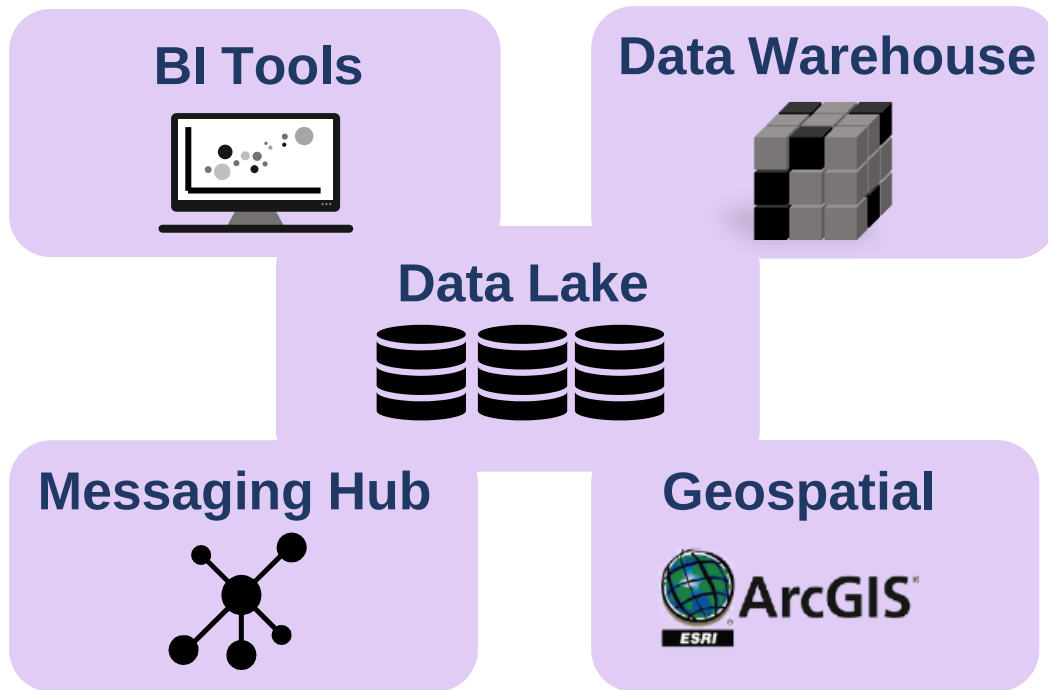
Custom applications
Business systems

Deploy Business Intelligence (BI) & Machine Learning

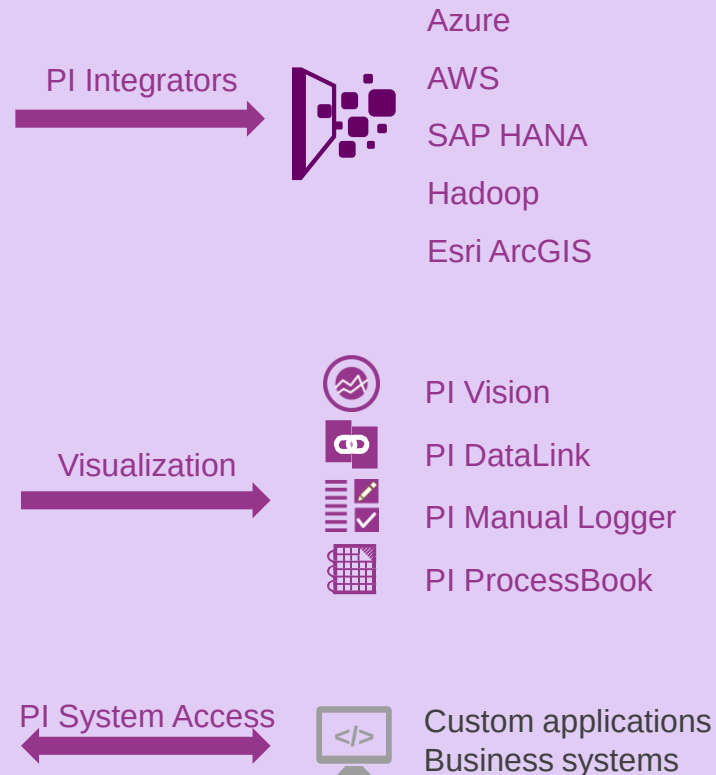
“PI Integrators”

PI Integrators

Prepare, clean and deliver PI System data to external systems



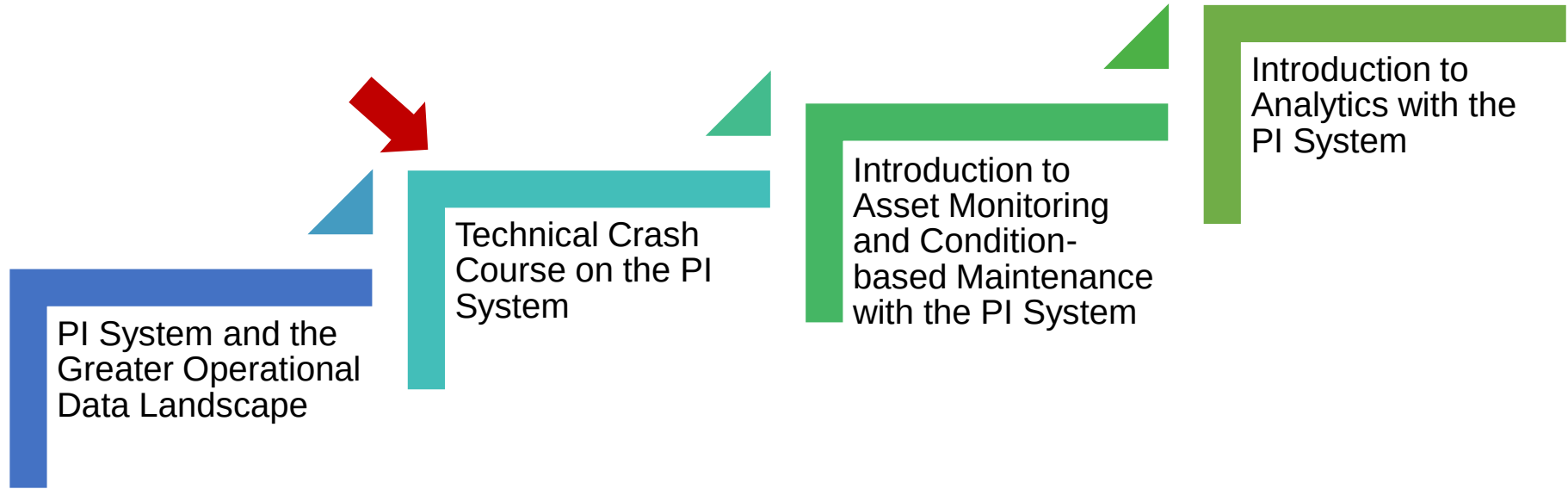
Deliver





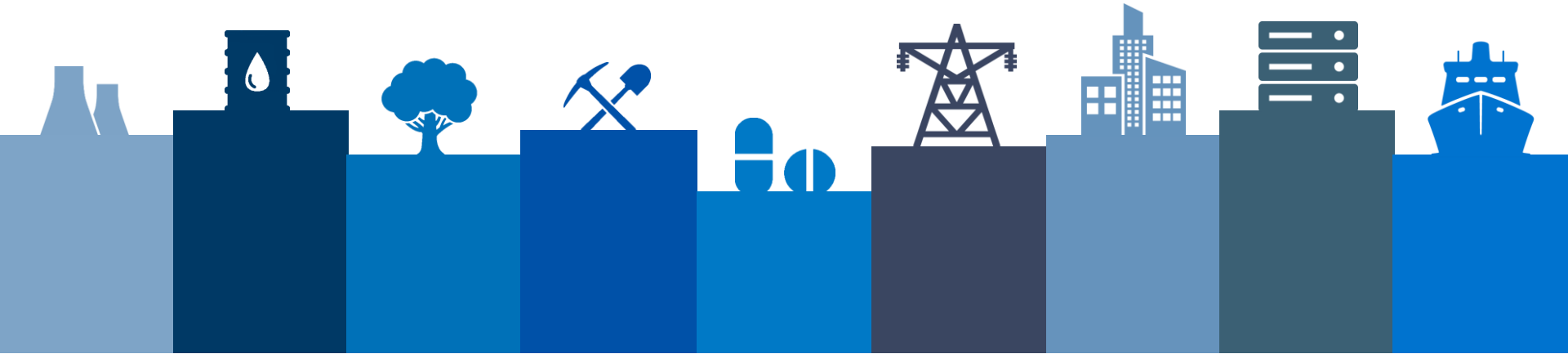
How to navigate PI World?

Day 1 - Introduction to the PI System Track



Day 2 – Industry Day: Get Inspired!

- ✓ Various Industry Tracks
- ✓ Industry User Group Meetings



Day 3 – Product Tracks & Labs

- ✓ Learn more about individual products
- ✓ Partner & product expo
- ✓ *Hands-on labs – registration required



Hands-On Labs

Register
Today



Contact Information



Jason Johl
Product Marketing Manager
OSIssoft
jjohl@osisoft.com

Questions?

Please wait for
the **microphone**

State your
name & company



Please remember

TO DOWNLOAD
APP, SEARCH
OSISOFT





Support Slide – IT Architecture