Asset Utilization Metrics Through Continuous Contextualization of Process Data

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OSIsoft.
PI World SAN FRANCISCO 2018

Conference Theme & Keywords

Asset Utilization Metrics

Leverage existing manufacturing asset thru continuous data.

CHALLENGE

Quantify how much time each asset is spending in various process state to identify optimization opportunities

- Focus on the line bottlenecks (dryers, fillers, etc)
- Find the correlation with OEE

SOLUTION

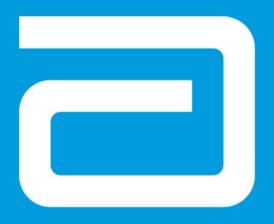Continuous data in PI is useful but need engineer to contextualize into transform into actionable information

- Data is collected continuously in OSI PI across the network
- Excel spreadsheet was developed independently to provide snap shot reports
- Define key tags to tell the asset utilization story

RESULTS

Leverage PI data and SEEQ capsules to quickly quantify modes of operation deliver information to various audiences

- SEEQ organizer score card display to display key asset utilization.
- Score card display to trigger RCA

life. to the fullest.

IMPROVING LIVES FOR 125+ YEARS

1880s
Dr. Wallace Abbott advances the science of medications to improve accuracy and effectiveness.

1930s—1960s
Expands into vitamins and, later, infant formula, marking decades of growth in nutrition.

1970s—1980s
Creates the modern diagnostics industry with ground-breaking products.

1990s—2000s
Sharpens its focus on medical devices, to deliver unprecedented innovation.

TODAY
Abbott continues to shape new ways to bring better health to people all over the world, through diverse products and technologies.

GETTING PEOPLE
BACK TO DOING
THE THINGS THEY LOVE

Nutrition

Diagnostics

Medical devices

Branded generic
pharmaceuticals

Proprietary and confidential — do not distribute

Living Your Best Life Through the Power of Health | 4/25/2018

Nutrition

SCIENCE-BASED NUTRITION AT EVERY STAGE OF LIFE

Pediatric nutrition

Adult nutrition

Performance nutrition

Nutrition

AMONG THE MOST TRUSTED NAMES IN NUTRITION WORLDWIDE

PEDIATRIC
Infant Formula
Growing Up Milk/Toddler
Supplemental Nutrition

ADULT
Supplemental Nutrition &
Healthy Snacks
Disease-specific (Diabetes,
Cancer, Kidney)
Medical Foods

PERFORMANCE
Sports and Fitness Enthusiast

MAKING A NOTABLE DIFFERENCE

100 top Global Innovators,
Clarivate Analytics 2013 - 2016

Fortune's Most Admired Companies since 1984; #1 in
Medical Products from 2014 - 2016

Top 20 Employer,
Science, for twelve years

Top 50 Companies for Diversity,
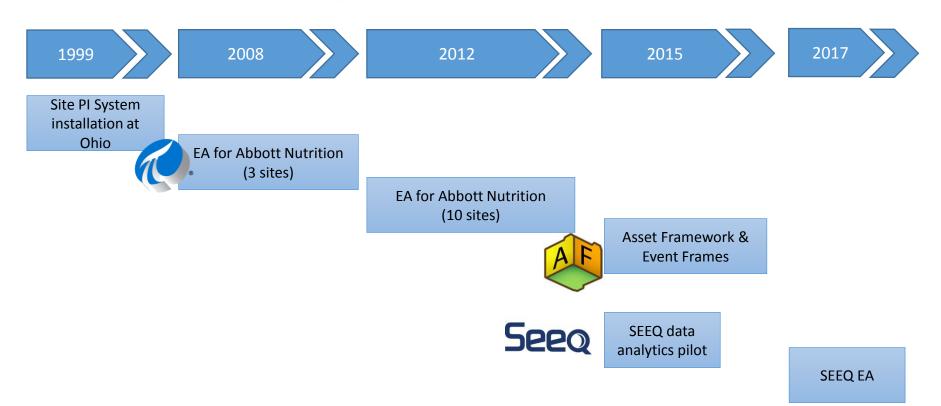*DiversityInc.,* for 12 consecutive years

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100 Best Companies,
Working Mother, for 15 years in a row

Industry Group Leader,
Dow Jones Sustainability Index,
2013 - 2016; 12th year on the Index

Workplace leadership
In more than 25 countries

     Living Your Best Life Through the Power of Health | 4/25/2018

Timeline for OSIsoft PI System at Abbott Nutrition

| 1999 | 2008 | 2012 | 2015 | 2017 |

1999 — Site PI System installation at Ohio

2008 — EA for Abbott Nutrition (3 sites)

2012 — EA for Abbott Nutrition (10 sites)

2015 — Asset Framework & Event Frames
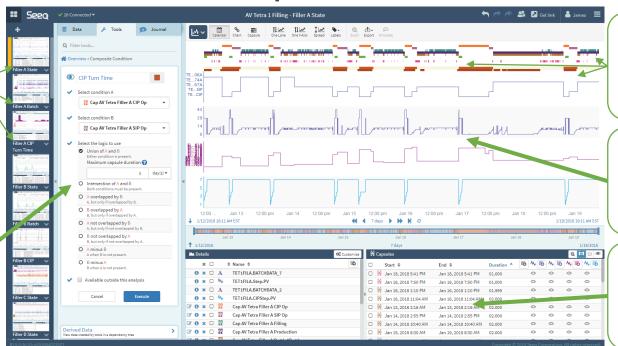
SEEQ data analytics pilot

2017 — SEEQ EA

Using Capsules/Conditions to Define Important Modes of Operation

Worksheets – Organizing different steps in the analysis

Tool Panel – Analytical tools to help define and combine capsules

Capsules - Visually marking each time period of interest

Process Signals – High fidelity process signals from OSIsoft Pi

Capsule Table – Properties and statistics of each individual capsule

SAN FRANCISCO 2018

Analysis with "Capsules" and "Conditions"

Create New Conditions

Shifts

CIP Flow Limits

Batch IDs & Step Numbers

Capsule for detailed mode or sub-mode of operation
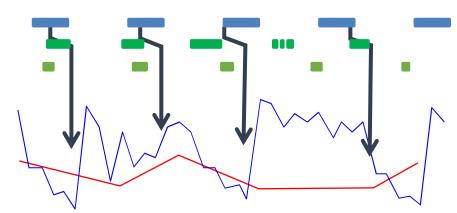
New capsules defined by intersection, or other operators

Create New Signals
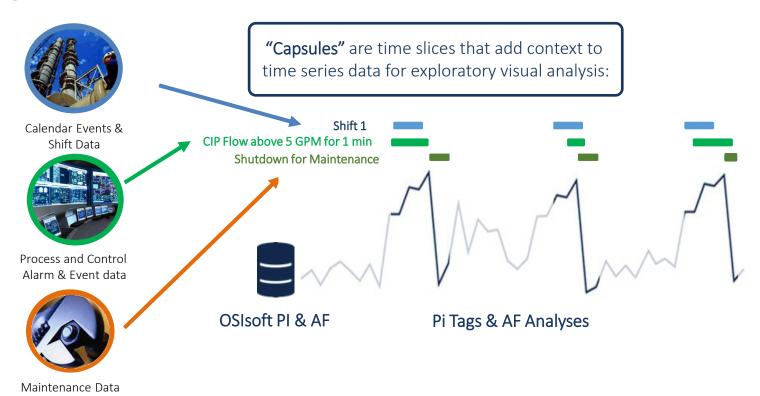
Shifts

CIP Flow Limits

Batch IDs & Step Numbers

- **Total duration of condition per week**
  - **Totalized CIP flow rate**
- **Max conductivity reached**

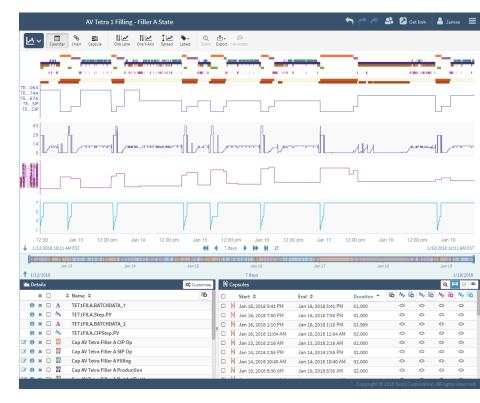**New signal define by an engineering calculation across conditions**

Capsules – Ad-Hoc Data Contextualization

Calendar Events & Shift Data

Process and Control Alarm & Event data

Maintenance Data

"Capsules" are time slices that add context to time series data for exploratory visual analysis:

Shift 1

CIP Flow above 5 GPM for 1 min

Shutdown for Maintenance

OSIsoft PI & AF

Pi Tags & AF Analyses

Create Modes and Metrics

- Conditions created for all major modes & sub-modes of operation
  - Production
    - Running
    - Waiting for product
  - CIP
    - Running
    - On-Hold
  - ....
- Key metrics developed for each mode
  - Total and % Time per mode
  - Total water usage per CIP cycle
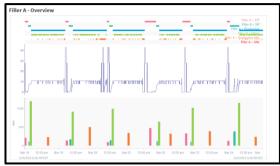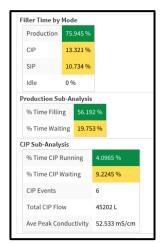 - Peak conductivity per CIP cycle

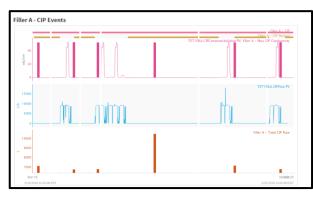# Summarizing Analytics into Relevant Visuals & Metrics

- Total Weekly Overviews

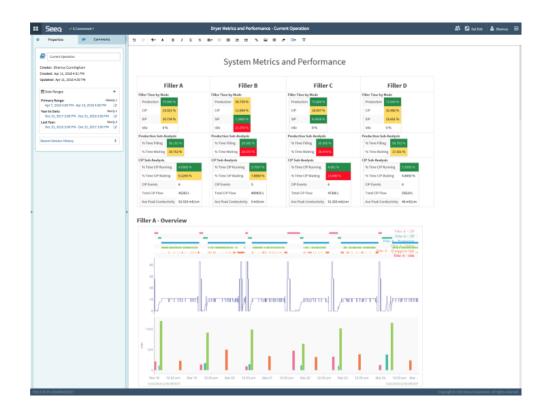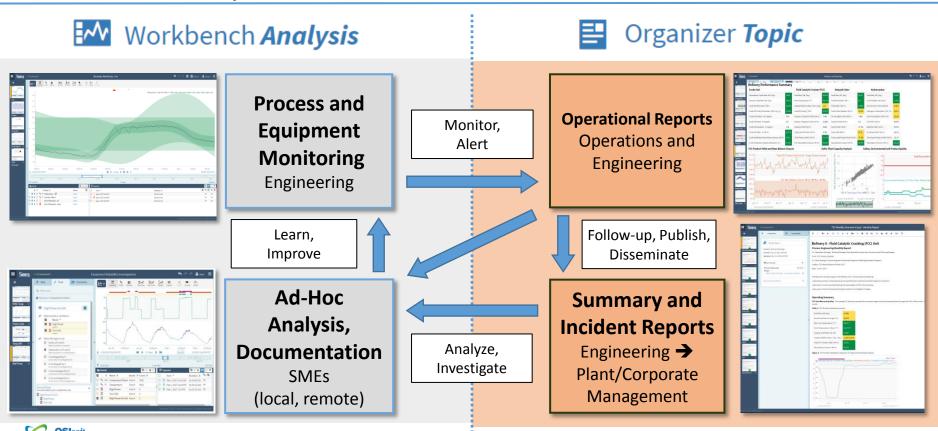- Filtered Charts for Modes of Operation

- Metric Scorecards

Combining Multiple Analyses into a Single Dashboard/Document

- Scorecards & Charts are attached to multiple relevant timeframes
  - Last Hour, Last Week, Last Quarter

- Topic updates with the latest Pi Data every 5 minutes

- Users can comment on the daily performance, any anomalies and all changes to the document are automatically recorded and tracked

Continuous Improvement Workflow

Workbench Analysis

Organizer Topic

Process and Equipment Monitoring
Engineering

Monitor, Alert

Operational Reports
Operations and Engineering

Learn, Improve

Follow-up, Publish, Disseminate

Ad-Hoc Analysis, Documentation
SMEs (local, remote)

Analyze, Investigate

Summary and Incident Reports
Engineering ➔ Plant/Corporate Management

Batch Tracking and Asset Utilization Metrics Through Continuous Contextualization of Process Data

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Seeq

Merci

谢谢

Спасибо

Danke

Gracias

Thank You

감사합니다

ありがとう

Grazie

Obrigado

Optional: Click to add a takeaway you
wish the audience to leave with.