

Lonza's Journey Deploying Data Analytics for Manufacturing Insights

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Lonza

Agenda



Who is Lonza Specialty Ingredients?



Challenges in Operation



The Pain Point: End-of Life Visualizations



Implementation of Seeq[®]



Data Infrastructure



Productivity Improvements via Operational Technology

Lonza at a Glance



Lonza - The Structure



Lonza Pharma Biotech & Nutrition (LPBN)

- **Drug substance and drug product development and manufacturing for**
 - Chemicals – small molecules
 - Biologics – large molecules
 - Biologics – cell and gene technologies
- **Consumables and research tools**
- **Consumer health and nutritional ingredients and delivery systems**

Lonza Specialty Ingredients (LSI)

- **Microbial Control Solutions for**
 - Consumer home & personal care
 - Professional hygiene
 - Paints, coatings, wood and industrial material protection
 - Crop protection
- **Enabling Technologies**
 - Fine Chemistry
 - White Biotechnology

Since 1 March 2019, the scope of segments has been aligned. The former Pharma & Biotech segment and the former Consumer Health & Nutrition business unit within the Consumer Health division (formerly part of Lonza Specialty Ingredients) are now combined in the Lonza Pharma Biotech & Nutrition (LPBN) segment. The former Consumer Product Ingredients business unit (formerly part of the Consumer Health division within Lonza Specialty Ingredients) remained part of the Specialty Ingredients segment.

Delivering Innovation in Microbial-Control Applications



Some recent examples

Next Generation Antidandruff Active

Strengthening position as world's leading antidandruff active supplier

Commenced manufacturing of Piroctone Olamine (PO) to broaden portfolio



Keeping our World Healthy®

New additions to regulated Professional Hygiene offerings

Introduction of hydrogen peroxide-based hard surface disinfectants and FDA-approved non-alcohol hand sanitizers



Regulatory Support

Introduction of microbial-control alternatives, e.g. Triclosan-free antibacterial personal care, Creosote-free protection for timber, regulatory approved fungicides for open system metalworking fluids



Bioactives

Product launches for personal care “aspirational” consumers

Introduction of naturally derived polyglycerol esters for non-ionic emulsifiers and surfactants, and bioactives for scalp and skin



Lonza at a Glance



Capitalizing on our global footprint (overview of our manufacturing and R&D sites and our sales offices)

Global Footprint



*Octane Biotech – a Lonza Subsidiary

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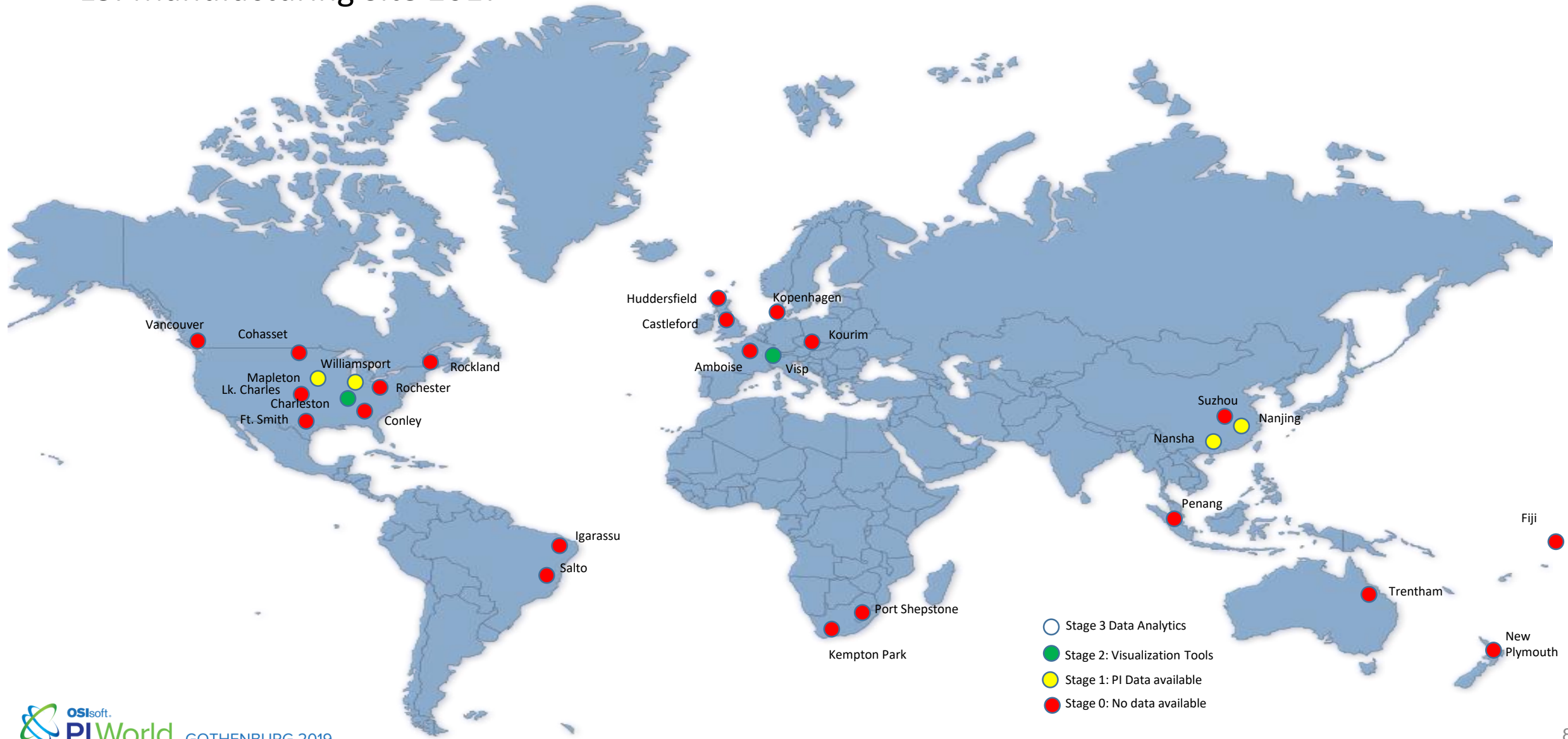


Productivity Improvements via Operational Technology

High Level Assessment: Data Usage



LSI Manufacturing Site 2017



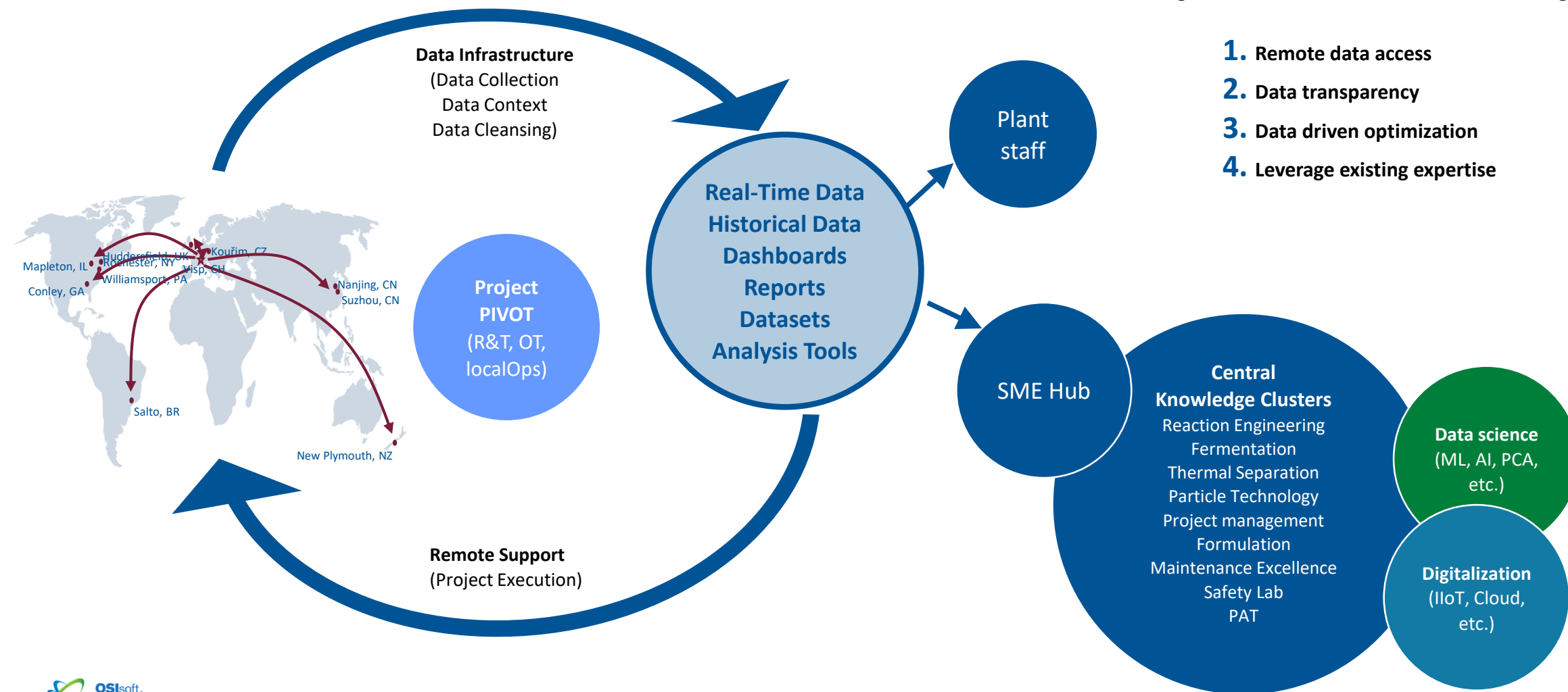
Data Challenges in a global Organization

Lonza LSI operations consists of a distributed production network



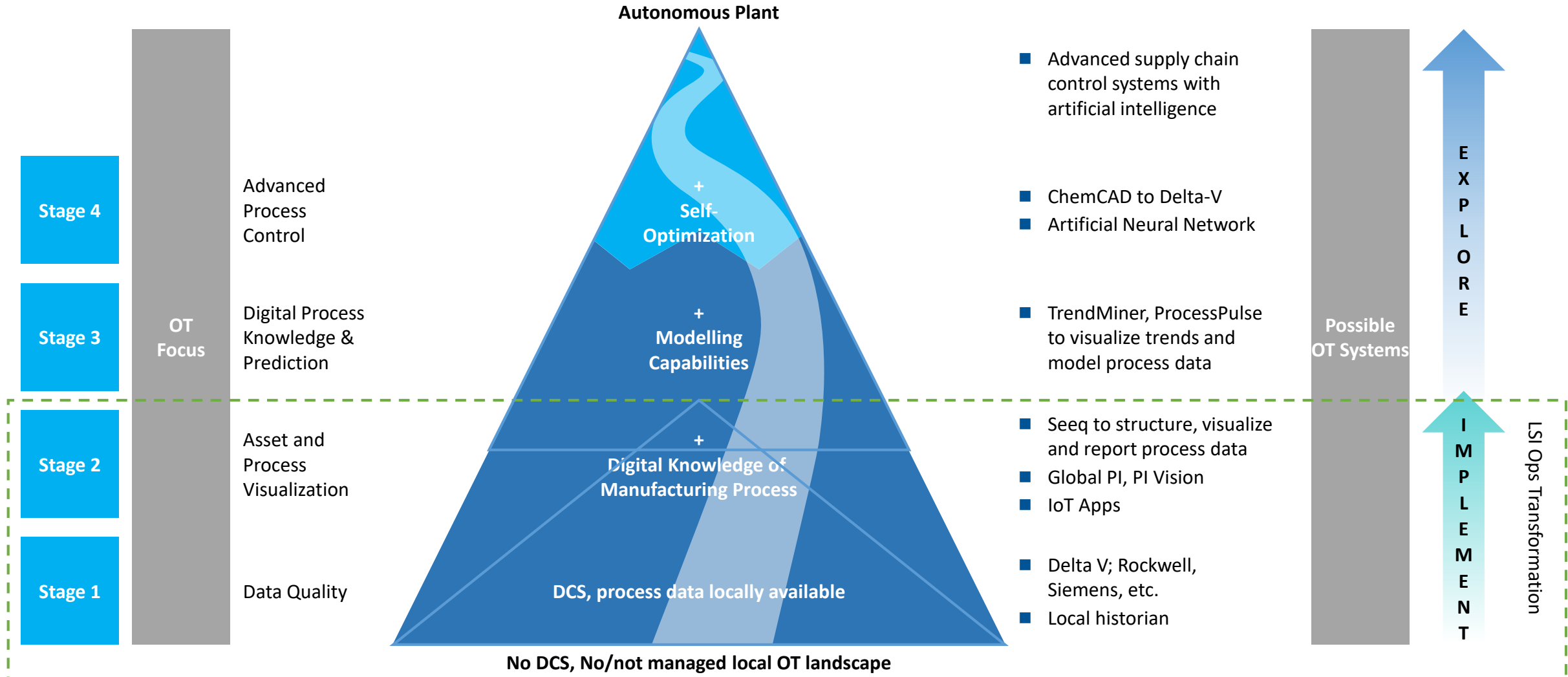
Digitalization offers a solution to this challenge

1. Remote data access
2. Data transparency
3. Data driven optimization
4. Leverage existing expertise



Digitalization Roadmap

A Stage Gate/Maturity Level Approach



Digitalization Roadmap



LSI Operations Digitalization Pyramid: Handling the fragmented production landscape

What is the strategy?

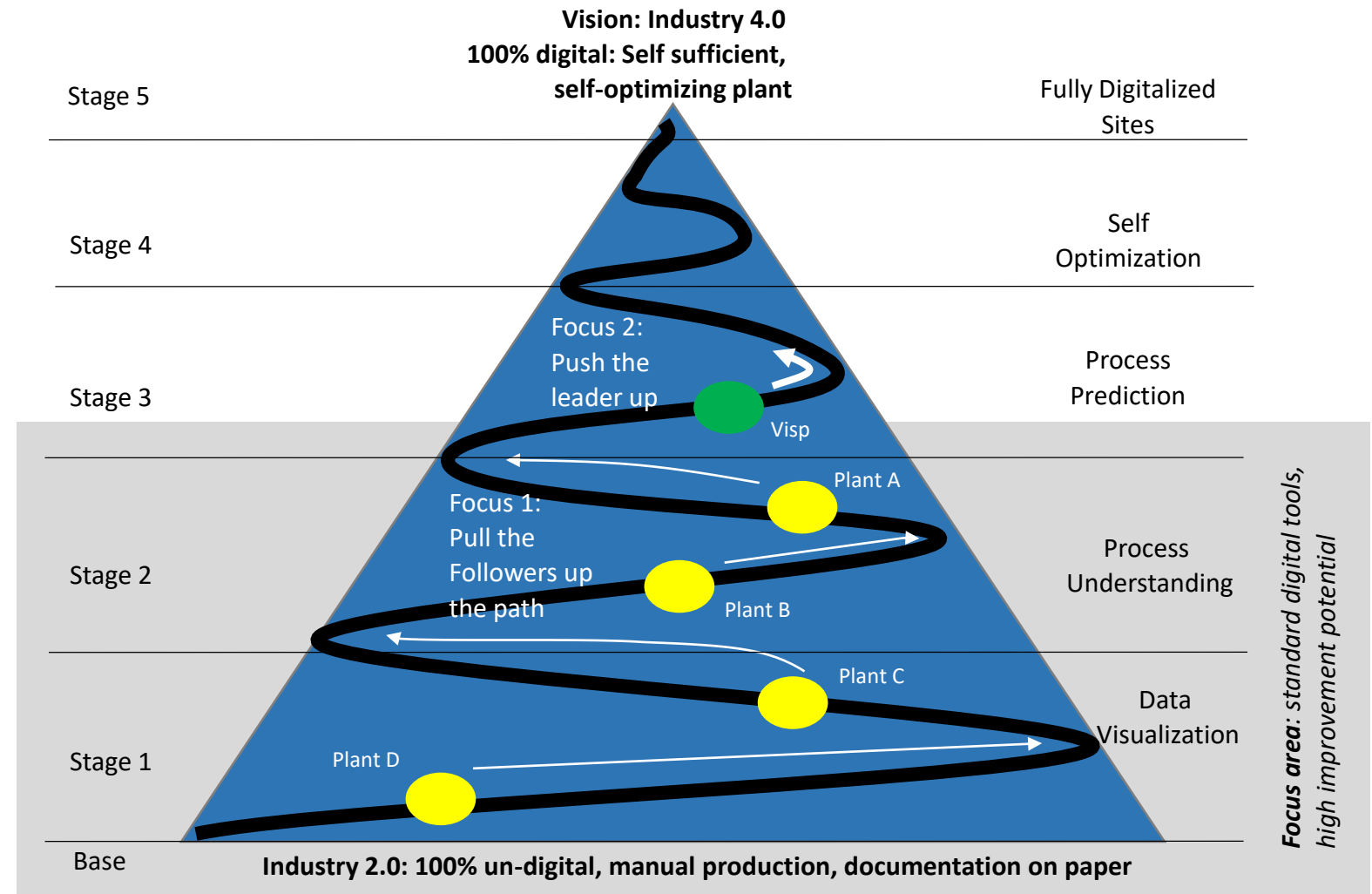
- Build on local basis
- Potential driven implementation
- Support from global teams

... and why this approach?







- Reflect the business needs
- Clear commitment from site
- Effort is linked to financial benefit

...and the other sites?

- Focus on high financial benefits
- Other drivers: quality or safety



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Visualization Tools

Situation in 2015



- Owner of the application gets retired
- No support for new plants: Know-how missing
- No upgrades to newer Versions of Excel
- Difficult to maintain hundreds of Excel sheets
- Individual installations for PI-Excel Admin + PI SDK
- Huge Excel files with lot of data not easy to share
- Data Integrity problem with local data storages
- Connection only to one PI-Server







Evaluation of new Visualization Tools

Requirements

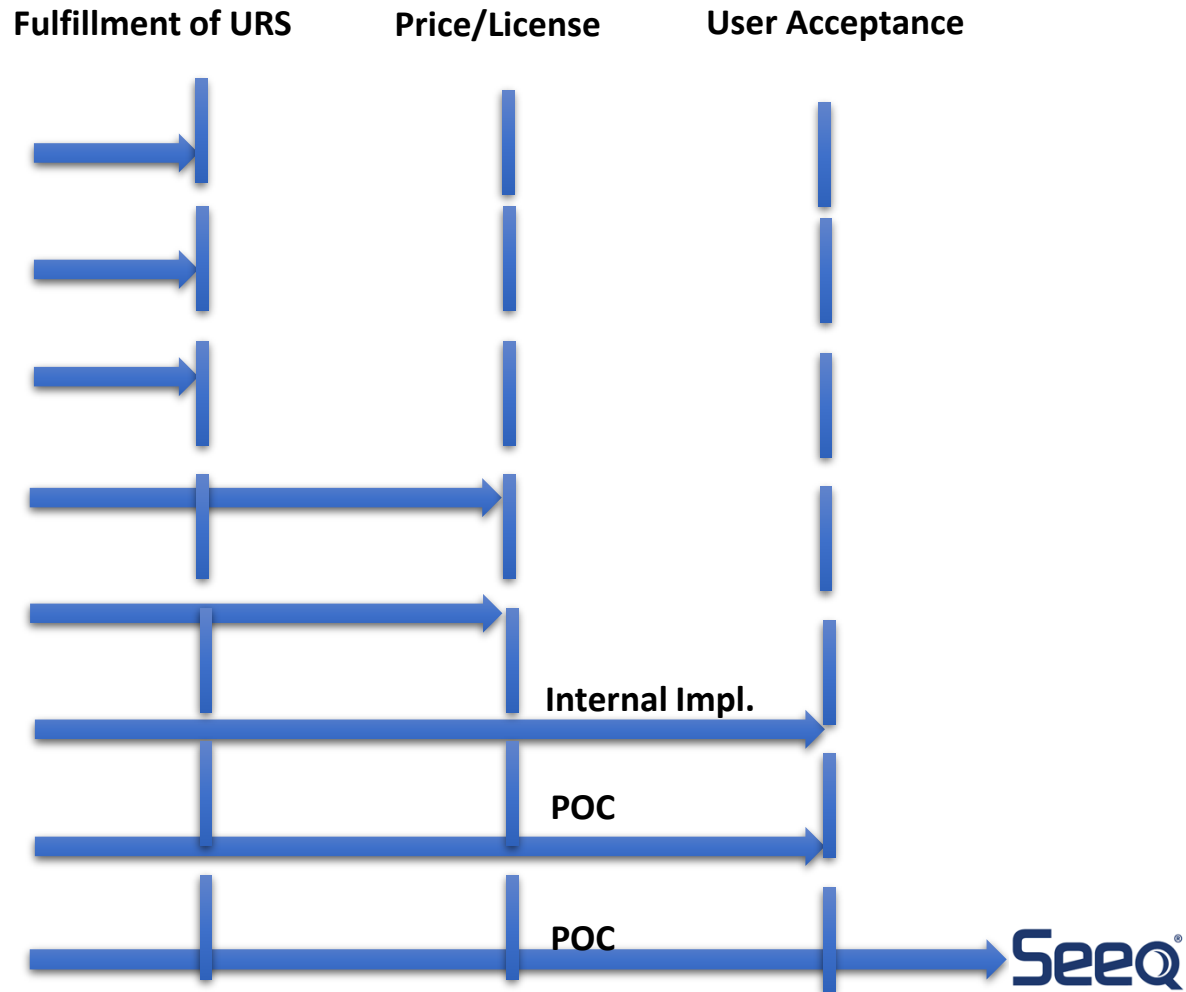
- Batch recognition based PI-Tags, SPC table..
- Automatic or manual recognition of unit operations
- Gantt charts for one reactor; starting point can be chosen freely
- Multi batch and trend overlay
- Calculate durations of different unit operations
- Quickly identify unit operations with the biggest fluctuations
- Visualization and calculations of continuous processes
- Easily customizable via drop-down menus
- Fully integrated with OSIsoft Infrastructure (AF, EF...)



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-  Data Infrastructure
-  Productivity Improvements via Operational Technology

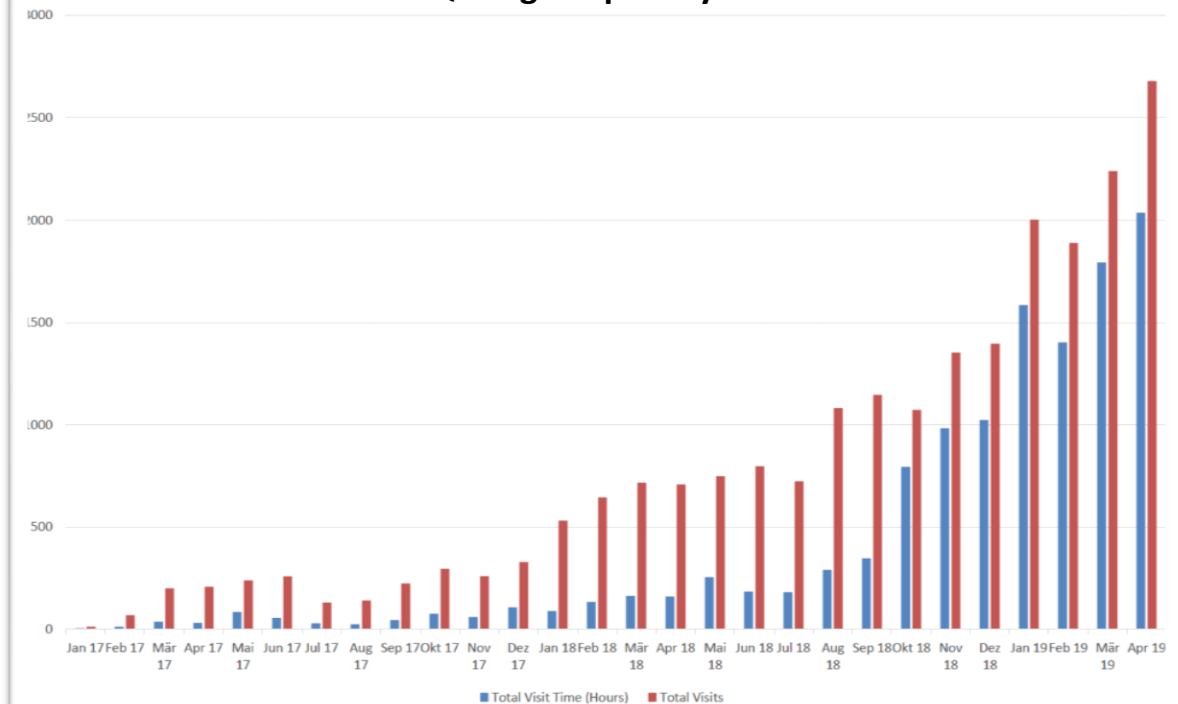
Evaluation of new Visualization Tools



After 3 years with Seeq:

- > 400 Users
- 10 Lonza Sites
- > 150 different Processes
- > 7500 Dashboards
- 12 PI-Servers connected
- 6 AF DB connected

SEEQ Usage Report by Month



Seeq Survey

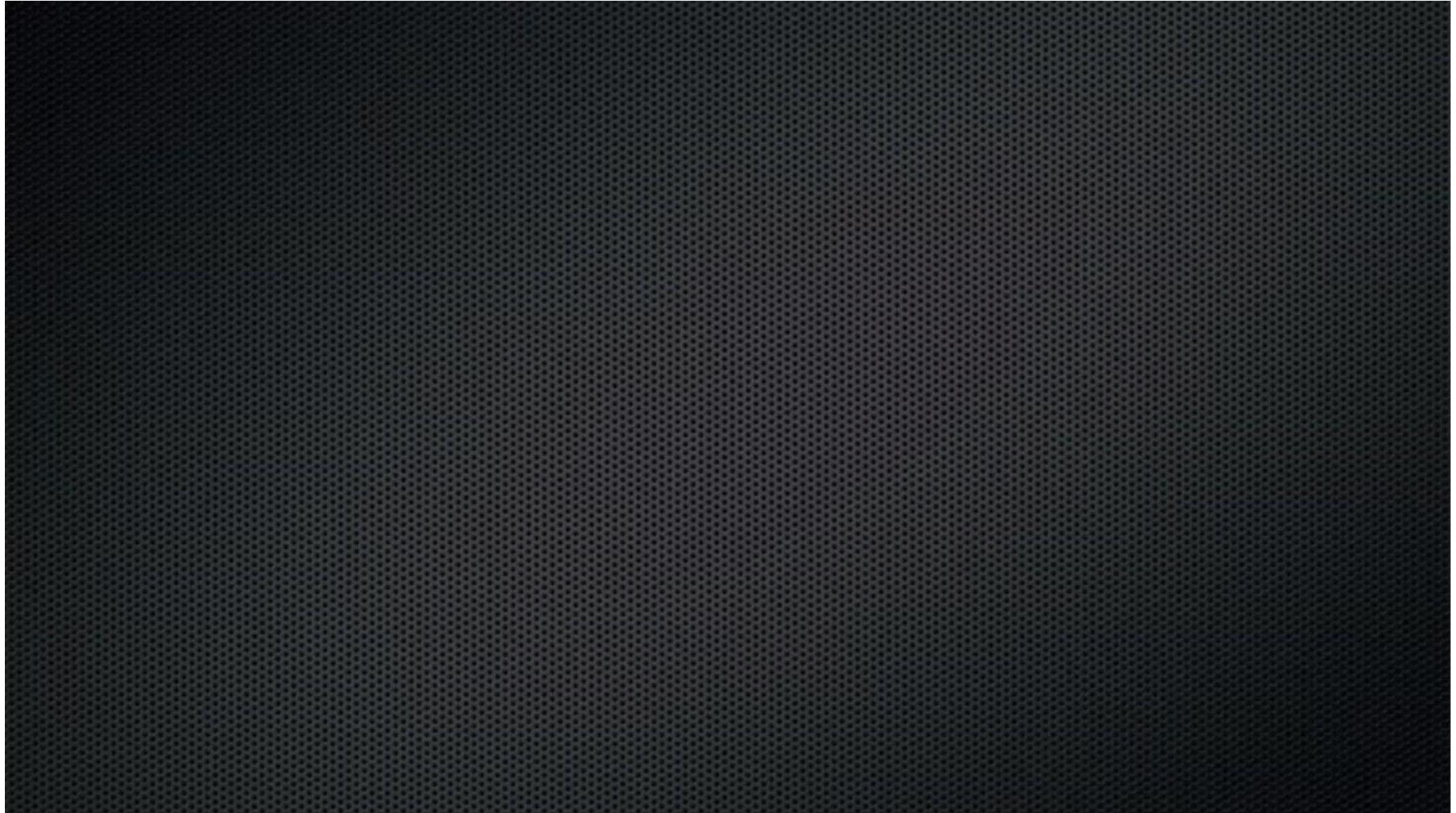
Advanced Analytics for Process Manufacturing Data









- 95 % of users are satisfied with Seeq.
- Largest application is process monitoring and optimization.
- approx. 15'600 hours time savings in one Lonza site per year
- 1-10 % Yield increase
- Prevention of faulty batches



User Stories

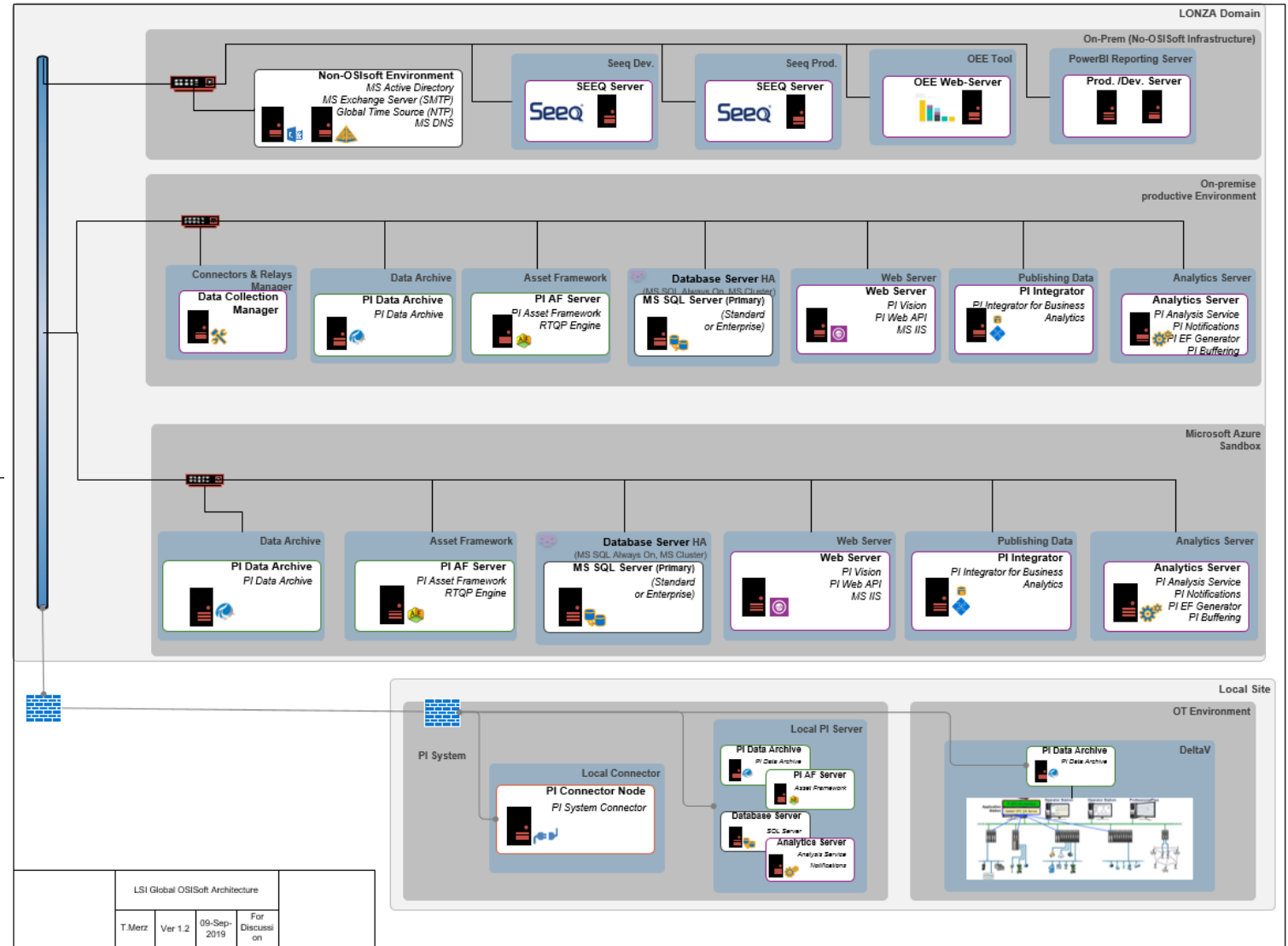
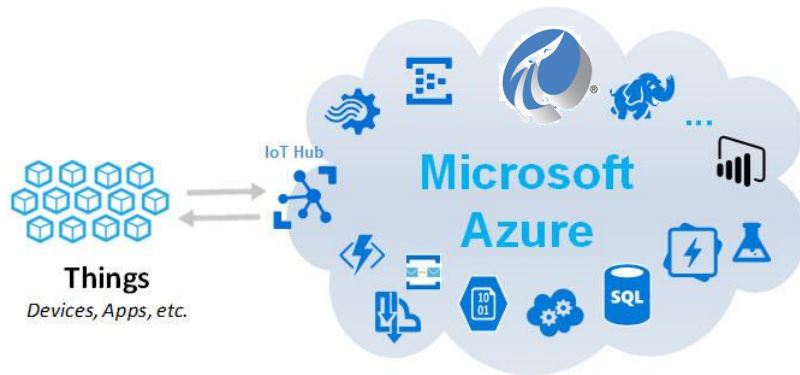


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Data Infrastructure

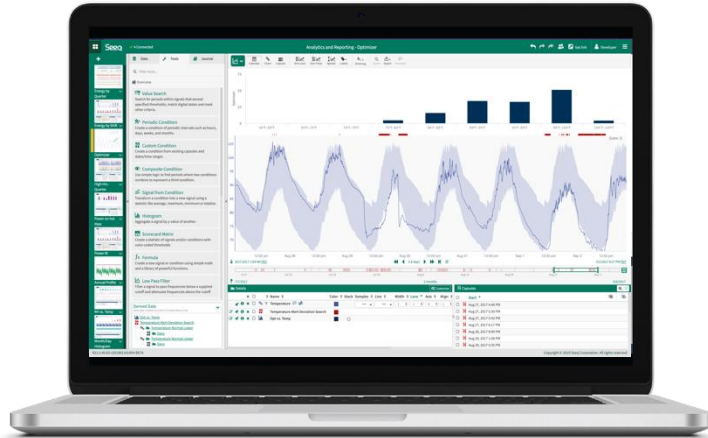
Data availability and accessibility are a key pre-requisite



Seeq Data Connectivity with OSIsoft PI



Seeq Workbench: Analyze



Seeq Organizer: Publish

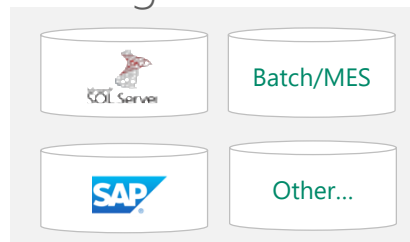


Seeq Server

OSIsoft PI



Mfg. Context



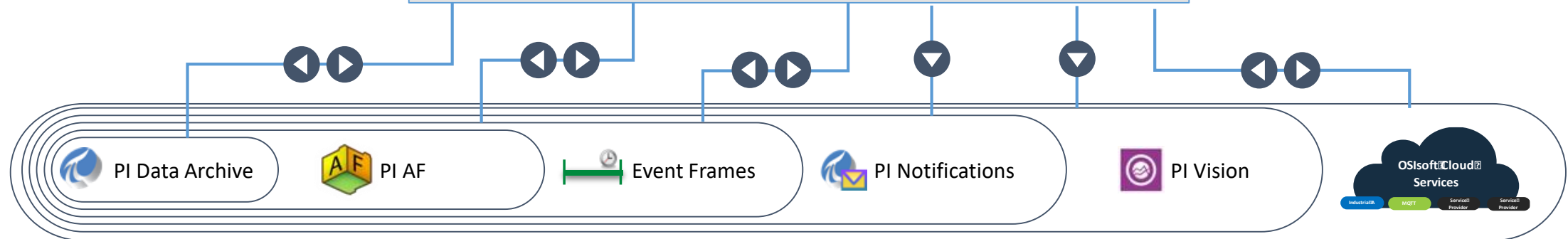
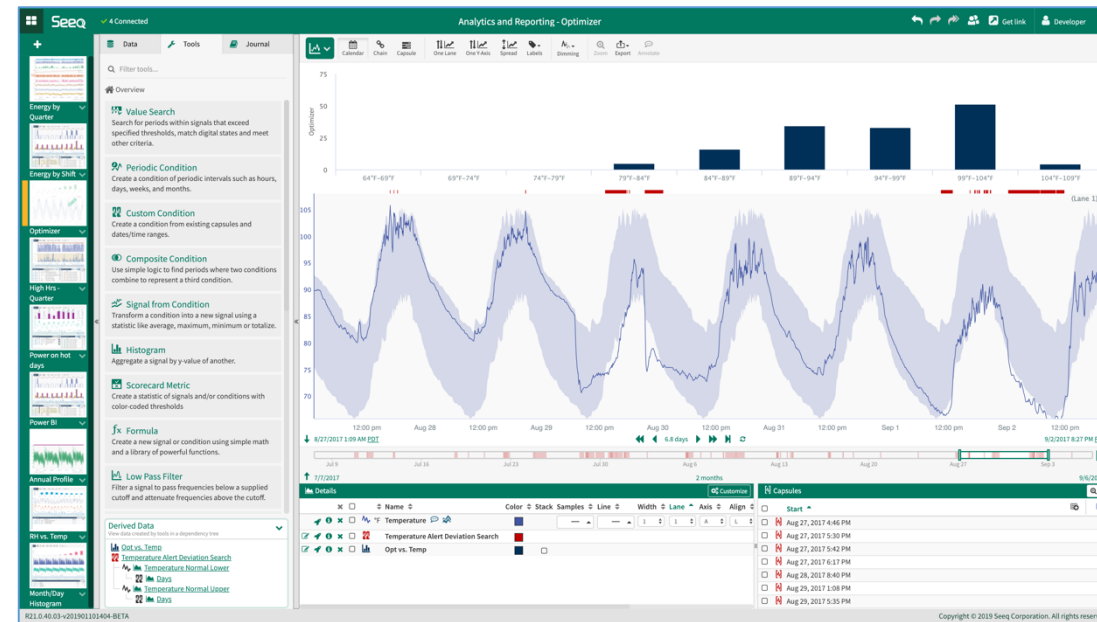
Cloud/IIoT



On-Premise or in Cloud
SaaS Option on Azure

On-Premise or in Cloud
1 or many sources
Time series AND context
Data not moved/copied

OSIsoft PI System Integration with Seeq



Seeq and the OSIsoft PI System



Seeq®

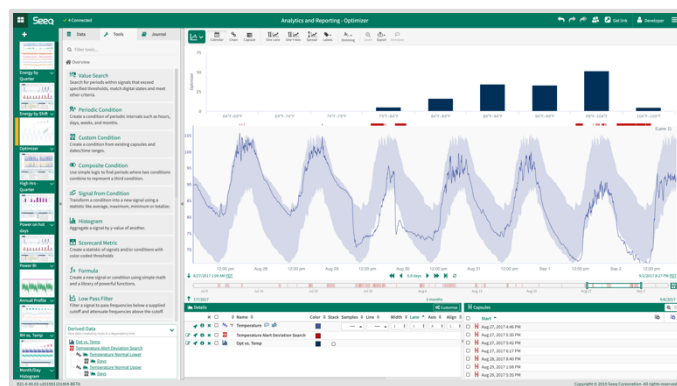
Seeq®

Seeq®  OSIsoft

Advanced analytics application

Seeq benefits for OSIsoft Users

Seeq & OSIsoft: Better Together



Integrates with PI System Features



PI Data Archive



PI Vision



PI Notifications

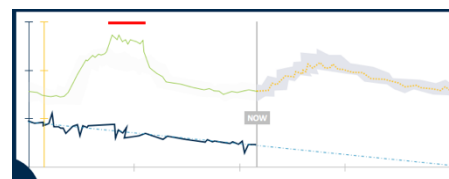


PI AF

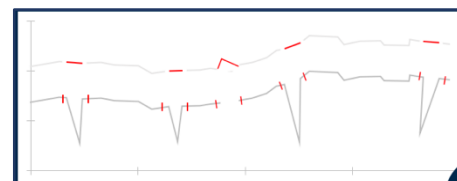


Event Frames

Predictive Analytics



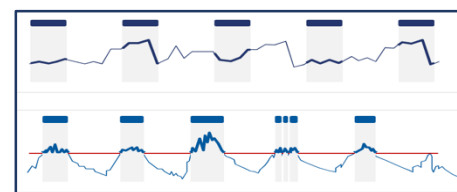
Data Cleansing



Reporting



Ad Hoc Contextualization



- High performance PI System and self-service analytics for faster insights and decisions
- Get more value from OSIsoft PI System investment in data archive, AF, EF, etc.
- No duplicating or copying of source of record in PI System
- Shared path to the cloud with OSIsoft Cloud Services

Seeq Benefits for OSIsoft



Better together!

High performance PI System
and Seeq advanced analytics for insights

Increase OSIsoft PI investment value

AF & EF integration, publish to PI Vision,
high value in PI Notifications

Low touch for OSIsoft PI System admins

No duplicating or copying of source of record

Shared path to the cloud

Seeq with PI servers on AWS or Azure,
integration with PI Connector data sources



DEMO

8 Connected

Excursions from Reference Profile - Monitor Fermentation Temp Curve
Get link
Brian

Data
Tools
Journal

Viewing
Edit

Excursions from Reference Profile

Create a reference profile to use for monitoring temperature at the end of fermentation in order to determine if process is on-track for product quality

Steps

1. [Start](#) with Fermentation Batches as conditions in Seeq. Identify the Diacetyl Rest phases at the end of each fermentation.
 - View the [Temperature](#) and [Diacetyl Level](#) for this analysis
2. Review quality data during batches to [determine "good" batches](#) to use as inputs to a temperature curve
 - [view with cursors](#)
3. Create a [reference profile for the average temperature during Diacetyl Rest](#)
4. Create [upper and lower temperature limits during Diacetyl Rest](#) based on standard deviation
 - View the temperature curves in [Capsule View](#)
5. [Apply these limits to the most recent batches](#) in order to identify batches that deviate from the acceptable limits

Calendar
Chain
Capsule
One Lane
One Y-Axis
Spread
Labels
Dimming
Zoom
Annotate

Chain View shows each capsule 'back-to-back' for easier comparison, eliminating the time periods between capsules.

Add a condition to the trend to utilize the chain view.

9/25/2018 12:17 PM CDT
6 months
3/27/2019 1:21 PM CDT

Oct '18
Nov '18
Dec '18
2019
Feb '19
Mar '19

9/25/2018
6 months
3/27/2019

Details
Customize

Name
Lane







Comments
0

R21.0.41.03-v201905231603-BETA
Server load: 0%

PIWorld
 GOTHBURG 2019

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CHALLENGES

- Manage large Excel files with data integrity issues
- Deploy, support, and maintain analyses for 100's – > 1000's users
- Calculations on data from multiple PI Servers (in Excel)

SOLUTION

- Seeq software implementation
- Easily create batches from Event Frames, mathematically, or by drawing on screen
- Batch overlays with multiple trends
- KPI reports for durations and fluctuations of unit operations
- Visualization and calculations of continuous processes

BENEFITS

- ~15.600 hours time savings in one Lonza site per year
- 1-10% yield increase
- Prevention of faulty batches
- Improved process monitoring and optimization

Questions?



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the **microphone**

State your
name & company



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mobile agenda for survey

