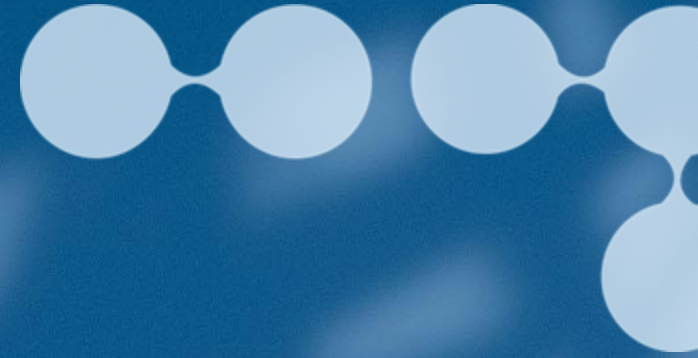




Optimizing Pharmaceutical Manufacturing with AI-Enabled Analytics

connect
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Yanhua Qiu, PhD

Associate Director in Manufacturing Science & Technology (MS&T) at Teva Pharmaceuticals

- ❖ Provides technical and strategic leadership for commercial manufacturing operations, overseeing a 10+ MS&T team members and ensuring consistent execution in regulated environments
- ❖ Leverages 10+ years of experience in drug product development and manufacturing to guide lifecycle strategy and execution
- ❖ Leads high-complexity initiatives across new product launch, technology transfer, process validation, and continuous improvement
- ❖ Champions manufacturing modernization and digital transformation, enabling data-driven insights and scalable, compliant solutions
- ❖ Drives cross-functional alignment to strengthen organizational capability, operational excellence, and long-term manufacturing performance



Maichong Xie, PhD

Specialist in Manufacturing Science & Technology (MS&T) at Teva Pharmaceuticals.

- ❖ Expertise in pharmaceutical manufacturing science and digitalization.
- ❖ Strong background in data analytics and project management (PMP).
- ❖ Focuses on driving process optimization, reliable tech transfer, and data-driven decision making in regulated manufacturing environments.



Disclaimer

The views and opinions expressed in this presentation are those of the speaker in their individual capacity and do not necessarily reflect the views, positions, or policies of Teva Pharmaceuticals or its affiliates

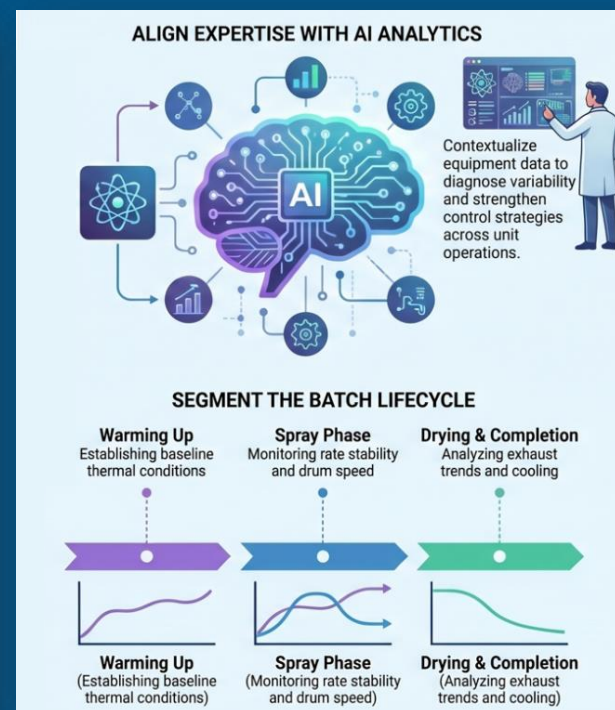
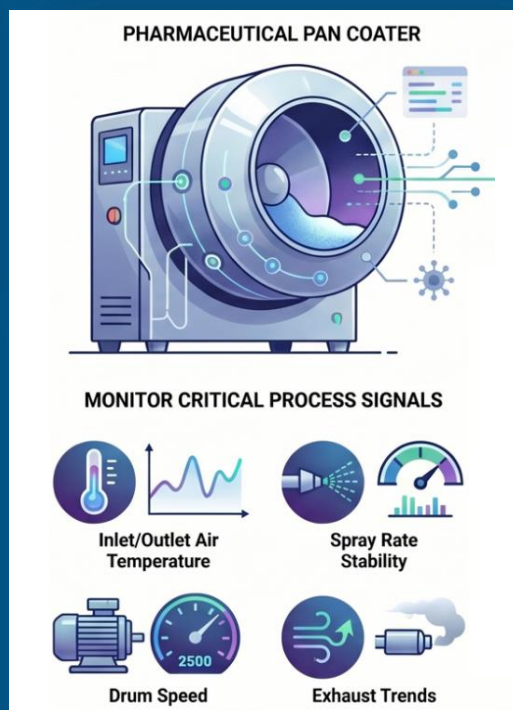
Abstract

Real-world insights from pharma presenters highlighting how **equipment-centric analytics** improve coating uniformity, reduce deviation cycle time, and scale best practice dashboards across sites

- Conneqt 2026 Focus - Combining human expertise with AI-Enabled Industrial Analytics

OSD MS&T teams rely heavily on equipment-level data to diagnose variability and strengthen control strategies across unit operations.

How Seeq helps engineers rapidly contextualize pan coater signals—such as inlet/outlet air temperature, spray rate stability, drum speed, and exhaust trends—to accelerate troubleshooting and batch performance optimization.



Operational breakthroughs occur when people and AI advance together

Human + AI Foundation in Teva Today



Problem Statement

Massive equipment data is difficult to turn into actionable insights



PI Historian

- Equipment Connection
- Data Visibility



Power BI

- Multi-source Data Ingestion
- Real-time Data Visibility



Electronic Batch Record

- Paperless Operation/Clean
- Review by Exception



Seeq

- Equipment Data Ingestion
- Real-time Data Visibility
- Modelling & Analysis

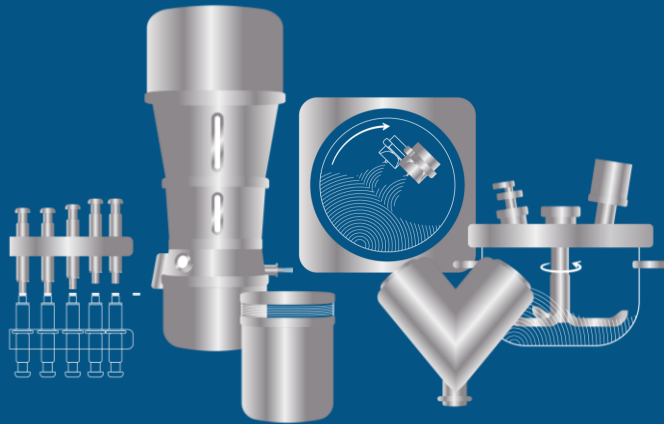


Future

Accelerating equipment performance by **empowering people** with **human-guided AI**

Why “Human Expertise + AI” Are Needed to Unlock Equipment Data

Complex processing equipment



- Complex dynamics
- Narrow windows

Massive volumes of process signals

 ₁ 64.5 °C	 ₂ 34.2 °C	...
 ₁ 34 rpm	 ₂ 43 rpm	...
 ₁ 15.3 psi	 ₂ 28.6 psi	...
 ₁ 430 cfm	 ₂ 108 cfm	...

- Process physics insights
- Failure modes knowledges



Enabling proactive process optimization



- Rapid Patterns Recognition
- Fast Anomalies identification

The Cost of Missing Context

Investigations take weeks



Root causes are buried in **disconnected** fragments, creating the illusion that they're unknowable.

Trial-and-error takes over



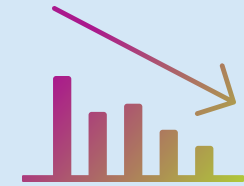
Decisions often rely on **anecdotal experience & tweaks**, driving more variability, not less.

Knowledge stays siloed



“How we fixed it last time” **lives in a few experts' head**, creating delay and dependency

Hidden costs & risks compound



Deviation cycles **stretch**, releases **delay**, **compliance risk rises**, and hidden costs

The shift is **not more data**, but **better structure**:
Organizing existing data so teams can quickly see what changed and why it matters.

How Human Intelligence Is Scaled with Seeq AI Assistant

Seeq AI Assist does not replace Seeq analytics; it lowers the activation energy to use them

Dimension	 + Seeq®	 + Seeq® +  AI Assistant
Phase definition	Manual setup, prior knowledge of UI	Natural language prompt
Overlay creation	Multiple manual configuration steps	Natural language prompt
Data Exploration	Trial-and-error analysis	Conversational iteration
User accessibility	Seeq power users and experts	Any engineer

Pan Coater in Teva: A Perfect Start with AI



➤ High Impact Procedure



➤ Tightly Coupled Variables

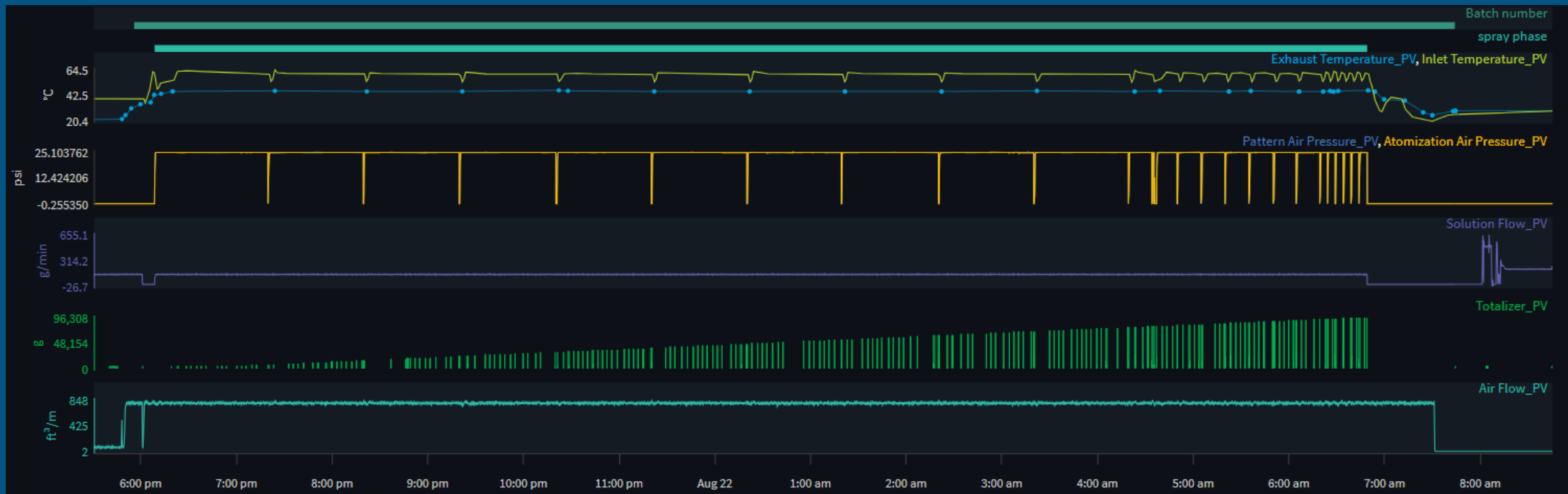


➤ Small Deviation Cascade



Basic: Seeq Enable Analytics-driven view

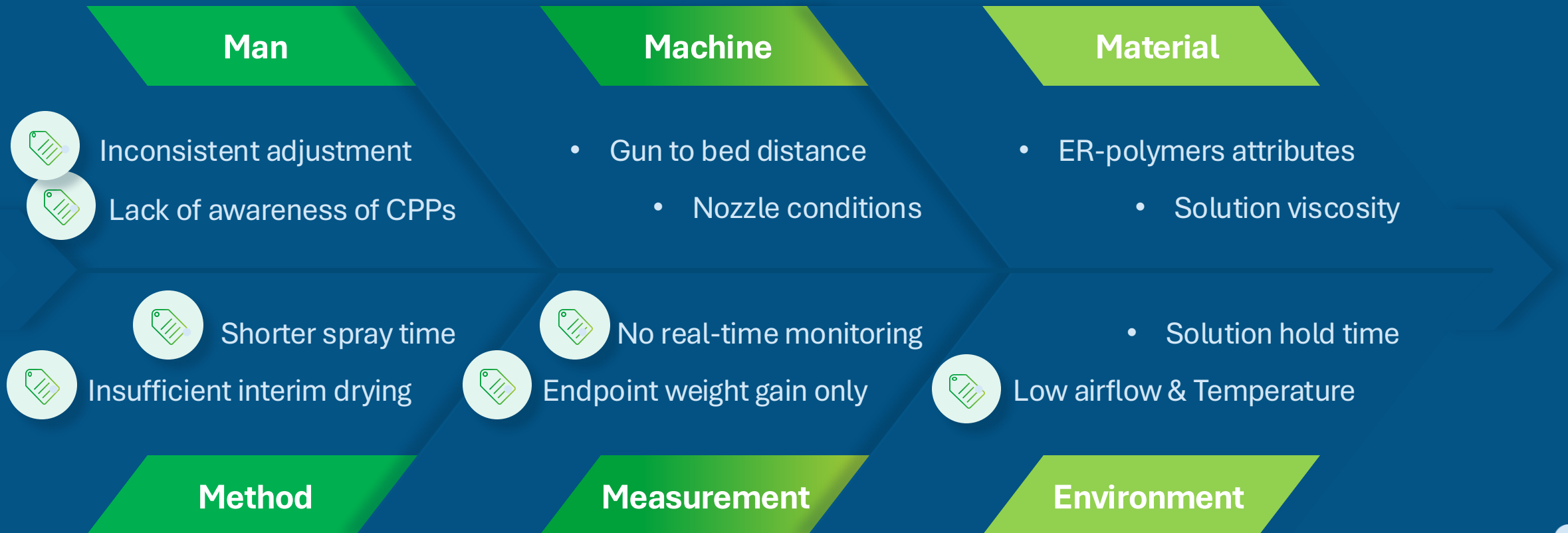
Equipment-centric Method



“ Find batch xxx, overlay all PV data for me.”

Advanced: Seeq Speed up the Investigation

Dissolution Out of Specification (Slow) – ER Coating Stage



Advanced: Seeq Speed up the Investigation



“Find batch xxx and batch xxx, pull all PV data and compare them side by side”

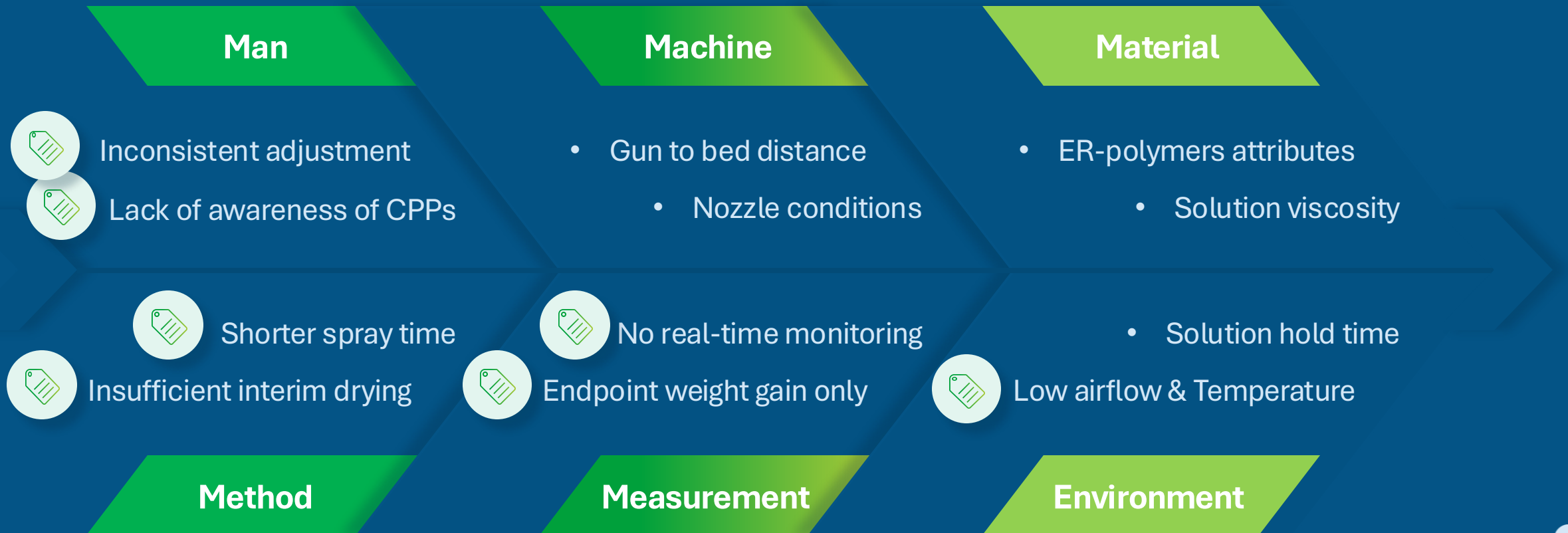
Advanced: Seeq Speed up the Investigation



“Please overlay all the data”

Advanced: Seeq Speed up the Investigation

Dissolution Out of Specification (Slow) – ER Coating Stage



Advanced: Seeq Speed up the Investigation

Dissolution Out of Specification (Slow): Extended-Release Coating Stage

Machine

- Gun to bed distance
- Nozzle conditions

20 days > 2 hours

Save up to

98 %

on Troubleshooting Time

Human Intelligence, Scaled by AI



**Human Expertise
as the Foundation**



**Together, We
Maintain Governance**



**AI as an Accelerator
and Enhancer**

Q&A

