

The PI System in the Manufacturing Line – Calculating OEE Across Your Factory

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Gothenburg, 17th September 2019





Manufacturing Challenges

Manufacturing Challenges

Run Time

Uptime

Planned Downtime

Unplanned Downtime

Visibility

Reason Code

- Downtime
- Losses

Line/Plant Comparison

ROI Measurements

Throughput

Yield

Units produced

Speed

Scheduling

Product Changeover

Demand vs. Capacity

Slow Start-up

**No visibility on process
data in real-time**

**Failures every
few minutes**

Low product quality

Downtime reasons

Unable to collect MTBF

Downtime time-frames

**Unable to compare
equipment efficiencies**

Low line efficiencies

Lack of global OEE strategy!

A detailed view of a pharmaceutical manufacturing process. In the foreground, a row of brown glass vials is being filled by a machine. The vials are arranged in a line, and a metal nozzle is positioned above them. In the background, a large, white, industrial machine with various pipes and valves is visible. The machine is enclosed in a glass safety enclosure. The overall scene is brightly lit, typical of a cleanroom environment.

How OEE can help you?

What is Overall Equipment Efficiency (OEE)?

“Standard to measure manufacturing productivity that identifies the percentage of manufacturing time that is truly productive”

OEE

=

Availability

x

Performance

x

Quality

100% OEE

No Stop Time

As fast as possible

Good Parts Only

Running time



Running speed



Good Parts



Typical Losses



Availability

- Unplanned Stops → Equipment Failure
- Planned stops → Setup and adjustments



Performance

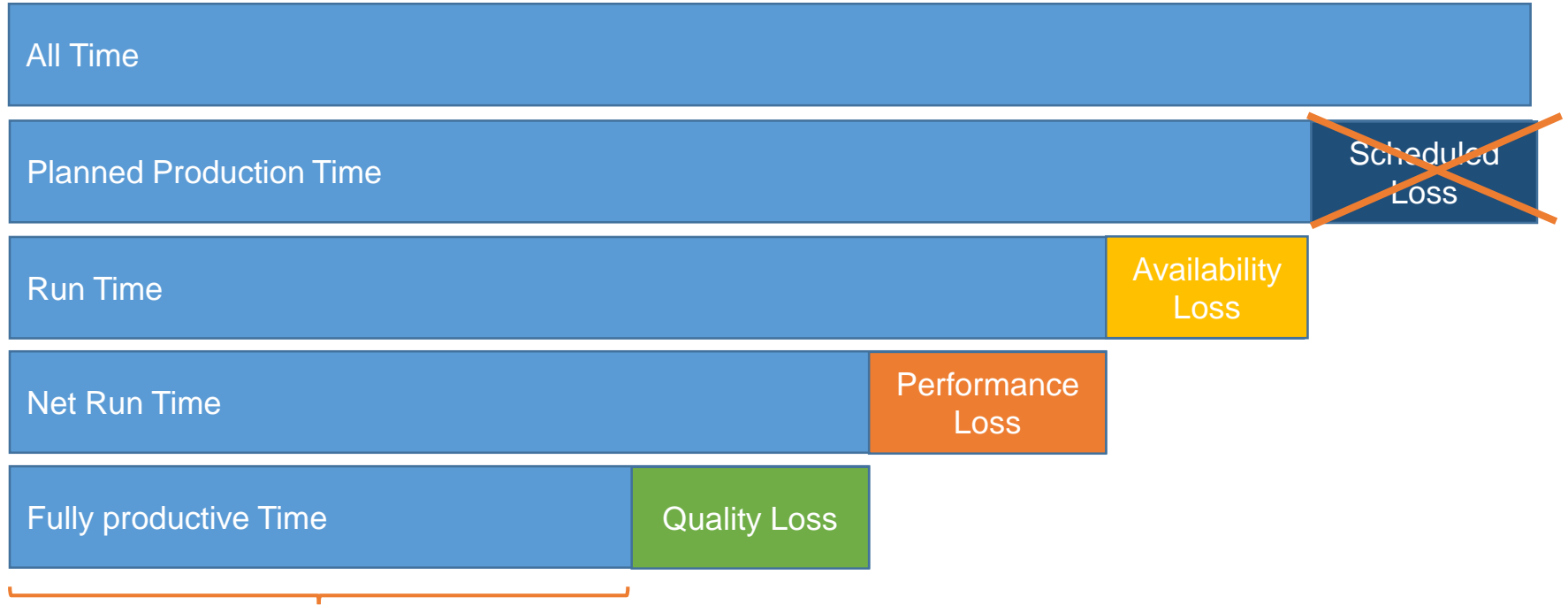
- Small Stops → Idling and Minor Stops
- Slow Cycles → Reduced Speed



Quality

- Production Rejects → Process Defects
- Startup Rejects → Reduced Yield

Time prospective



discrete manufacturing_Home



- HOME
- SHOP FLOOR
- PRODUCTION LINE
- LINE PERFORMANCE
- INLINE QUALITY ANALYTICS
- OEE
- OEE ANALYTICS
- ABOUT

SITES



Detroit, MI
USA



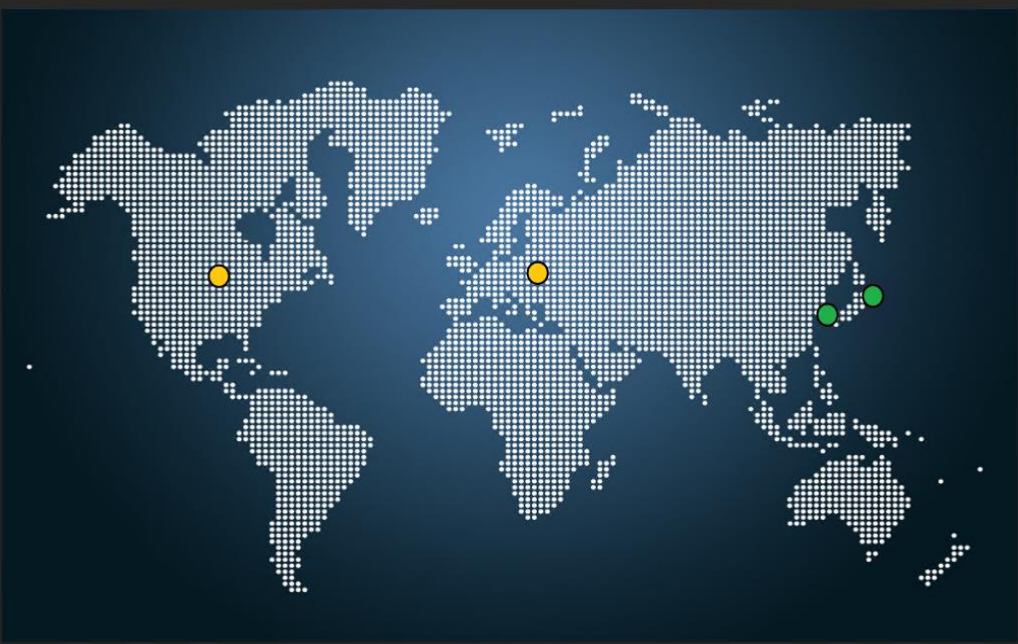
Stuttgart, BW
Germany



Yokohama
Japan



Seoul
Korea



Products

Services

Industries Served

Contact Us

—For Update—

discrete-manufacturing_ProductionLine

Ad Hoc Display



Production Line

HOME

SHOP FLOOR

PRODUCTION LINE

LINE PERFORMANCE

INLINE QUALITY ANALYTICS

OEE

OEE ANALYTICS

ABOUT

Inner Ring

OEE
79.398 %Availability
79.398 %Performance
75.833 %Quality
94.118 %

Outer Ring

OEE
79.861 %Availability
79.861 %Performance
75.833 %Quality
100 %

Rolling Element

OEE
82.986 %Availability
82.986 %Performance
80 %Quality
100 %



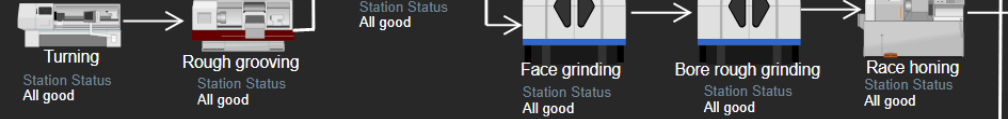
Shop Floor

- HOME
- SHOP FLOOR
- PRODUCTION LINE
- LINE PERFORMANCE
- INLINE QUALITY ANALYTICS
- OEE
- OEE ANALYTICS
- ABOUT

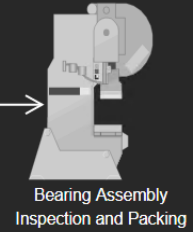
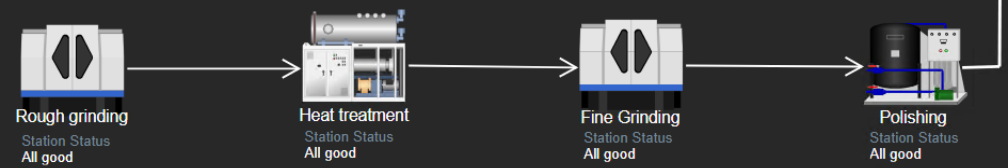
Inner Ring
Materials:
Tubing Bar
AISI 52100



Outer Ring
Materials:
Tubing Bar
AISI 52100



Rolling Element
Materials:
Chromium Alloy Slugs
AISI 52100



discrete manufacturing_OEE_Proces... Asset: CNCLathe004+

Ad Hoc Display



Overall Equipment Effectiveness (OEE)

Process Line Summary and Equipment OEE Details

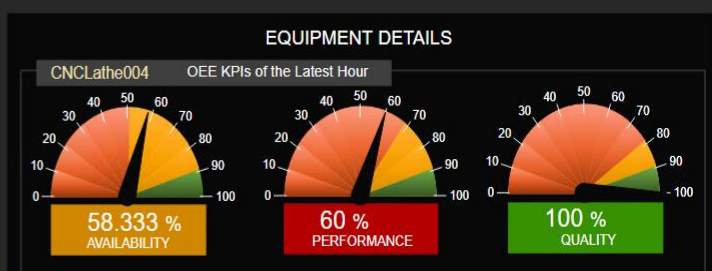
- HOME
- SHOP FLOOR
- PRODUCTION LINE
- LINE PERFORMANCE
- INLINE QUALITY ANALYTICS
- OEE
- OEE ANALYTICS
- ABOUT

- ### BY EQUIPMENT TYPE
- Bore Grinding
 - Chamfer
 - Face Grinding
 - Fine Grinding
 - Heat Treatment
 - Lathe
 - Polishing
 - Ring Polishing
 - Rough Grinding
 - Rough Grooving
- ### BY PROCESS LINE
- Inner Ring
 - Outer Ring
 - Rolling Element
- ### EQUIPMENT ALARM



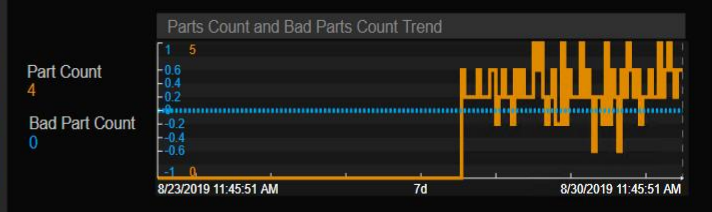
Process Line - Inner Ring Equipment List (Double-click on equipment in list to view more details >>)


Asset	Station	Machine T...	Machine S...	Availability	Performance	Quality	OEE	
BoreGrinder002	Station 5	Bore Grinder	Running	58.333	60	100	35	
CNCLathe004	Station 1	Lathe	Running	58.333	60	100	35	
CNCLathe005	Station 1	Lathe	Running	66.667	60	100	40	
RingPolisher001	Station 6	Ring Polishing	Running	66.667	60	100	40	
RingPolisher002	Station 6	Ring Polishing	Running	66.667	60	100	40	
FaceGrinder002	Station 4	Face Grinding	Running	83.333	75	80	50	
CNCChamfer001	Station 2	Chamfer	Running	75	75	100	56.25	
Furnace002	Station 3	Heat Treatment	Stopped	75	75	100	56.25	
CNCChamfer003	Station 2	Chamfer	Running	83.333	75	100	62.5	
Furnace001	Station 3	Heat Treatment	Running	83.333	75	100	62.5	
RingPolisher003	Station 6	Ring Polishing	Running	83.333	75	100	62.5	
CNCChamfer002	Station 2	Chamfer	Running	91.667	90	83.333	68.75	
FaceGrinder001	Station 4	Face Grinding	Running	83.333	90	100	75	
BoreGrinder001	Station 5	Bore Grinder	Running	91.667	90	100	82.5	
BoreGrinder003	Station 5	Bore Grinder	Running	91.667	90	100	82.5	
CNCLathe006	Station 1	Lathe	Running	91.667	90	100	82.5	
FaceGrinder003	Station 4	Face Grinding	Idle	100	90	100	90	



Equipment Name: CNCLathe004
Equipment No: 004
Manufacturer: TAKISAWA
Model: M18
Installation Date: 5/30/2016 5:00:00 AM
Last Maintenance Date: 7/26/2019 5:00:00 AM

Part Count: 4
Product: 6921
Cycle Time: 540 s
Machine State: **Running**



A photograph of a large industrial manufacturing facility. In the foreground, there's a curved metal track or conveyor system. Behind it, several large, complex machines are visible, some with glass safety enclosures. In the background, multiple assembly lines are visible, with various mechanical components and parts being processed. The overall scene is a busy, well-lit industrial environment.

Recipe to implement OEE

Recipe to implement OEE

Take Action,
Implement Changes,
Continuous
improvement

Connect,
Collect &
Store

Assign
Context

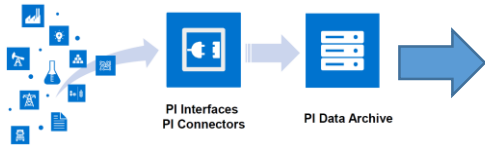
Execute
Condition
Logics

Track Alerts,
Downtime &
Notify

Visualize

**TAKE
ACTION**

1. Connect, Collect&Store



2. Contextualize

- Expression Analysis for line performance calculations and KPI's



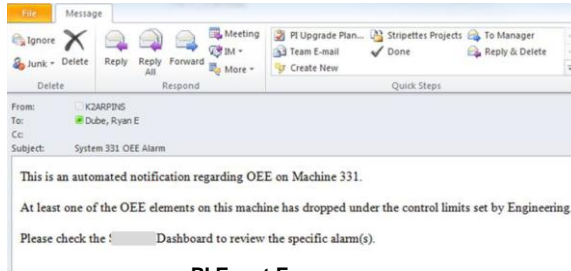
PI AF

3. Execute condition logic

Name	Expression	Value	Output Attribute
GoodPartsPrevious	IF EventCount('Parts_Template/Total Good Parts/Increments',		Parts_Template/Total Good Parts/Increments/GoodParts Previous Week
GoodPartsCurrent	IF EventCount('Parts_Template/Total Good Parts/Increments',		Parts_Template/Total Good Parts/Increments/GoodParts Current Week
GoodPartsFirstHr	IF EventCount('Parts_Template/Total Good Parts/Increments',		Parts_Template/Total Good Parts/Increments/GoodParts First Shift
GoodPartsSecondHr	IF EventCount('Parts_Template/Total Good Parts/Increments',		Parts_Template/Total Good Parts/Increments/GoodParts Second Shift
GoodPartsPreHour	IF EventCount('Parts_Template/Total Good Parts/Increments',		Parts_Template/Total Good Parts/Increments/GoodParts Previous Hour
GoodPartsCurHour	IF EventCount('Parts_Template/Total Good Parts/Increments',		Parts_Template/Total Good Parts/Increments/GoodParts Current Hour

PI Analytics

4. Track Alerts, Downtime & Notify



PI Event Frames

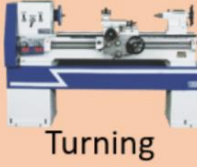
5. Visualize





Flow 01: Inner ring

Materials:
Tubing bar
AISI 52100



Turning



Chamfering



Heat treatment



Face grinding



Bore grinding



Ring Polishing

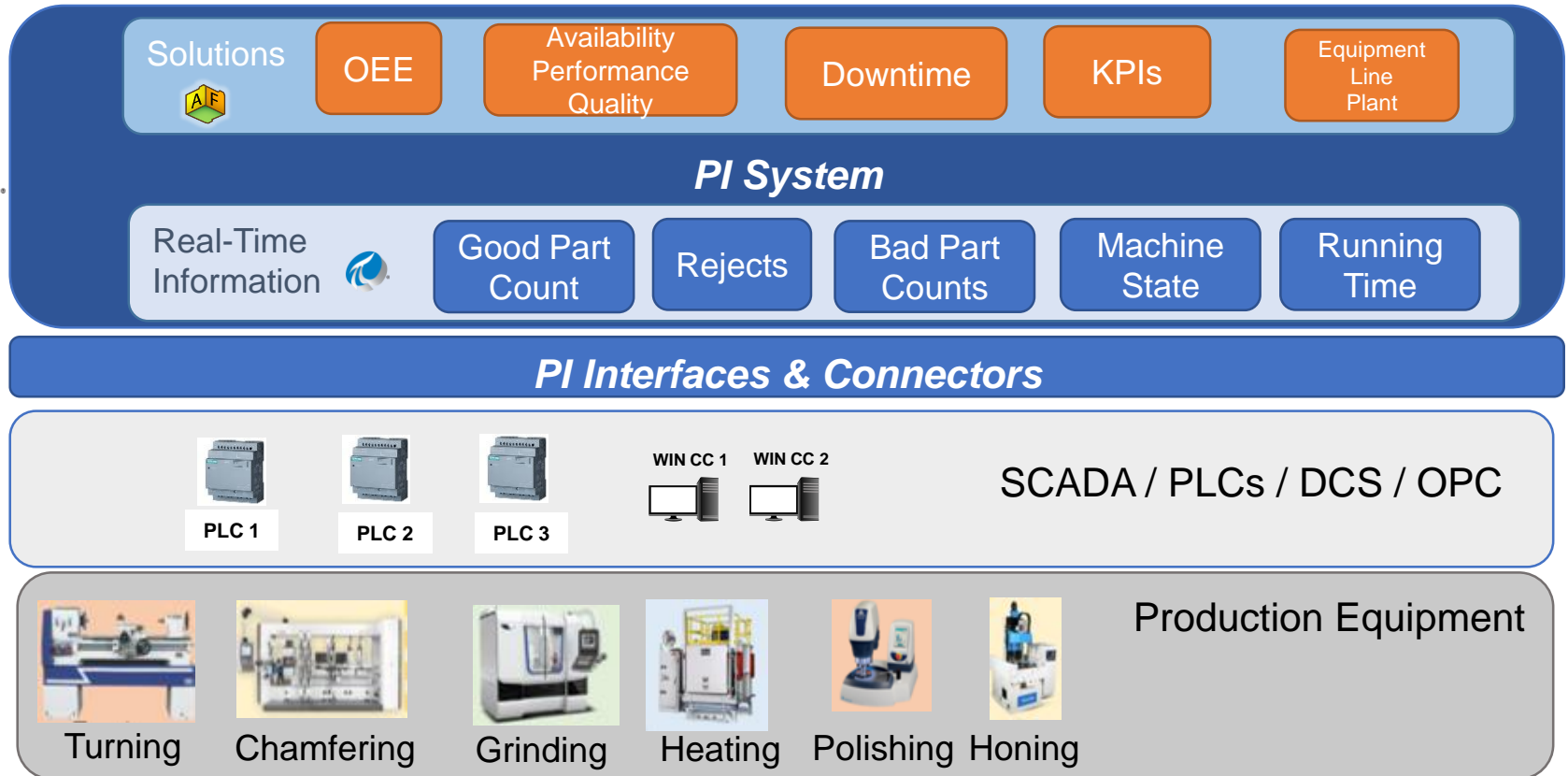
Assembly,
inspection, and
packing station

Warehouse

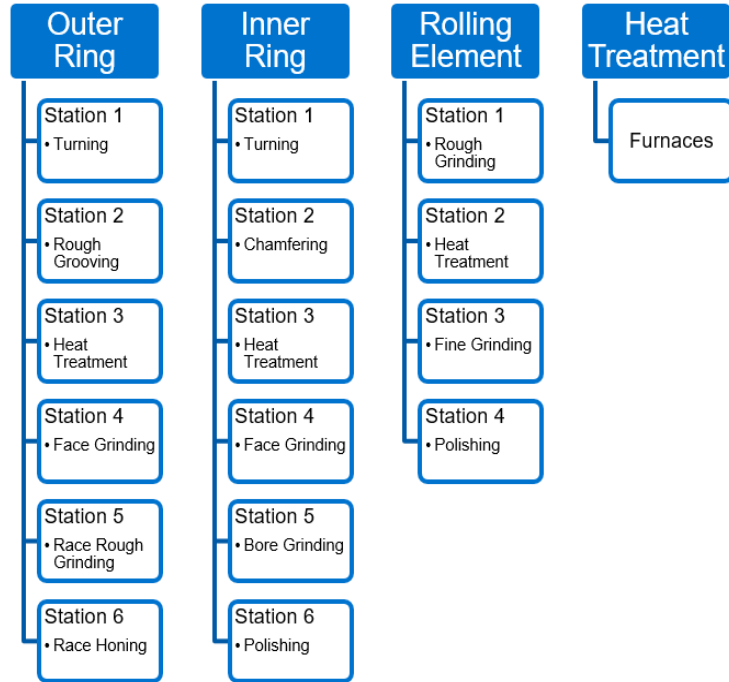


Shop Floor Structure

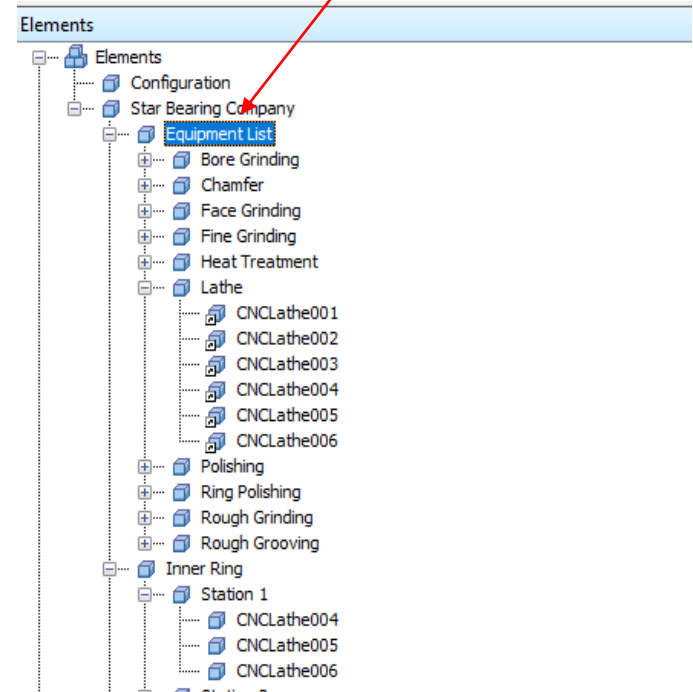
1. Connect your sources



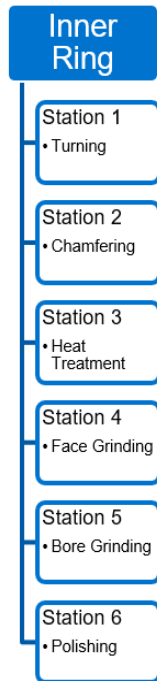
2. Build your context



All Equipment View



Area View



\\PISRV01\Star Bearings empty 1 (Time Context: *) - PI System Explorer (Administrator)

File Search View Go Tools Help

Database Query Date Back Check In Refresh New Element New Attribute

Elements

- Elements
 - Configuration
 - Star Bearing Company
 - Equipment List
 - Inner Ring
 - Station 1
 - CNCLathe004**
 - CNCLathe005
 - CNCLathe006
 - Station 2
 - Station 3
 - Station 4
 - Station 5
 - Station 6
 - Outer Ring
 - Rolling Element
 - Element Searches
 - Element Attribute Search Results 1

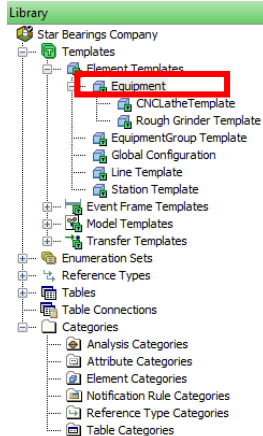
CNCLathe004

General Child Elements Attributes Ports Analyses Notification Rules Version

Filter

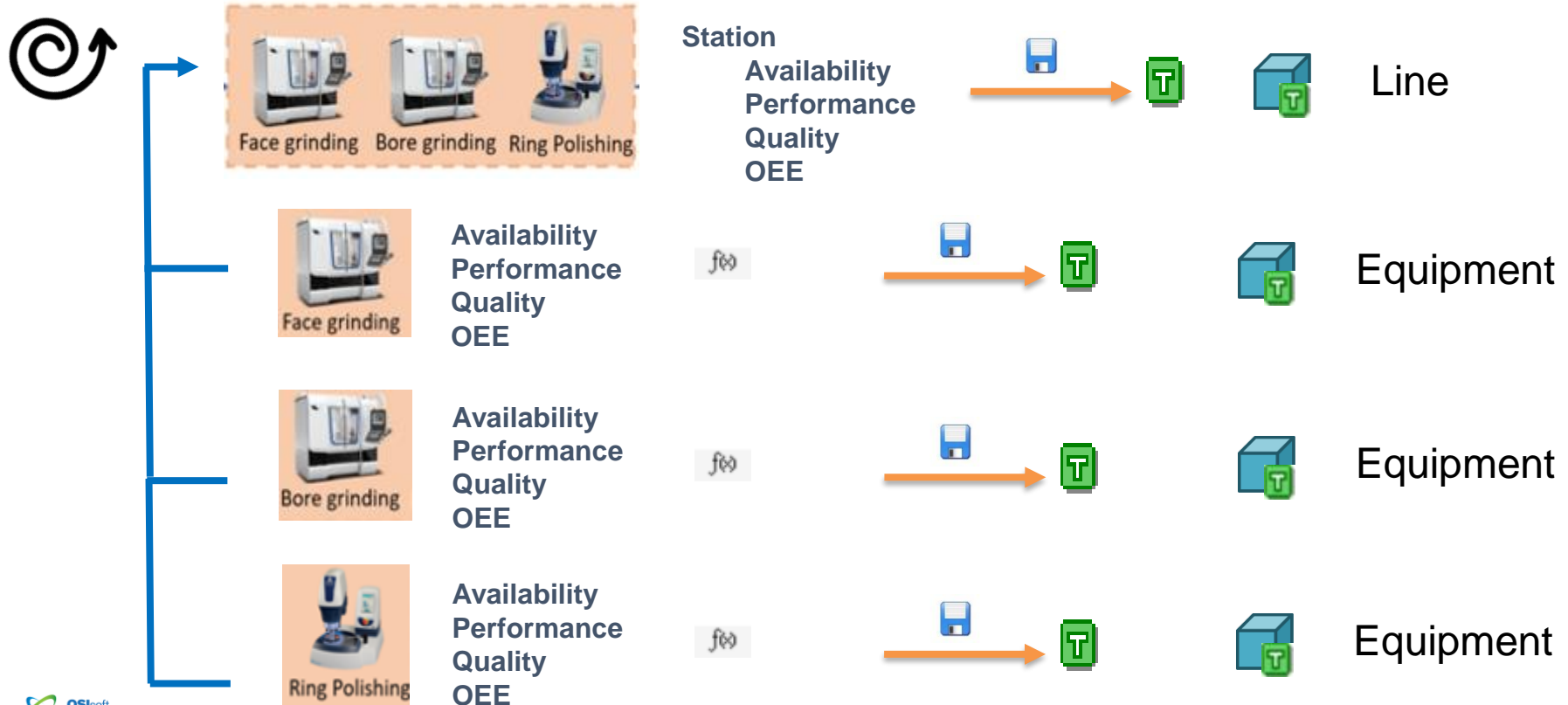
Name	Value
Category: None	
Bad Part Count	2
CycleTime	540 s
Machine State	Running
Part Count	29
Product	6921
RunningTime	3600
Category: Asset Management	
Machine Type	Lathe
MachineName	CNCLathe004
No	004
ProcessLine	Inner Ring
Station	Station 1
Category: Maintenance	
Installation Date	5/30/2016 5:00:00 AM
Last Maintenance Date	12/14/2018 6:00:00 AM
Manufacturer	TAKISAWA
Model	M18

3. Execute Condition Logic @ Template level



Availability	Operating Time / Planned Production Time
Performance	Part Count / (3600/Cycle Time)
Quality	Good Part Count / Part Count
OEE	Availability*Performance*Quality

Roll up calculations to station, lines, groups



File View Go Tools Help
Database Query Date Back Check In Refresh New Template
Search Element Templates

Library

- Star Bearings Company
 - Templates
 - Element Templates
 - Equipment
 - CNCLatheTemplate
 - Rough Grinder Template
 - EquipmentGroup Template
 - Global Configuration
 - Line Template
 - Station Template
 - Event Frame Templates
 - Model Templates
 - Transfer Templates
 - Enumeration Sets
 - Reference Types
 - Tables
 - Table Connections
 - Categories
 - Analysis Categories
 - Attribute Categories
 - Element Categories
 - Notification Rule Categories
 - Reference Type Categories
 - Table Categories

Line Template

General Attribute Templates Ports Analysis Templates Notification Rule Templates

Name

- Line Bad Parts Produced
- Line OEE
- Line OEE Availability**
- Line OEE Performance

Name: Line OEE Availability

Description:

Categories:

Analysis Type: ☐ Expression ☒ Rollup ☐ Event Frame Generation ☐ SQC

☒ Enable analyses when created from template

Example Element: [Star Bearing Company\Rolling Element](#)

Rollup attributes from

☒ Child elements of Rolling Element ☐ This element - Rolling Element

To select attributes set criteria below

Attribute Name: Availability

Attribute Level: Root Level

Attribute Category:

Element Category:

Element Template:

Select the function(s) to write to an attribute Evaluate

Function	Output(s)	Value At Eval	Value At Last
<input type="checkbox"/> Sum			
<input type="checkbox"/> Average			
<input checked="" type="checkbox"/> Minimum	Availability		
<input type="checkbox"/> Maximum			
<input type="checkbox"/> Count			
<input type="checkbox"/> Median			
<input type="checkbox"/> Population standard deviation			
<input type="checkbox"/> Sample standard deviation			

Sample Child Element: Station 1

Group By: None

Name	Parent Element	Categories	UOM
Availability	Station 1	OEE	percent
Bad Part Count	Station 1	Production	
Element Name	Station 1		
OEE	Station 1	OEE	percent
Part Count	Station 1	Production	
Performance	Station 1	OEE	percent
Quality	Station 1	OEE	percent
Station Status	Station 1		

[Show more attributes](#) (Showing 8 of total 8 attributes: 1 items selected)

Elements

Event Frames

Library

Unit of Measure

Contacts

Management

Line Template Modified: 8/27/2019 10:42:09 AM Owner: PISCHOO1\student01

Backfill the results to get data from the past!

\\PISRV01\Star Bearings Company - PI System Explorer (Administrator)

File View Go Tools Help

Database Query Date Back Check In Refresh

Management

Choose a type

☒ Analyses

☐ Notification Rules

Analysis Searches

+ X

All

Enabled

Disabled

OEE Metrics

EquipmentGroup OEE

Station OEE

Line OEE

Analyses

12 total analyses selected (12 on this page) 1 - 12 of 12

✓	Status	Element	Name	Template
✓	✓	Star Bearing Company\Rolling Element	Line Bad Parts Produced	Line Bad Parts Produced
✓	✓	Star Bearing Company\Outer Ring	Line Bad Parts Produced	Line Bad Parts Produced
✓	✓	Star Bearing Company\Inner Ring	Line Bad Parts Produced	Line Bad Parts Produced
✓	✓	Star Bearing Company\Rolling Element	Line OEE	Line OEE
✓	✓	Star Bearing Company\Inner Ring	Line OEE	Line OEE
✓	✓	Star Bearing Company\Rolling Element	Line OEE Availability	Line OEE Availability
✓	✓	Star Bearing Company\Inner Ring	Line OEE Availability	Line OEE Availability
✓	✓	Star Bearing Company\Rolling Element	Line OEE Performance	Line OEE Performance
✓	✓	Star Bearing Company\Inner Ring	Line OEE Performance	Line OEE Performance
✓	✓	Star Bearing Company\Rolling Element	Line Parts Produced	Line Parts Produced
✓	✓	Star Bearing Company\Outer Ring	Line Parts Produced	Line Parts Produced
✓	✓	Star Bearing Company\Inner Ring	Line Parts Produced	Line Parts Produced

Operations

[Enable](#) | [Disable](#) selected analyses

[Enable](#) | [Disable](#) automatic recalculation for selected analyses

[Backfill/Recalculate](#) selected analyses

Start: *-30d

End: *

What should we do with existing data?

☐ Leave existing data and fill in gaps

☒ Permanently delete existing data and recalculate

☐ Recalculate dependent analyses

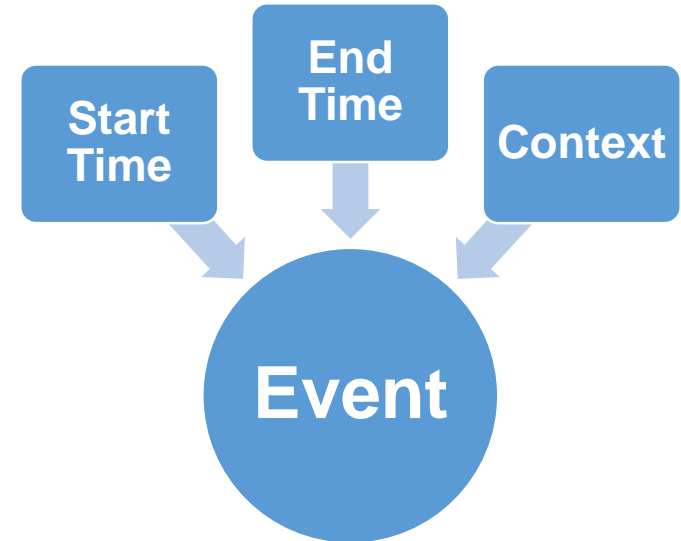
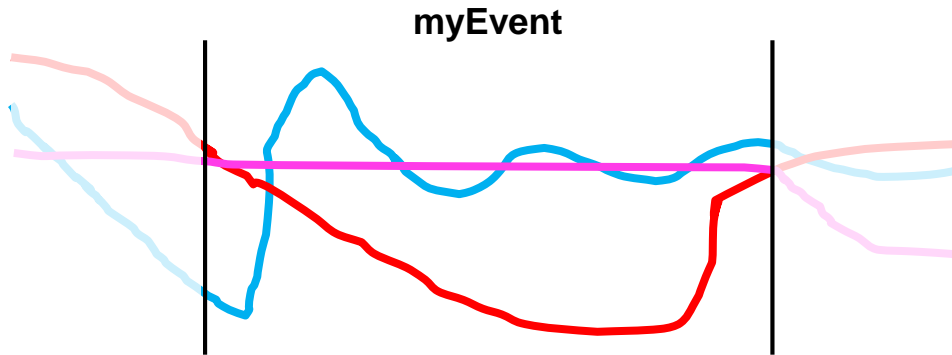
Queue

Recalculation will permanently delete all the data within the time range. For event frames this will result in loss of annotations and calculated elements.

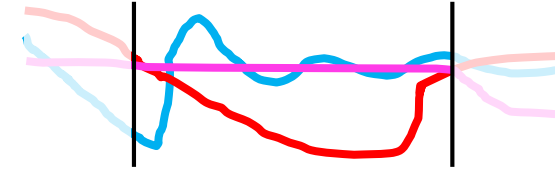
4. Track, Alert & Notify



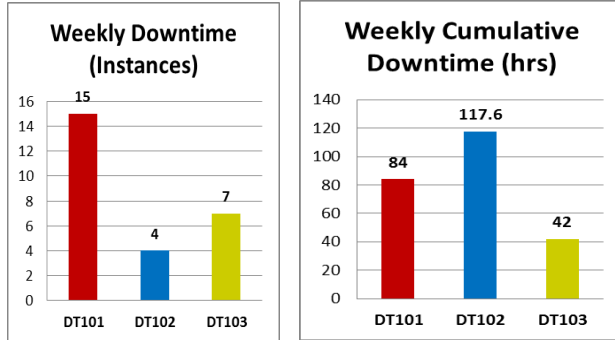
- Use Event Frames to track downtime and establish reason codes.



Events will help you to...



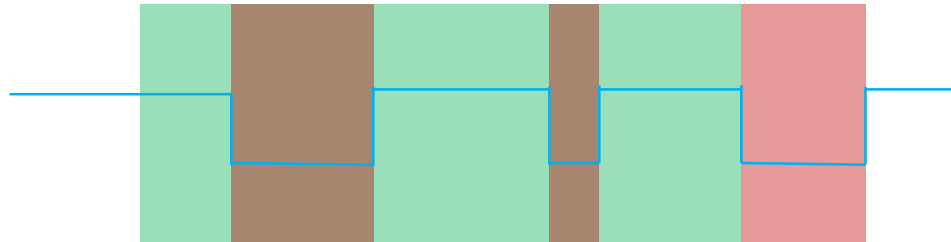
1) Perform Asset Comparisons



2) Compare similar behaviours



3) Track downtimes



Use Enumeration Sets as reason codes

- Enumeration Sets
 - Bad Part Reason
 - Machine Status
 - Machine Unplanned Downtime Reason Code
 - OEE Metrics
 - Operators
 - Part Creation Flag
 - Part Quality
 - Products
 - Shift Information
 - Station status

Name: Machine Status

Description:

☐ Hexadecimal [Security](#)

Value	Name
0	Running
1	Idle
2	Stopped
3	Unplanned Stopped

Name: Machine Unplanned Downtime Reason Code

Description:

☐ Hexadecimal [Security](#)

Value	Name
0	Electrical failure
1	Mechanical failure
2	Cuts not within tolerance

Name: OEE Metrics

Description:

☐ Hexadecimal [Security](#)

Value	Name	Description
0	Productive Time	Valuable Operating Time
1	Unplanned Stops	Equipment Failure
2	Planned Stops	Setup and Adjustments
3	Small Stops	Idling and Minor Stops
4	Slow Cycles	Reduced Speed
5	Production Rejects	Process Defects
6	Startup Rejects	Reduced Yield

Availability Loss	Unplanned Stops	Equipment Failure
	Planned Stops	Setup and Adjustments
Performance Loss	Small Stops	Idling and Minor Stops
	Slow Cycles	Reduced Speed
Quality Loss	Production Rejects	Process Defects
	Startup Rejects	Reduced Yield
OEE	Fully Productive Time	Valuable Operating Time

5. Visualise

Multi-state symbols

discrete manufacturing_OEE_Equip_...

Asset: BoreGrinder002+ ▼

Ad Hoc Display



Overall Equipment Effectiveness (OEE)
Equipment Type Summary and Equipment OEE Details

HOME

SHOP FLOOR

PRODUCTION LINE

LINE PERFORMANCE

INLINE QUALITY ANALYTICS

OEE

OEE ANALYTICS

ABOUT

BY EQUIPMENT TYPE

Bore Grinding

Chamfer

Face Grinding

Fine Grinding

Heat Treatment

Lathe

Polishing

Ring Polishing

Rough Grinding

Rough Grooving

BY PROCESS LINE

Inner Ring

Outer Ring

Rolling Element

EQUIPMENT ALARM

BORE GRINDING EQUIPMENT SUMMARY

Bore Grinding Equipment OEE KPIs of the Latest Hour



Bore Grinding Equipment List

(Double-click on equipment in list to view more details >>)

Asset	Station	ProcessLine	Machine T...	Machine S...	Availability	Performance	Quality
BoreGrinder001	Station 5	Inner Ring	Bore Grinder	Running	83.333	75	100
BoreGrinder002	Station 5	Inner Ring	Bore Grinder	Running	75	75	100
BoreGrinder003	Station 5	Inner Ring	Bore Grinder	Unplanned Stopper	75	75	100
BoreGrinder004	Station 5	Outer Ring	Bore Grinder	Running	86.867	60	100
BoreGrinder005	Station 5	Outer Ring	Bore Grinder	Running	75	75	100
BoreGrinder006	Station 5	Outer Ring	Bore Grinder	Running	83.333	75	100

EQUIPMENT DETAILS

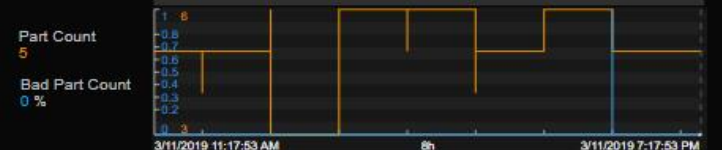
BoreGrinder002 OEE KPIs of the Latest Hour



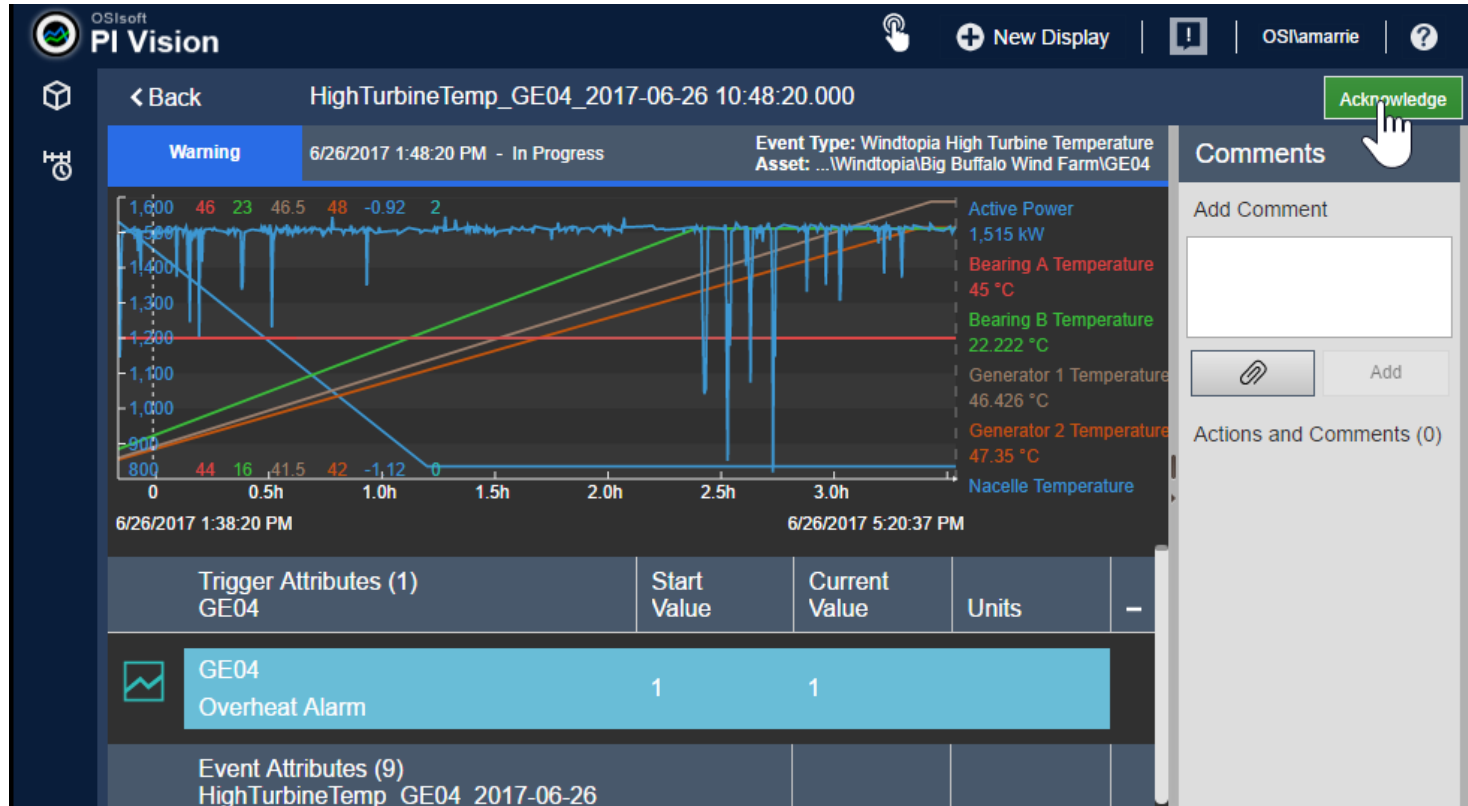
Equipment Name: BoreGrinder002
Equipment No: 002
Manufacturer: OKUMA
Model: M15
Installation Date: 5/8/2016 5:00:00 AM
Last Maintenance Date: 2/2/2019 6:00:00 AM

Part Count: 5
Product: 6921
Cycle Time: 540 s
Machine State: Running

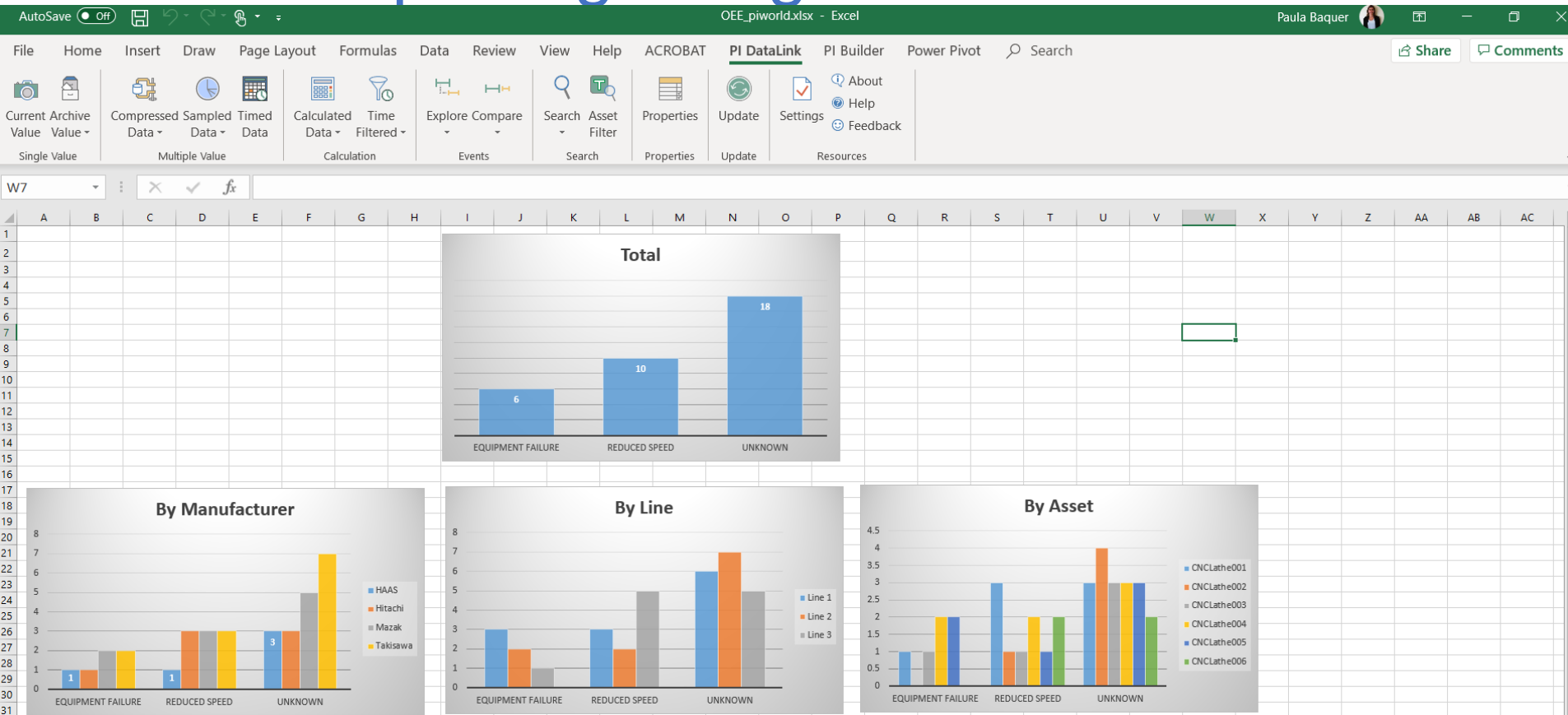
Parts Count and Bad Parts Count Trend



View and respond to events



Excel Reporting using PI DataLink



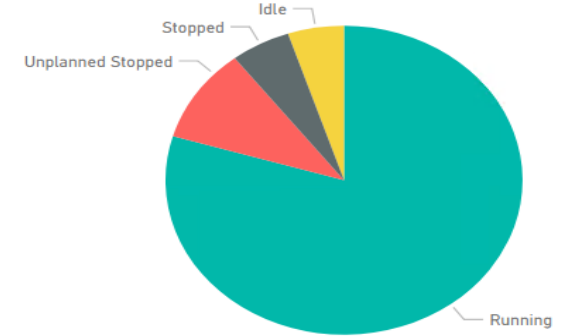
Build dashboards with drill-down capabilities

Star Bearing Company - OEE Analysis

- Line Template
- Inner Ring
 - Station 1
 - CNCLathe004
 - CNCLathe005
 - CNCLathe006
 - Station 2
 - Station 3
 - Station 4
 - Station 5
 - Station 6
 - Outer Ring
 - Rolling Element

Line Template	Average of Performance	Average of Availability	Average of Quality
Inner Ring	75.13	78.53	99.19
Outer Ring	76.77	80.33	99.03
Rolling Element	76.56	80.24	98.85
Total	76.07	79.58	99.06

Machine States proportion



Average of Performance, Average of Availability and Average of Quality by D...



TimeStamp

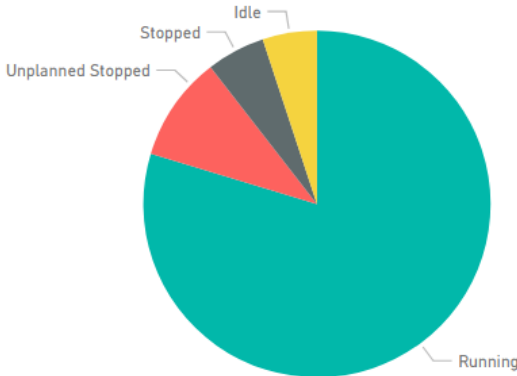
3/1/2019 3/7/2019

Star Bearing Company - OEE Analysis

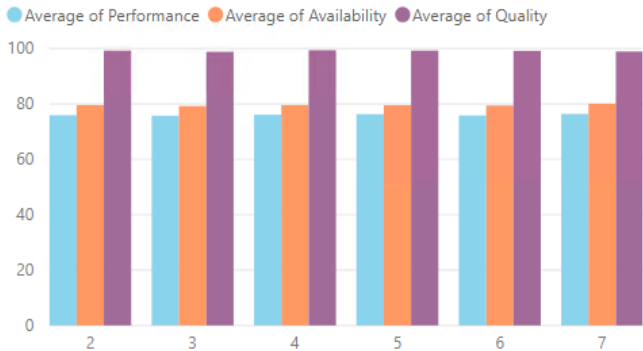
- Line Template
- Inner Ring
 - Station 1
 - CNCLathe004
 - CNCLathe005
 - CNCLathe006
 - Station 2
 - Station 3
 - Station 4
 - Station 5
 - Station 6
 - Outer Ring
 - Rolling Element

Station	Average of Performance	Average of Availability	Average of Quality
Station 1	72.18	75.23	99.19
Station 6	76.29	79.76	99.52
Station 5	76.31	79.92	99.02
Station 4	76.60	80.21	98.83
Station 2	76.98	80.64	99.20
Station 3	77.03	80.65	99.11
Total	76.03	79.55	99.12

Machine States proportion



Average of Performance, Average of Availability and Average of Quality by D...



TimeStamp

3/2/2019

3/7/2019



Star Bearing Company - OEE Analysis

Line Template

☐ Inner Ring

☒ Station 1

☐ CNCLathe004

☐ CNCLathe005

☐ CNCLathe006

☒ Station 2

☐ CNCChamfer001

☐ CNCChamfer002

☐ CNCChamfer003

☐ Station 3

☒ Station 4

☐ FaceGrinder001

☐ FaceGrinder002

☐ FaceGrinder003

☒ Station 5

☐ BoreGrinder001

☐ BoreGrinder002

☐ BoreGrinder003

☒ Station 6

☐ RingPolisher001

☐ RingPolisher002

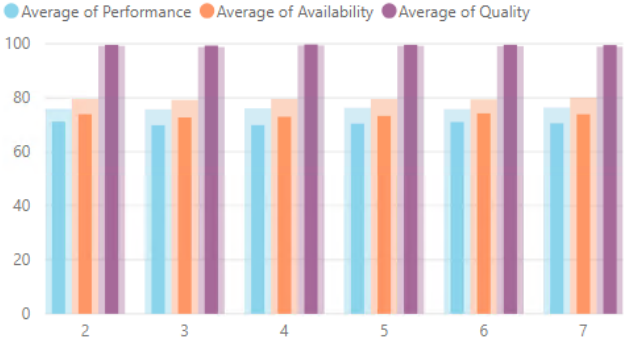
☐ RingPolisher003

☐ Outer Ring

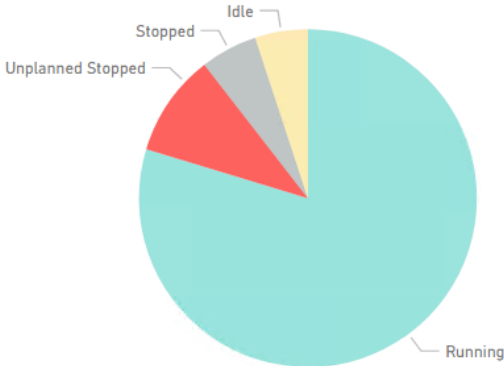
☐ Rolling Element

Equipment	Average of Performance	Average of Availability	Average of Quality
CNCLathe004	44.28	43.78	100.00
CNCLathe001	69.00	71.88	99.79
Polisher003	69.04	71.89	99.16
BoreGrinder004	69.95	72.28	99.83
BoreGrinder005	69.19	72.29	99.25
CNCLathe002	70.63	72.92	99.77
FaceGrinder003	71.11	73.15	100.00
FaceGrinder005	69.94	73.16	99.53
FaceGrinder004	69.04	73.19	99.80
Furnace002	70.12	73.39	100.00
FaceGrinder001	70.78	73.44	99.06
RingPolisher001	69.85	73.45	99.80
CNCLathe003	69.53	73.53	98.90
Total	70.47	73.49	99.58

Average of Performance, Average of Availability and Average of Quality by D...



Machine States proportion



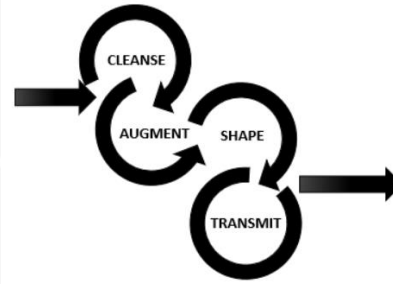
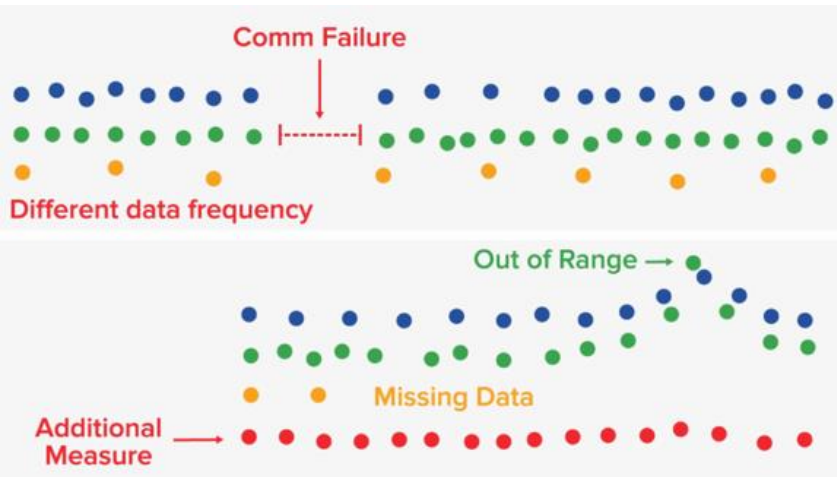
TimeStamp

3/2/2019

3/7/2019



PI Integrators enable Advanced Analytics



The screenshot shows a data table with columns: Timestamp, Month, Day of the Week, Floor, WVCO, Cooling SP Offset, Occupied Setpoint, and Space Hum. The table contains data for various floors and times.

Timestamp	Month	Day of the Week	Floor	WVCO	Cooling SP Offset	Occupied Setpoint	Space Hum
4/20/2018 8:30:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 8:44:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 8:58:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 9:12:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 9:26:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 9:40:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 9:54:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 10:08:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 10:22:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 10:36:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 10:50:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 11:04:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 11:18:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 11:32:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 11:46:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 12:00:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 12:14:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 12:28:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 12:42:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 12:56:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 1:10:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 1:24:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 1:38:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 1:52:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 2:06:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 2:20:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 2:34:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 2:48:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 3:02:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 3:16:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 3:30:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 3:44:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 3:58:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 4:12:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 4:26:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 4:40:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 4:54:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 5:08:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 5:22:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 5:36:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 5:50:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 6:04:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 6:18:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 6:32:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 6:46:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 7:00:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 7:14:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 7:28:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 7:42:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 7:56:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 8:10:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 8:24:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 8:38:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 8:52:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 9:06:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 9:20:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 9:34:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 9:48:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 10:02:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 10:16:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 10:30:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 10:44:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 10:58:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 11:12:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 11:26:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 11:40:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 11:54:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 12:08:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 12:22:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 12:36:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 12:50:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34
4/20/2018 1:04:42:375 AM	4	Friday	Floor_5	WVCO 6-01	1	73	34

Why it matters?

Time-series data is not naturally aligned

Same type of equipment will have different measurements

Required for feature selection

Data has connection to the physical world

Correlate

Identify patterns visually

Apply Algorithms

Predict with known levels of accuracy



A success in just 3 months!

- Pilot site Performance improvement of 40%
- Pilot site Availability improvement of 21%
- Pilot site OEE improvement of 30%

Summary

CHALLENGES

- Unable to reach the production target.
- Unable to explain reasons on bad pieces produced.
- Unable identify downtime reasons
- Lack of reporting and analytics capabilities

SOLUTION

- **5 step Recipe to success**
- capture information across the whole site.
- Standards to compare effectively equipment across sites.
- Track downtime events and associate reason codes.
- Visibility across production line in real-time.
- Platform for global data management, reporting and fast access for continuous process improvement.


BENEFITS



- Capacity
- Production
- Equipment efficiency
- Quality



- Downtime
- Start-up Time
- Product Rejects
- Maintenance Costs



And you? Are you ready to
transform your world?

Resources to Help you Succeed



Where to start?



PI Square

The OSIsoft Community



Asset Based PI Example Kits

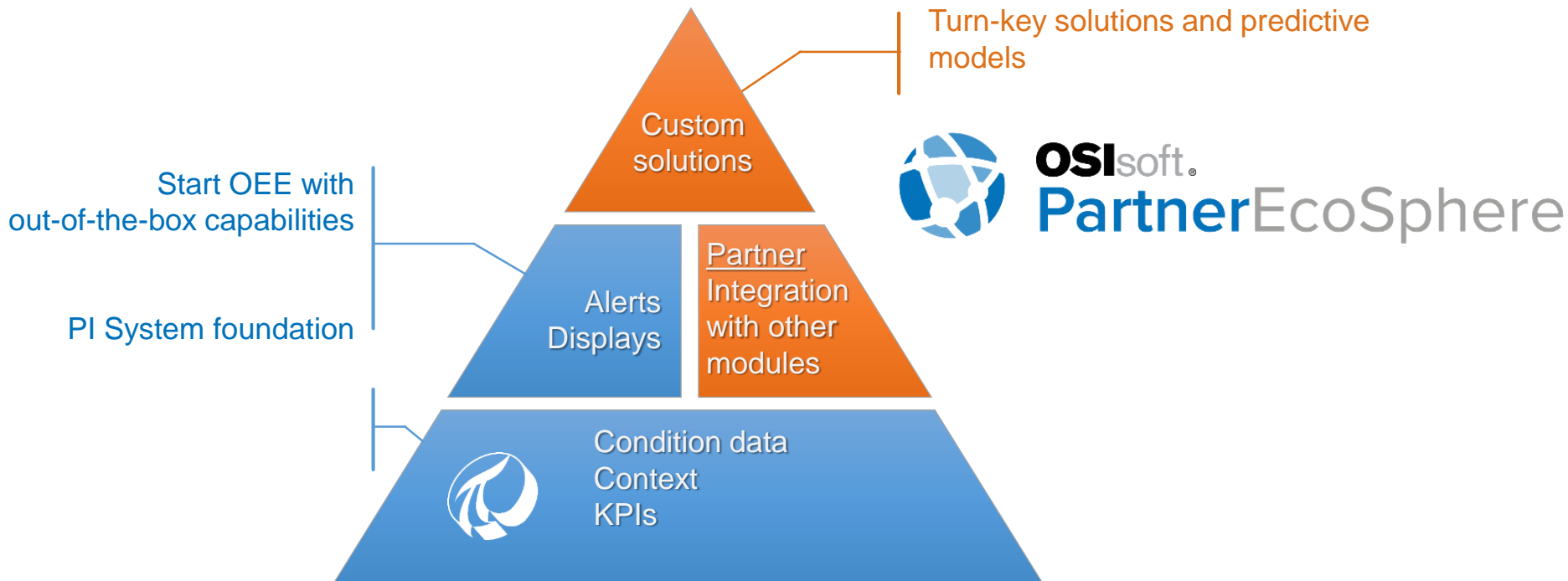
PUBLISHED EXAMPLE KITS

Items tagged with asset based pi example kit, asset based pi example kits

- Asset Based Example Kit for Pump Operation Monitoring and Efficiency Analysis
- Asset Based PI Example Kit for Pump Condition Based Maintenance
- Asset Based PI Example Kit – Integrated Mill
- Asset Based PI Example Kit for Solar Plant Monitoring
- Asset Based PI Example Kit – Fleet Maintenance and Production
- Asset Based PI Example Kit for Reactor OEE
- Asset Based PI Example Kit for CBM for Small Hydropower Plants
- Asset Based PI Example Kit for Mineral Processing
- Asset Based PI Example Kit for Ենթամթերքի մոնիթինգ
- Asset Based PI Example Kit for Mill Specific Power Consumption
- Asset Based PI Example Kit for Oil & Gas Well Downtime Tracking
- Asset Based PI Example Kit for Mobile Asset Performance Monitoring

<https://pisquare.osisoft.com/community/all-things-pi/af-library/asset-based-pi-example-kits>

Don't forget that partners are also here to help!



... and during PIWorld? Tech-Lab!

Using AF to Analyse Asset Performance

- **When:** Thursday 19th September 9AM-12.15 PM
- **Where:** *Lab 3, GT: J2, 2nd floor*

Let's stay connected!



Paula Baquer

pbaquer@osisoft.com

Customer Success Manager
OSIssoft



Questions?

Please wait for
the **microphone**

State your
name & company



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mobile agenda for survey

