

MAY 17 2022

PI System and Seeq Better Together

Well proven by 100's companies

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AVEVA

Agenda

- Seeq Overview
- PI System and Seeq: Better Together
- Data Integrity, Managed
- Capabilities and Use Cases
- Key Takeaways

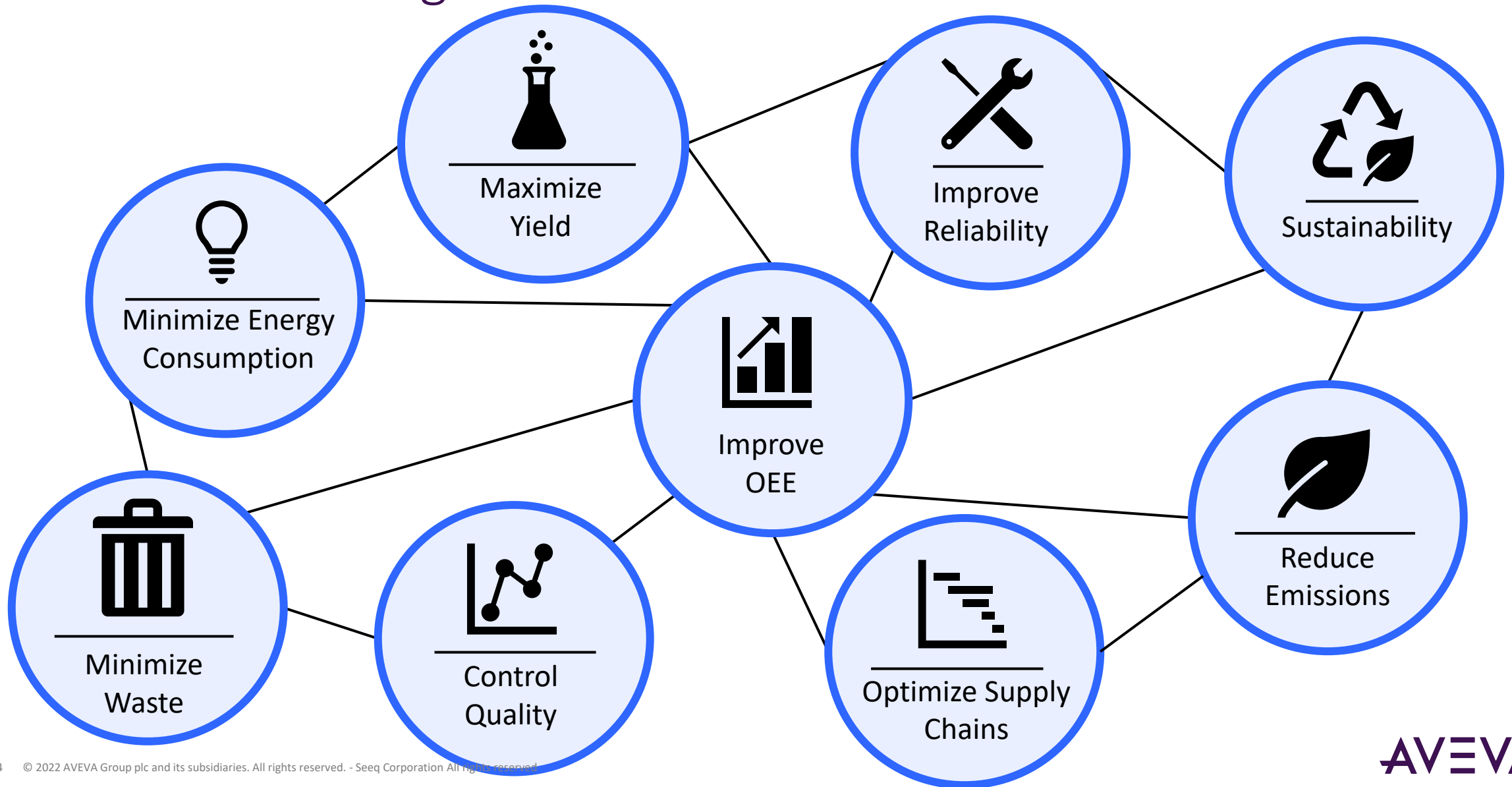
About Seeq

Highlights

- Founded 2013
 - Raised \$115M to date
 - 230 employees
 - Partners in 40 Countries
- >250 enterprise customers in critical industries; oil & gas, pharma, chemical, power gen, water, etc.
- 95% of revenue from software subscription licenses
- AWS Industrial Competency Partner and Microsoft Azure 2020 Partner of the Year Finalist

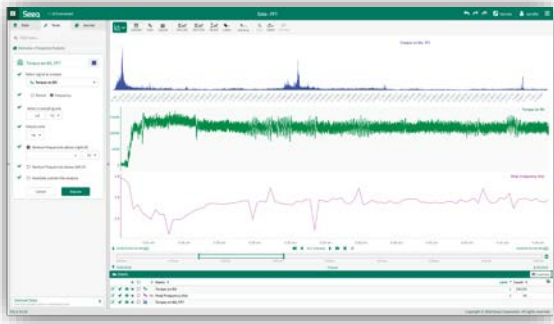


Business Challenges



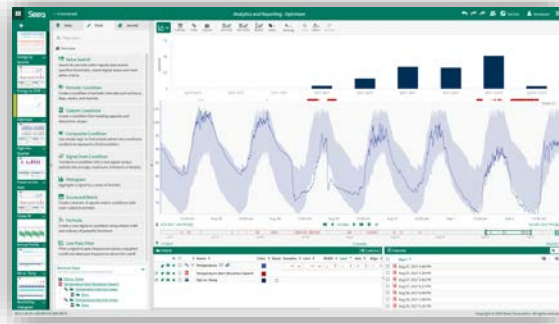
What is Seeq? Advanced Analytics for Time-Series Data

Trending



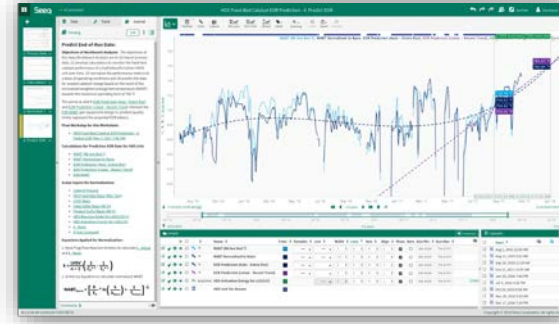
Advanced Analytics

Predictive, Descriptive, Diagnostic

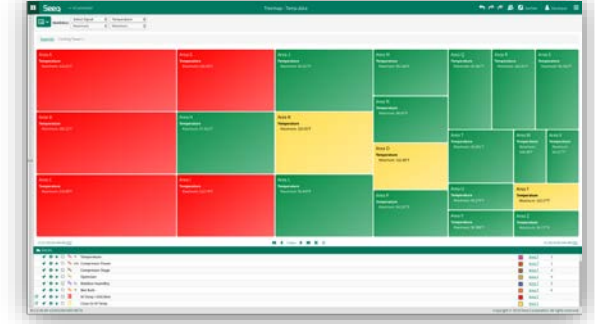


Collaboration

Knowledge Capture, Prescriptive

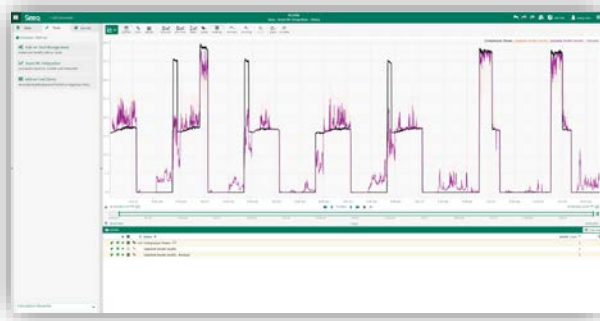


Asset Predictions & Monitoring

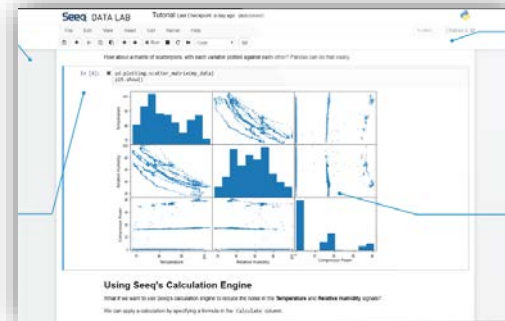


Algorithm Delivery

Add-On Tools

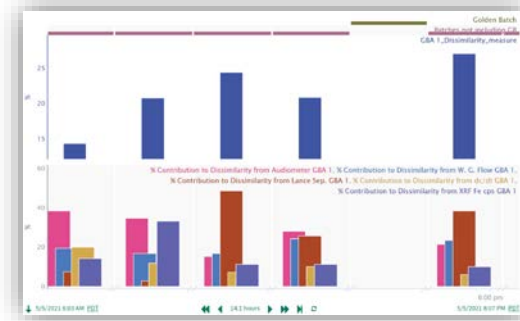


Python Scripting



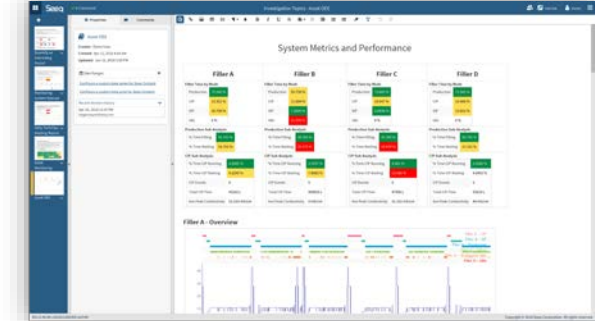
Statistics

Multivariate, SPC



Custom Applications

OEE, API



Time Series & Relational
Many sources, many types,

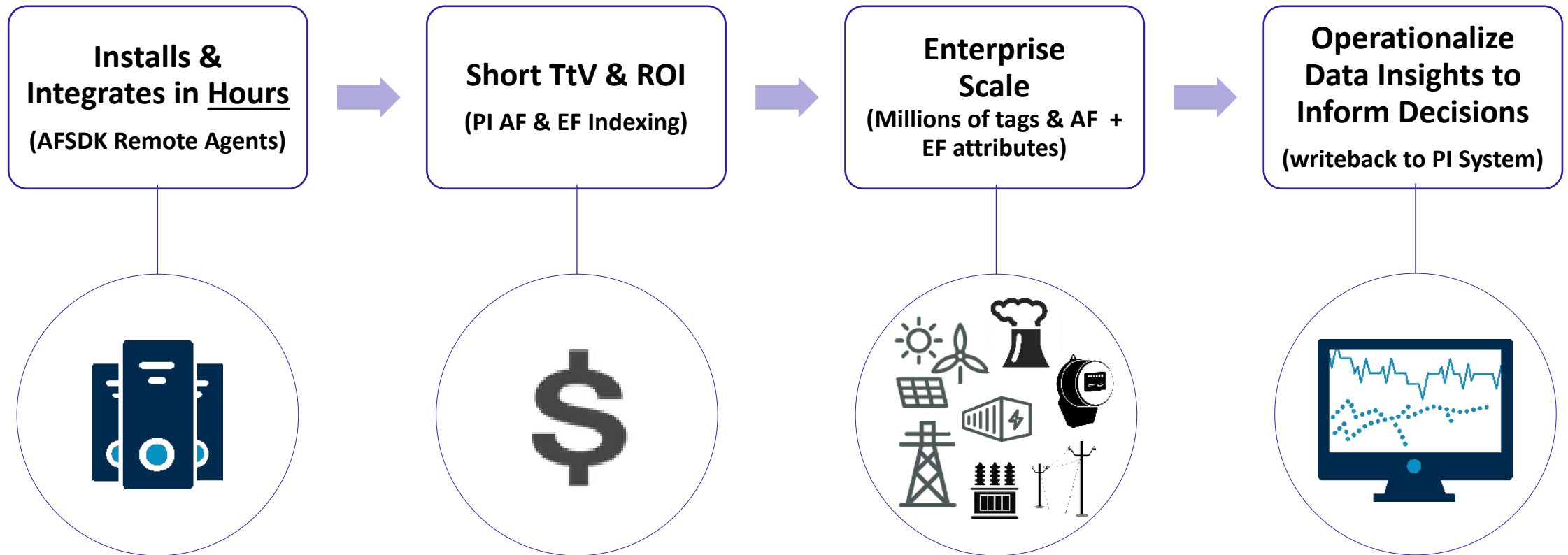
Seeq CORTEX

Single log on, administration,
security & something

Access from anywhere:
SaaS on Azure and AWS

Utilizing Seeq with your PI System infrastructure

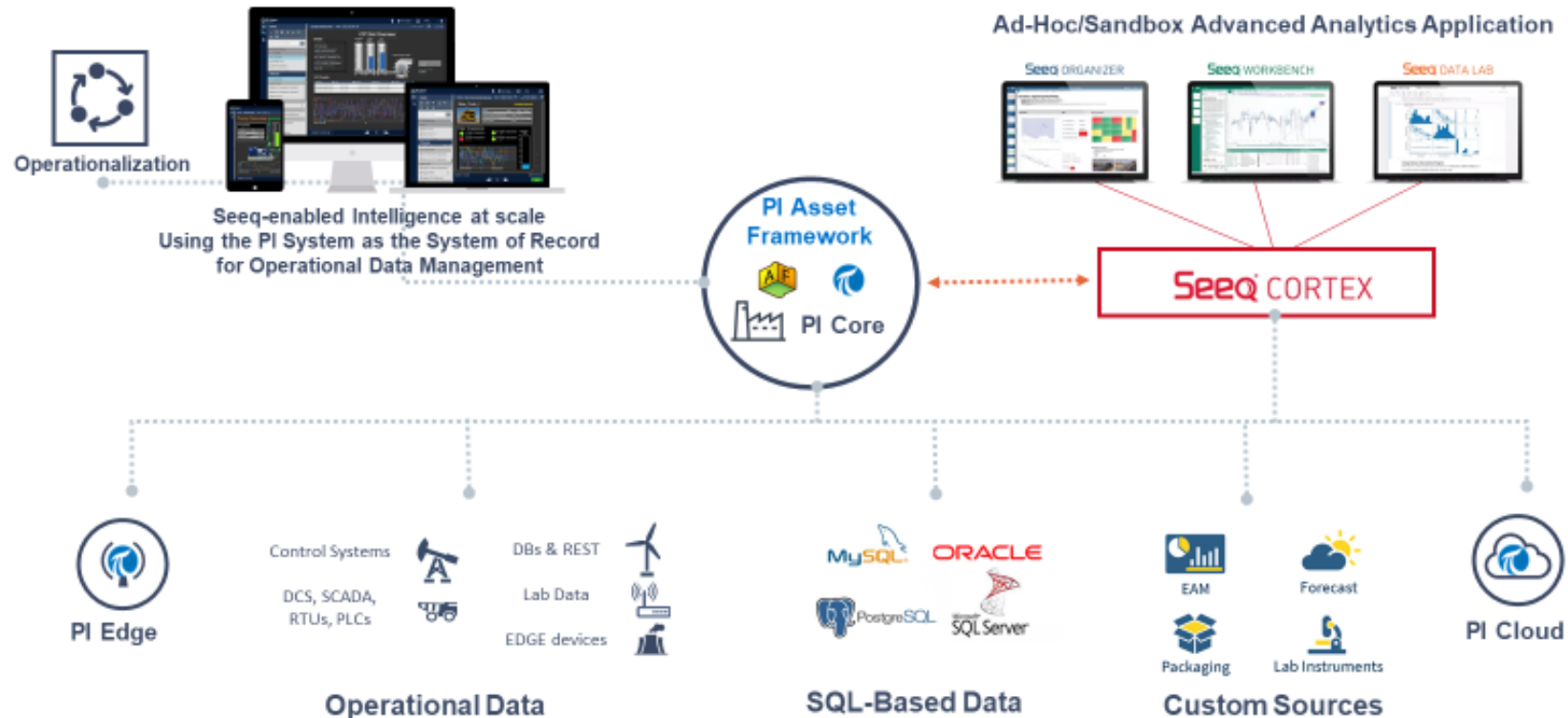
Seeq is an advanced analytics application purpose-built for time-series data that empowers engineers, SMEs & Data Scientists with self-service tools to collaborate & improve operational performance



Conquer digital challenges with innovation and co-operation

Presented by Aveva in 2021

Flexible Complementary Capabilities – PI AF as the integration point



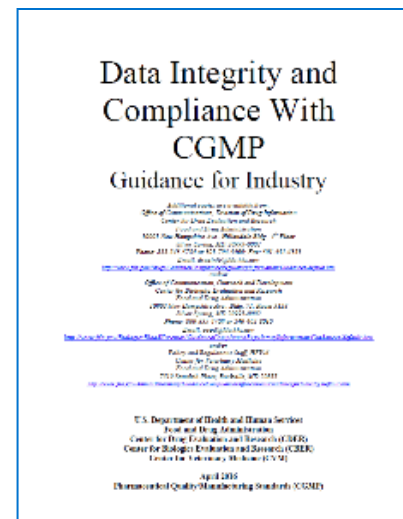
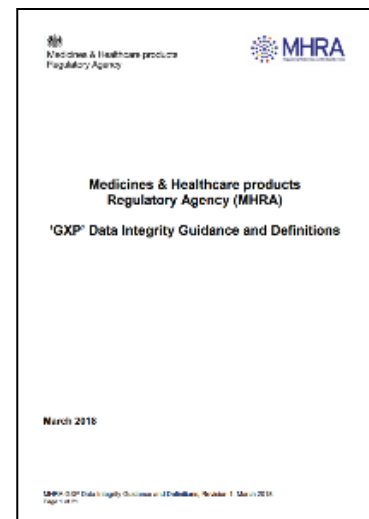
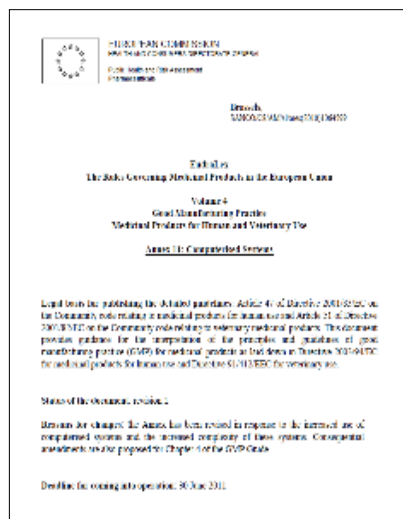
It is all about Data Integrity

There are two types of persons in the world,
those who can extrapolate
from incomplete and poor data

Data Integrity – data trustworthiness

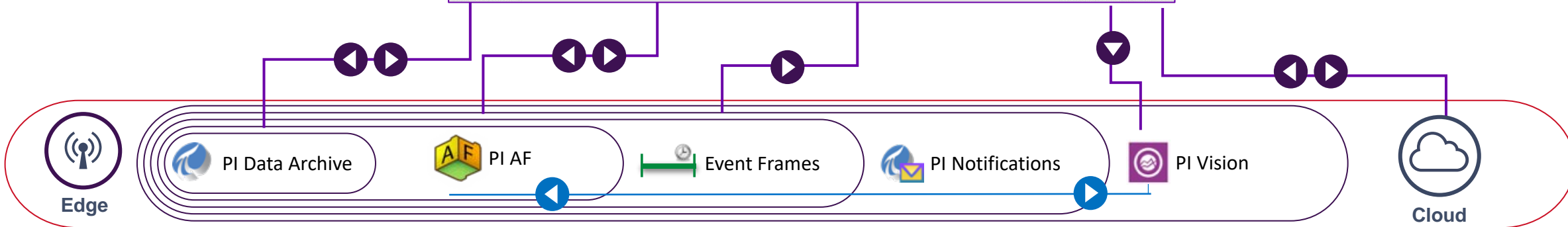
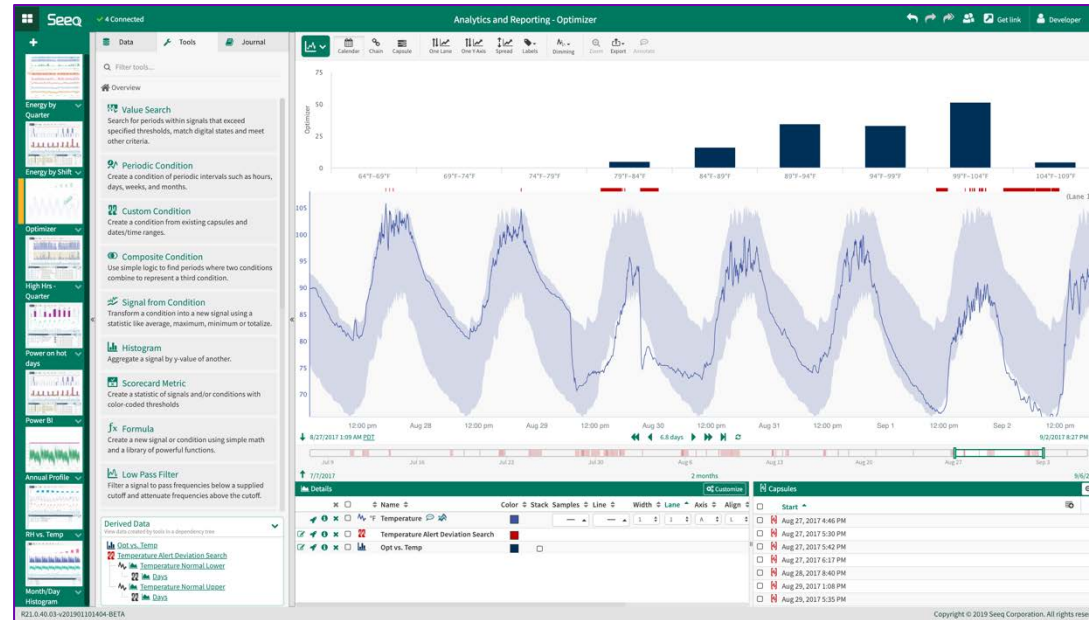
Meta data – data about data

- Data Availability – PI System, OCS/Data Hub
- Data Accessibility – PI AF and PI EF
- Data Quality



AVEVA PI System integration with Seeq

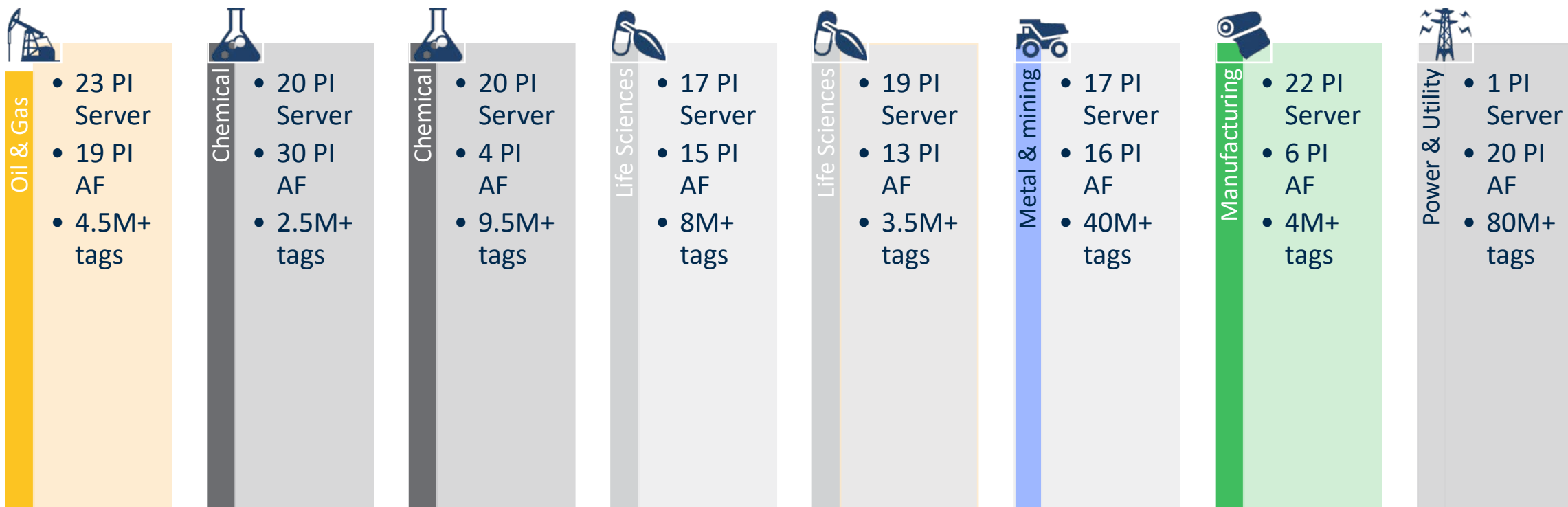
Data stays in PI System



Data accessibility & data availability

PI System secures Data Integrity, Scale and Scope

- Scope – number of data sources connected
- Scale – amount of data collected



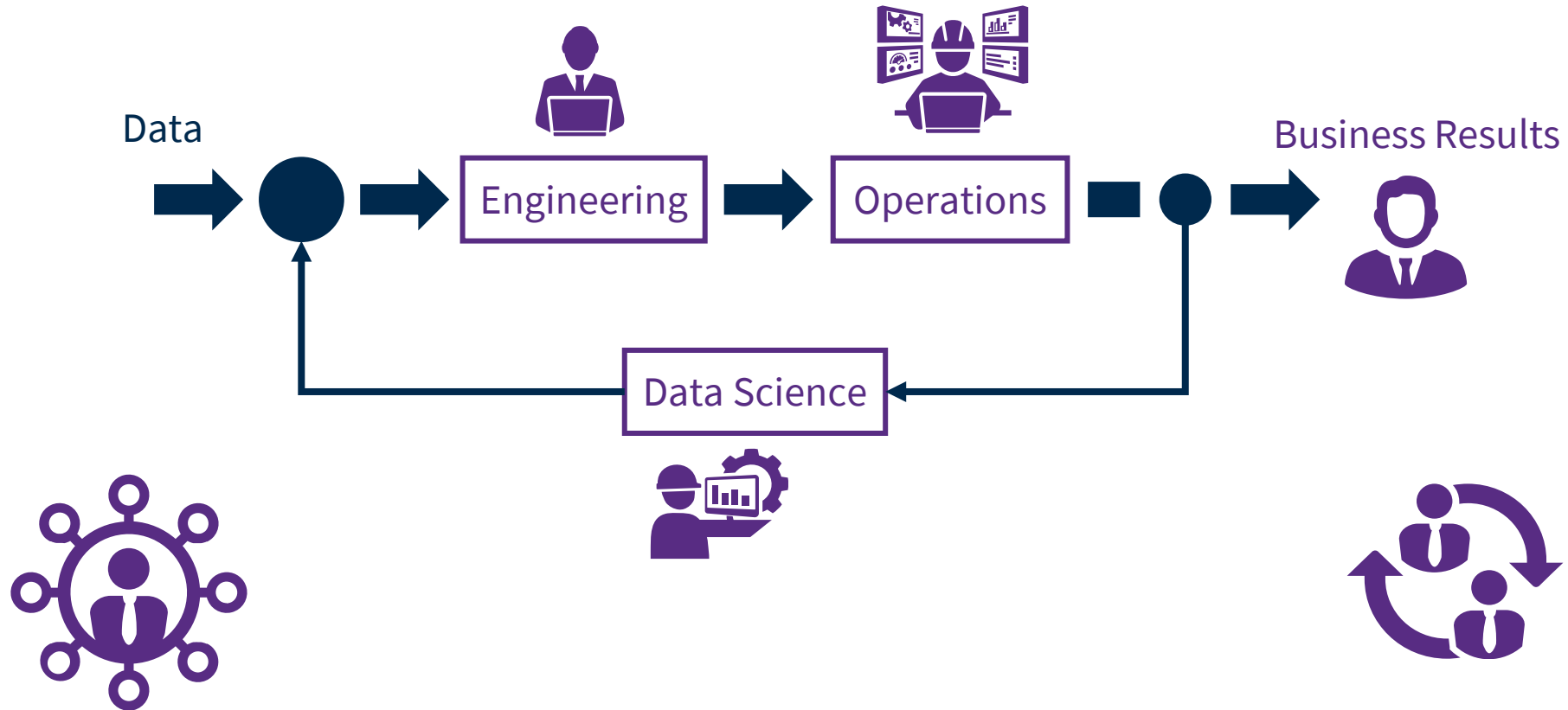
EXTENSION OF THE PI SYSTEM

Data to Value

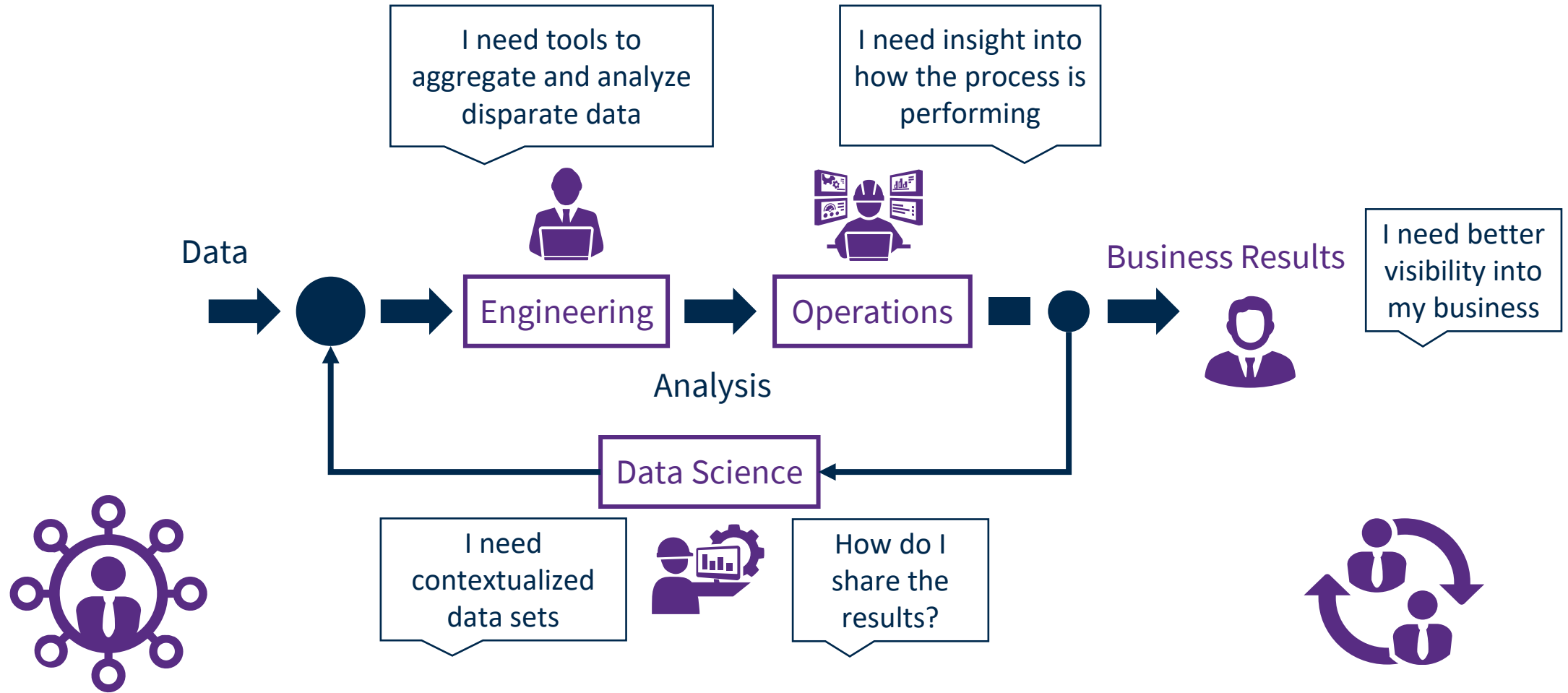
Involving key personas



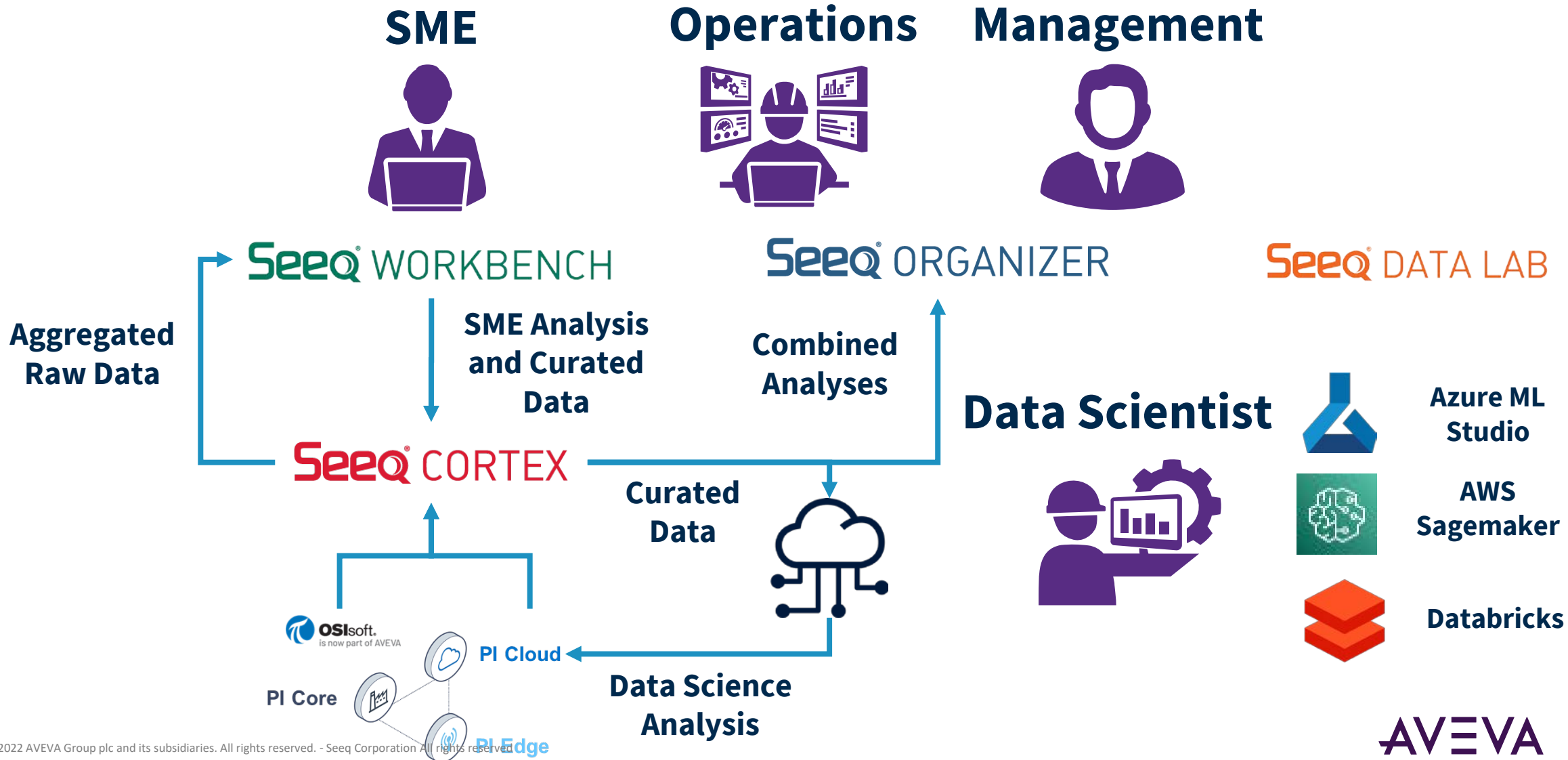
Key personas to move Data → Information



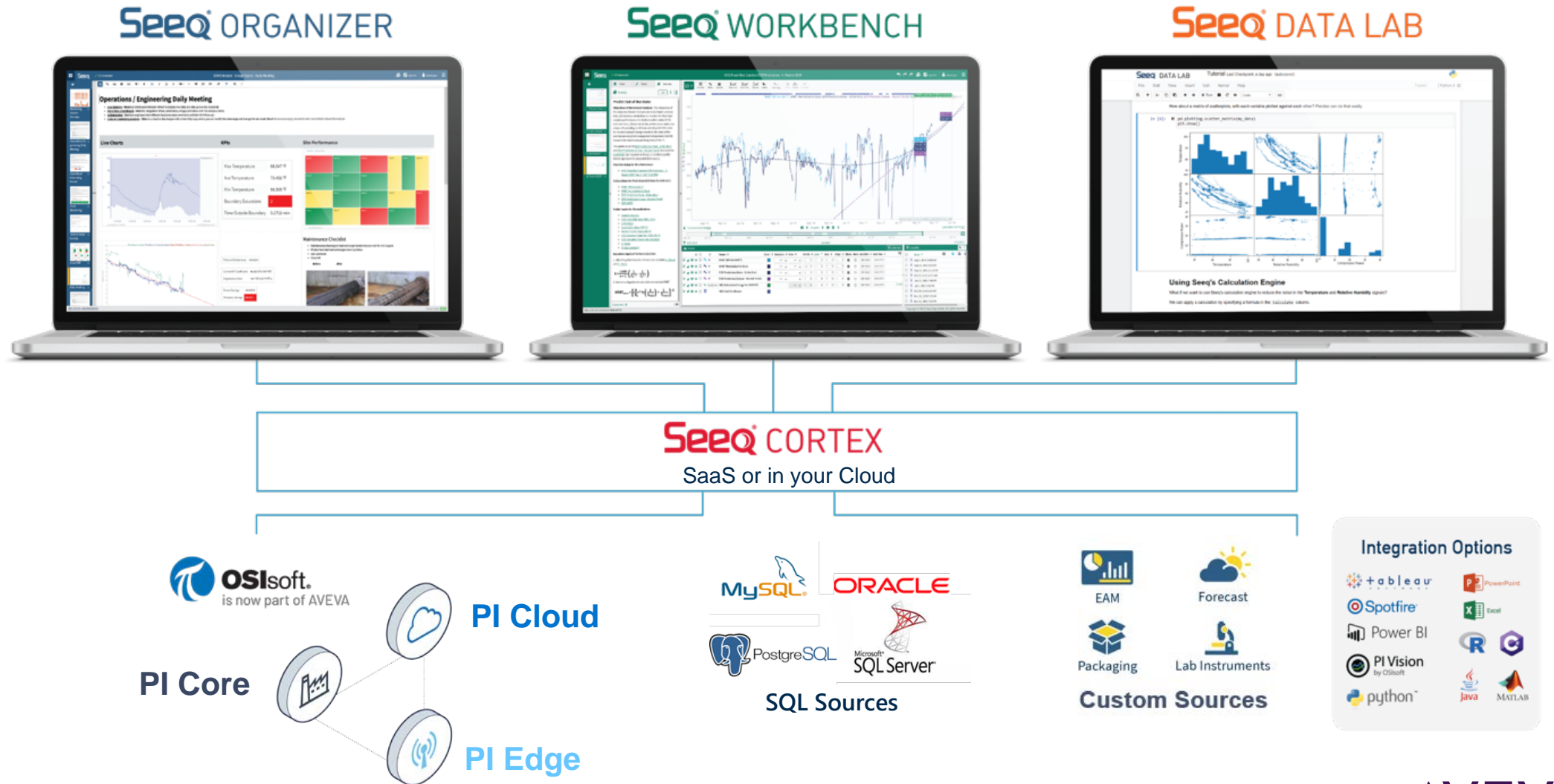
Data → Information → Value



Seeq Closes the Loop

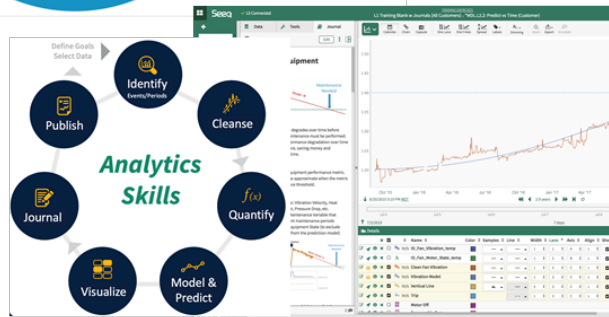
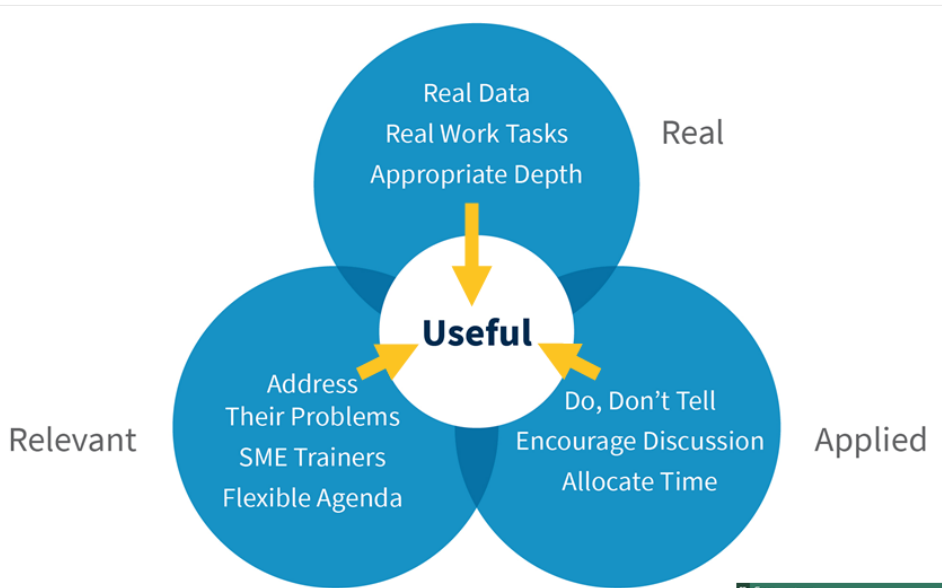


Edge-to-Cloud Operational Data Management at Enterprise Scale

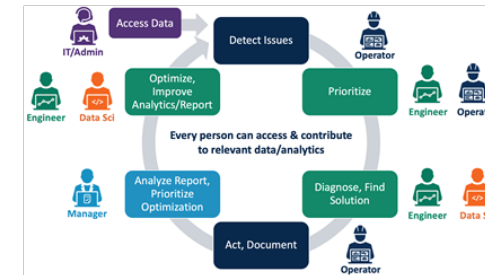


Seeq helps customers skill up their workforce to achieve value

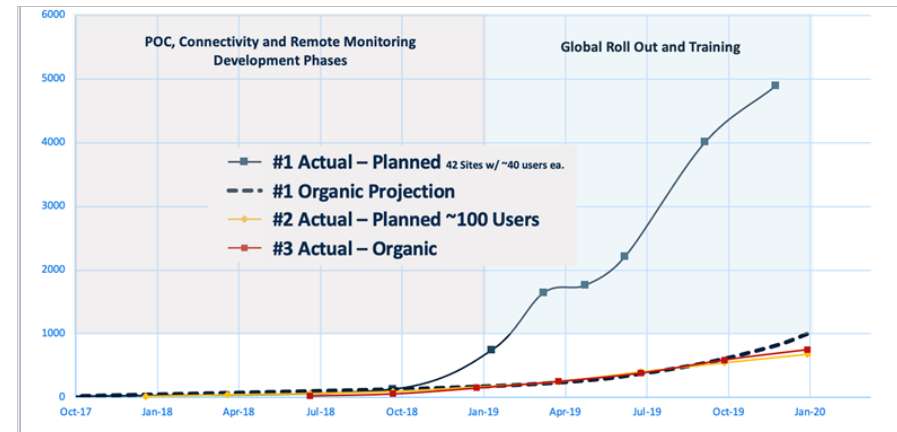
Real, Industry-Relevant, Applied



Role-based Curriculum



Effective Rollout Planning



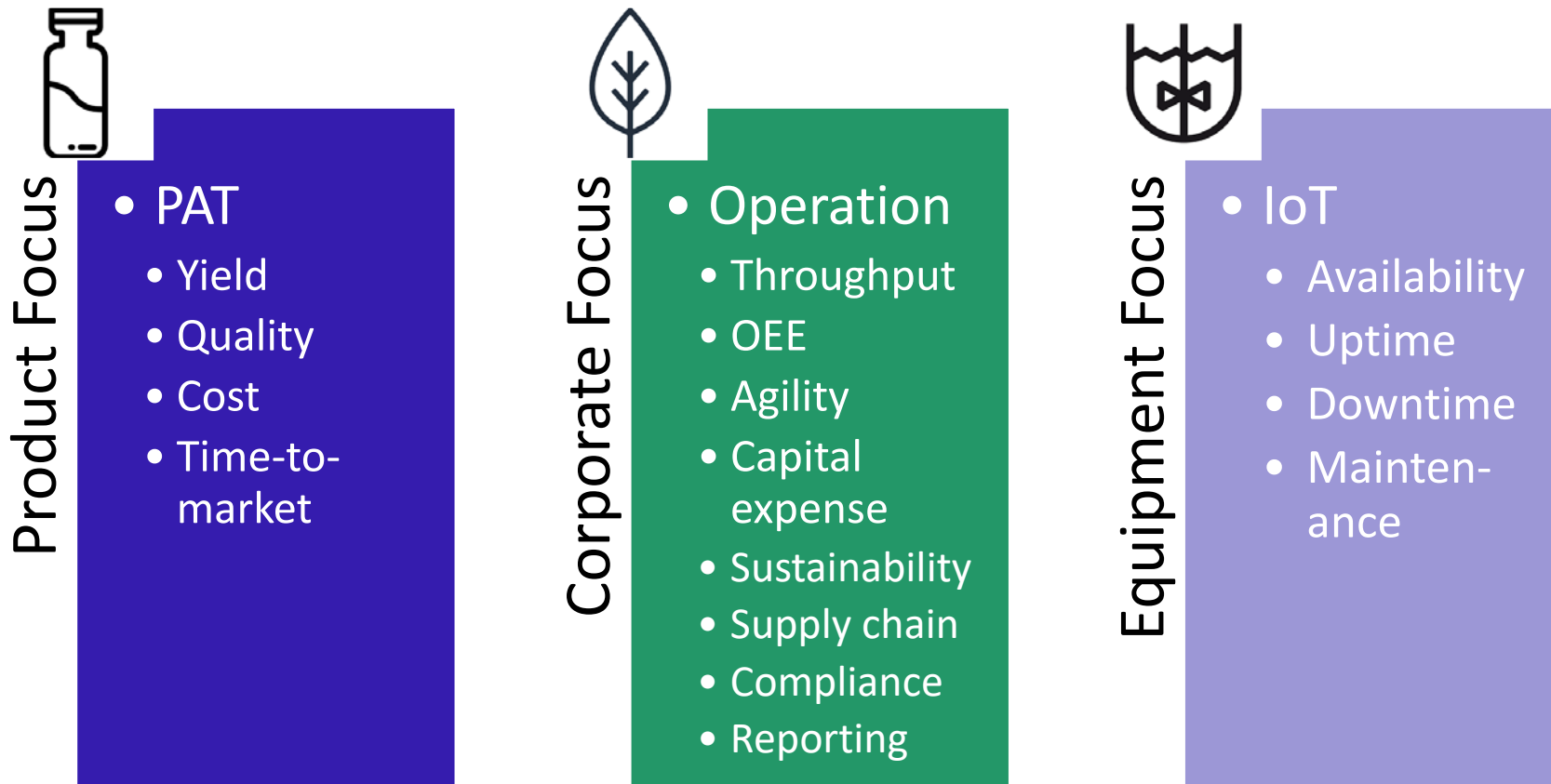
EXTENSION OF THE PI SYSTEM

Use Cases

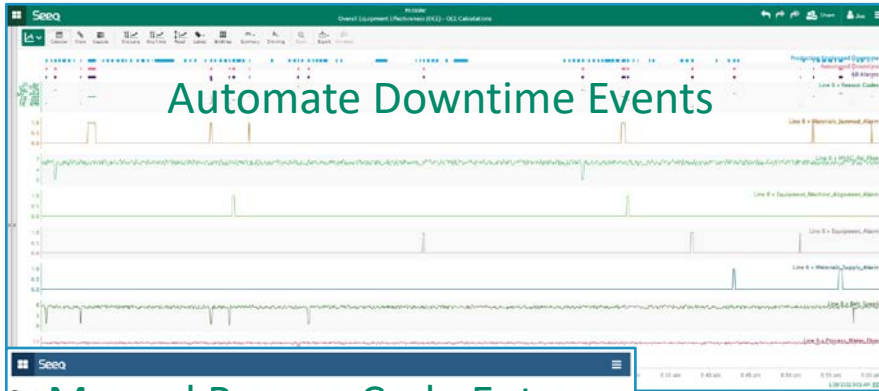


Analytics in three key dimensions

PI System and Seeq address all dimensions

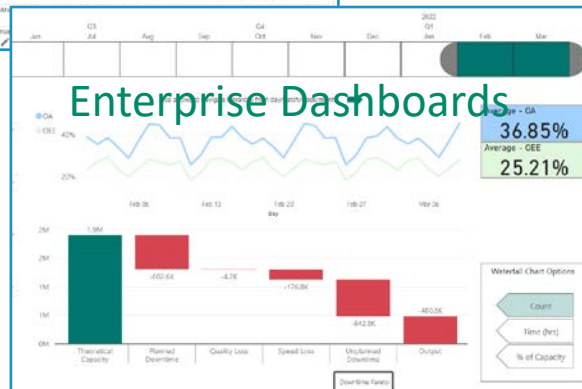


Overall Equipment Effectiveness (OEE)



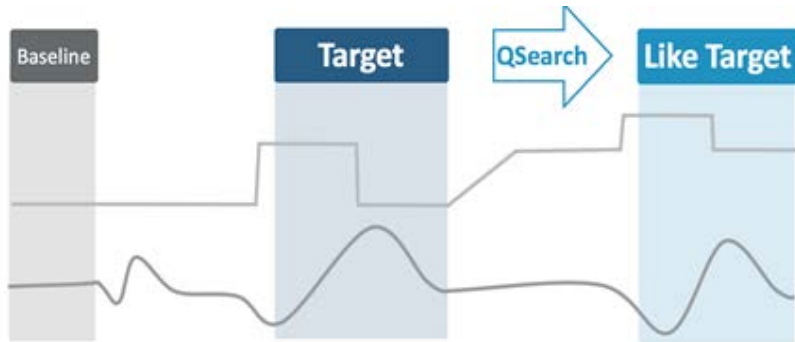
Manual Reason Code Entry

Equipment	Start	End	Reason Code	Author
Line 4	2022-03-22 08:21:05	2022-03-22 08:21:05	Equipment-Not Stoppage-No Action Taken/Countermeasures-No Description	john.human@seeq.com
Line 4	2022-03-21 22:53:35	2022-03-21 22:56:00	Quality-Manual Inspection-No Action Taken/Countermeasures-No Description	stake.carruth@seeq.com
Line 4	2022-03-21 22:32:13	2022-03-21 22:36:50	Equipment-Other-No Action Taken/Countermeasures-No Description	rita.cabell@seeq.com
Line 4	2022-03-21 18:03:00	2022-03-21 18:18:15	Quality-Validation-No Action Taken/Countermeasures-No Description	jon.parker@seeq.com
Line 4	2022-03-21 20:48:35	2022-03-21 20:52:11	Quality-How Material-No Action Taken/Countermeasures-No Description	bruce.carruth@seeq.com
Line 4	2022-03-21 18:43:35	2022-03-21 18:52:23	Production-At	
Line 4	2022-03-21 14:43:00	2022-03-21 14:47:00	Quality-Manual	



- Identifying the top opportunities for improvement to manufacturing productivity can be challenging
- OEE solutions often require specific sensors, are limited in scope to single site metrics, and are restricted in the ability to customize calculations, analytics, and visuals
- Connect data from MES and PI Systems across the world
- Automatic creation of downtime events and assignment of reasons via alarms and process signals
- Interface for operators to manually select reason codes
- OEE and OA calculations with prioritization of top performance improvement opportunities
- Enterprise Dashboards for near real-time and historical OEE metrics with prioritization for improvement opportunities
- Flexible integrated analytics application for continuous improvement projects

Asset performance management in centrifuge



- Centrifuge blockages causing lost production, unplanned shutdowns and loss of revenue as well as safety threats.
- Limited number of tags and data available. Identify issues and/or events in the data that are multivariate and difficult to define mathematically

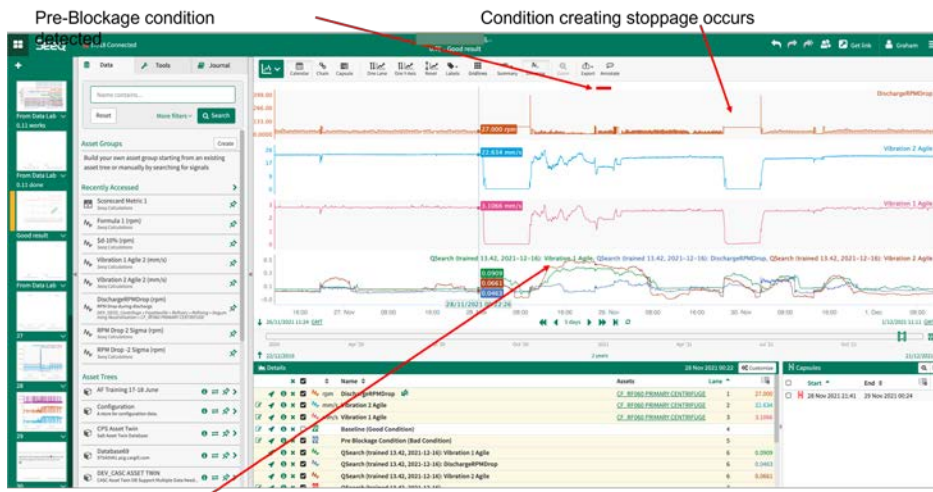


- Leveraging PI System, PI Asset Framework and PI Event Frames to enable scale and scope.
- Vibration sensors, product flow and RPM available
- Seeq and QSearch providing actionable insight and early fault detection of blockages



Enables detection of precursors to events

- Events: failures, unsafe operating states, etc.
- **Helps identify risks and prioritize maintenance activities**
 - Reduces likelihood of catastrophic failures
 - Saves costs due to lost production, repair, and engineering time



Failure probability increased across inputs

Bio-Reactor Design Space Verification



CHALLENGE

- Knowledge transfer from bench to Commercial Manufacturing is a challenge
- During scale-up, Batch Parameters need to be re-evaluated for Large Scale Manufacturing



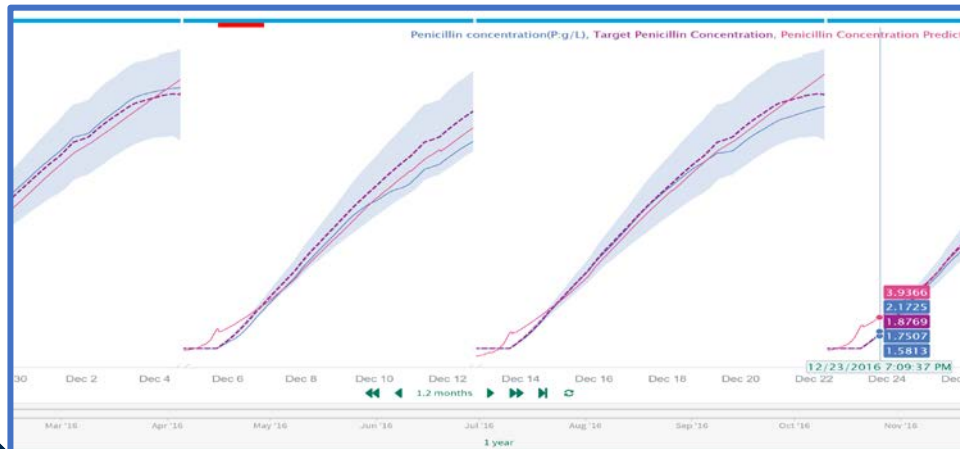
SOLUTION

- Create Production Rate model as a function of reaction inputs/byproducts
- Identify operational boundaries using Reference Profile tool
- Monitor new batches online for process deviations

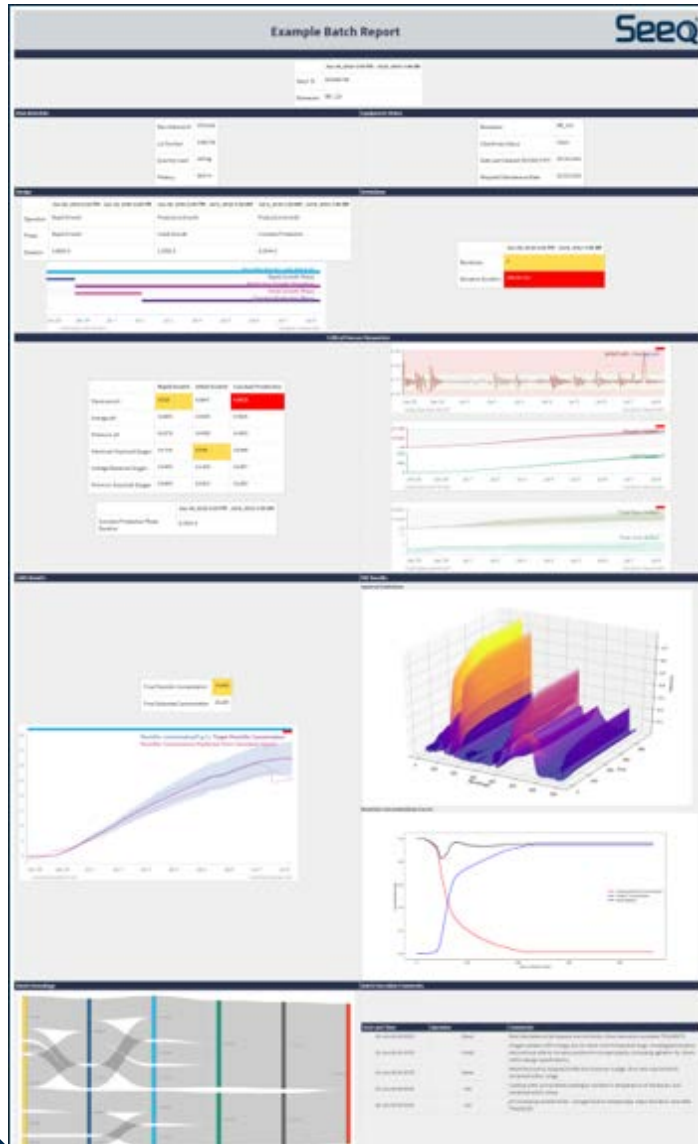


RESULTS

- Identify and correct batch deviations as they occur
- Determine new Critical Process Parameters on scale up to commercial manufacturing
 - Journal enables built in knowledge transfer of key performance indicators alongside analysis



Batch Monitoring and Reporting



CHALLENGE

- Batch monitoring and reporting involves compiling data and results from a variety of data sources incl PI System, AF, MES, LIMS in a single place
- Calculations require robust analytics and visualization tools
- cGMP Compliance is critical



SOLUTION

- Aggregate batch data (process, quality, maintenance, PAT, genealogy) from multiple data sources
- Build trends, statistical limits, and KPIs in Workbench
- Create custom visualizations in Data Lab
- Compile all information into a dashboard or report



RESULTS

- Live-updating dashboard or static batch report
 - Integrated Security limits access where applicable
 - Audit Trail tracks changes to any cGMP calculation
- Drill-down capability to raw data or calculations
- Ability for batch to batch comparisons or scale report template to other batches

Key Take Aways and Summary

Seeq the natural extension of the PI system



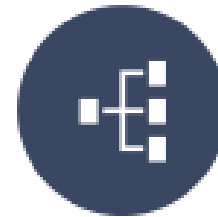
Key Takeaways



Flexible & Complementary Capabilities



Self-serve Enablement of the SMEs is Foundational for Trusted, Actionable Performance Intelligence



PI AF should be the Primary Integration Point with PI Core



Understand the capabilities of both the PI System and Seeq
Use the Right Tool for the Right Task





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DZIĘKUJĘ CI
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 GO RAIBH MAITH AGAT
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 ТИ БЛАГОДАРАМ
 TAK DANKE
 RAHMAT
 HATUR NUHUN
 PAKKA PÉR
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ABOUT AVEVA

AVEVA is a global leader in industrial software, driving digital transformation and sustainability. By connecting the power of information and artificial intelligence with human insight, AVEVA enables teams to use their data to unlock new value. We call this Performance Intelligence. AVEVA's comprehensive portfolio enables more than 20,000 industrial enterprises to engineer smarter, operate better and drive sustainable efficiency. AVEVA supports customers through a trusted ecosystem that includes 5,500 partners and 5,700 certified developers around the world. The company is headquartered in Cambridge, UK, with over 6,500 employees and 90 offices in over 40 countries.

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