
Seeq
conneqt
PROCESS MONITORING & CONTROL
#allin

Scaling Lean Six Sigma Tools Across An Enterprise

Krissy Key

Transformation Data Engineer

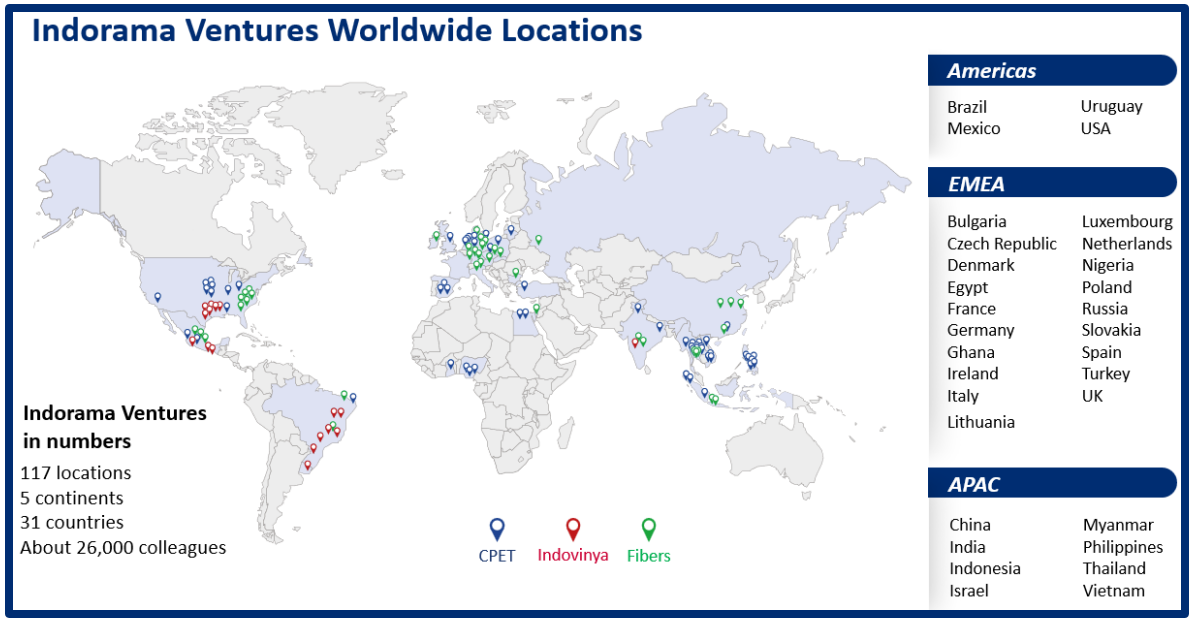
Indorama

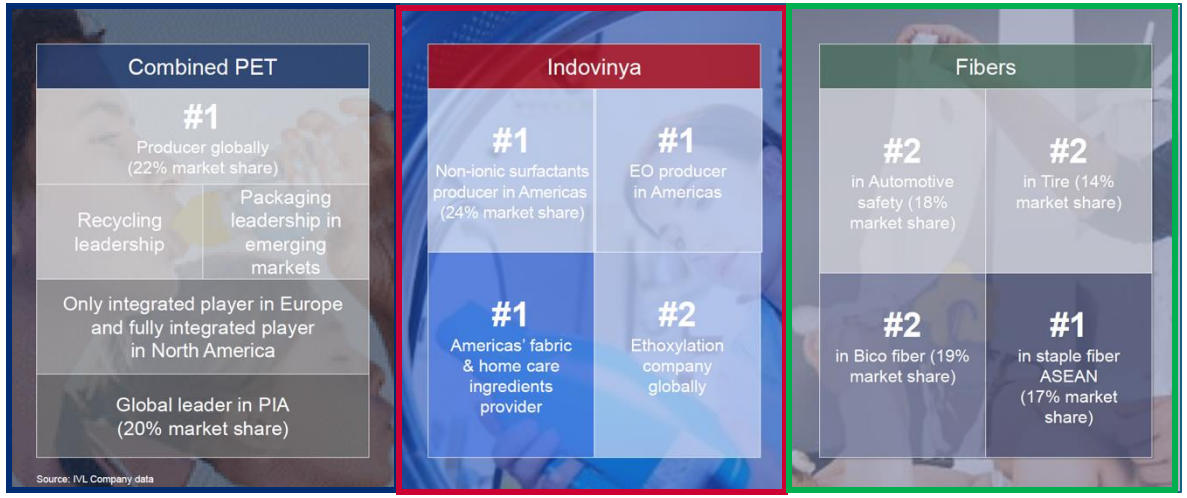
Introduction

Krissy Key | Transformation Data Engineer

Seasoned Engineering professional with nearly 20 years of experience excelling in engineering, problem-solving, Lean Six Sigma, communication, and organization. Proven track record in transforming ideas into reality, resolving complex challenges, and driving efficiency through structured processes. Adept at fostering transparent communication, building strong relationships, and ensuring optimal project execution. Joined Indorama Ventures in 2017 as R&D Program Manager followed by Transformation Data Engineer in 2024.

a.k.a...Problem Solver





Overview

In layman's terms, "Is the plant making good product?"

In Lean Six Sigma terms, we ask the following:

Overview

In layman's terms, "Is the plant making good product?"

In Lean Six Sigma terms, we ask the following:

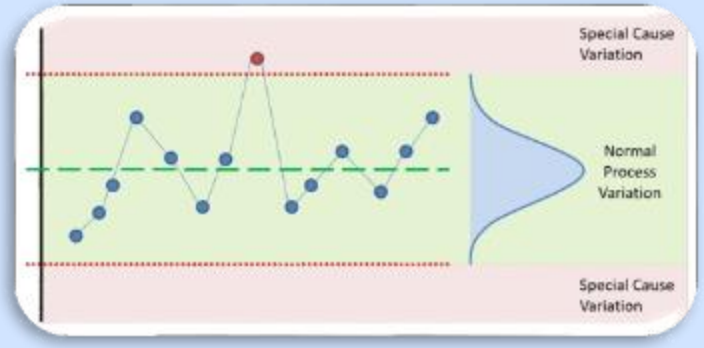
What is the Process Capability

Calculate the **Cpk**

Overview

In layman's terms, "Is the plant making good product?"

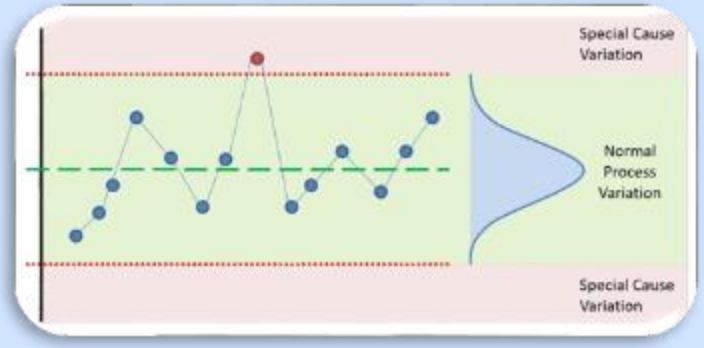
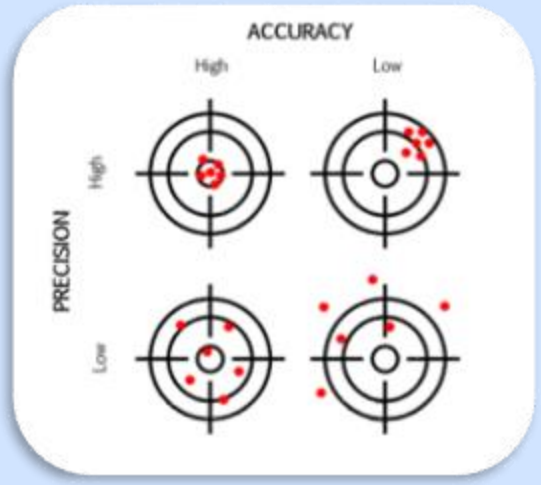
In Lean Six Sigma terms, we ask the following:

What is the Process Capability	Is the Process in Control
	
Calculate the **Cpk**	Create an **SPC Chart**

Overview

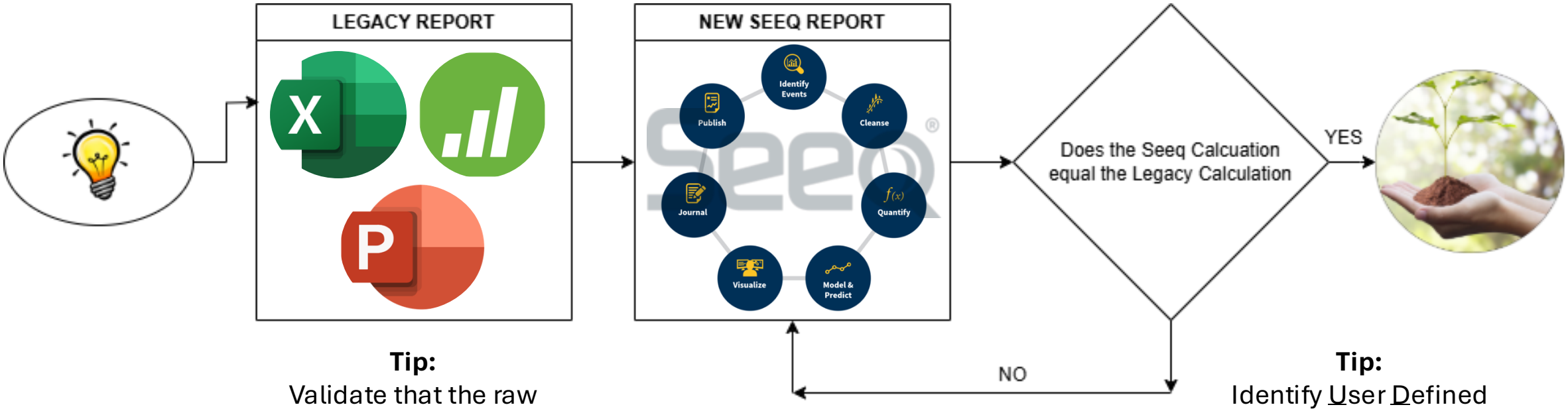
In layman's terms, "Is the plant making good product?"

In Lean Six Sigma terms, we ask the following:

What is the Process Capability	Is the Process in Control	Can the Process be Measured
		
Calculate the **Cpk**	Create an **SPC Chart**	Calculate the **Gage R&R**

Developing Lean Six Sigma Reports in Seeq

From Single Idea to Growth Mindset



Tip:
Validate that the raw data is setup correctly prior to starting conditions and calculations

Tip:
Identify User Defined Functions to simply growth and replication

What is the Process Capability

Calculate the Cpk

Lean Six Sigma Formula

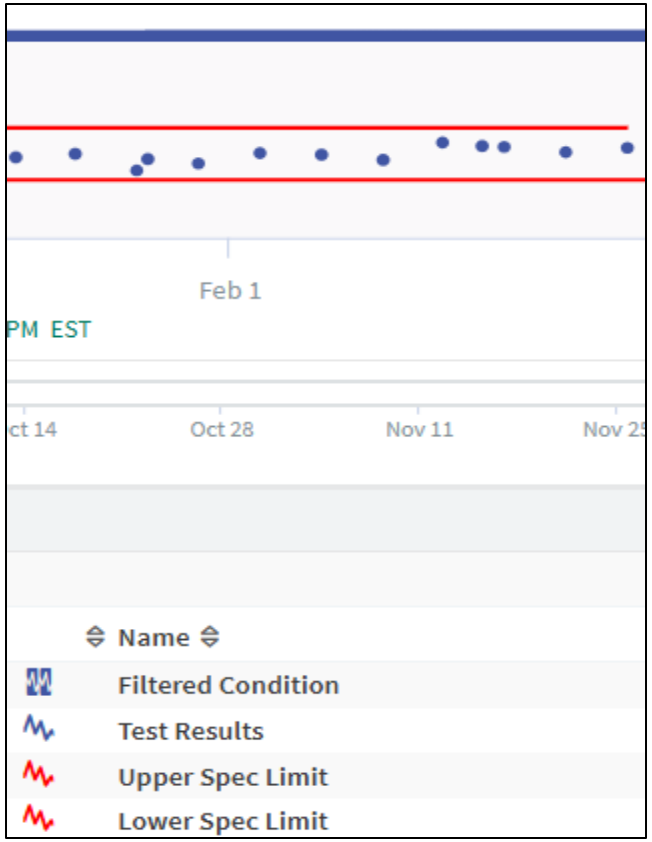
$$Cp = \frac{(USL - LSL)}{6\hat{\sigma}}$$

$$CpU = \frac{(USL - \bar{X})}{3\hat{\sigma}}$$

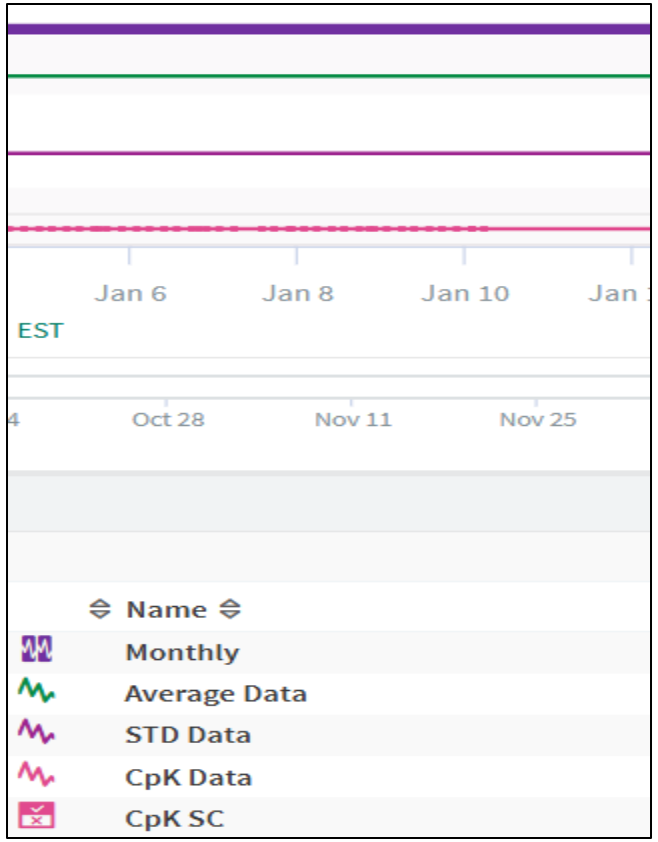
$$CpL = \frac{(\bar{X} - LSL)}{3\hat{\sigma}}$$

$$Cpk = Min(CpU, CpL)$$

Seeq Data



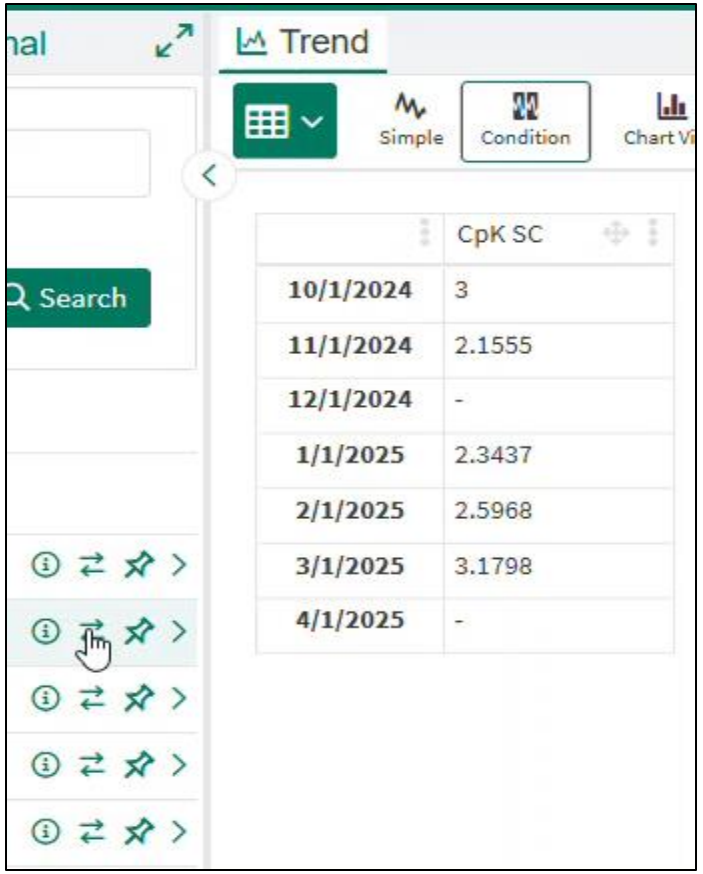
Seeq Formula



What is the Process Capability

Calculate the Cpk | Create an Asset Tree for All Products & All Attributes

Asset Swapping



Attribute Table

	CpK SC	CpK SC	CpK SC	CpK SC
	Attribute 1	**Attribute 2**	**Attribute 3**	**Attribute 4**
10/1/2024	3	2.5285	0.4134	0.0732
11/1/2024	2.1555	0.5684	0.7974	0.4425
12/1/2024	-	-	-	-
1/1/2025	2.3437	0.9013	0.7116	0.6946
2/1/2025	2.5968	0.6193	2.5055	0.3598
3/1/2025	3.1798	1.2283	1.372	0.3962
4/1/2025	-	-	-	-2.97

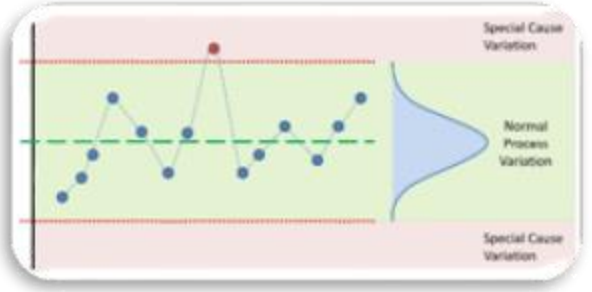
Completed Cpk value for one product, one line & one attribute in SEEQ. Approximately 10 steps or 10 minutes.

Want to scale to **all products** and their attributes at Auriga. Example: **150 products,** minimum 3-4 attributes each

>50,000 Minutes SAVED!

Is the Process in Control

Create an SPC Chart (Statistical Process Control)

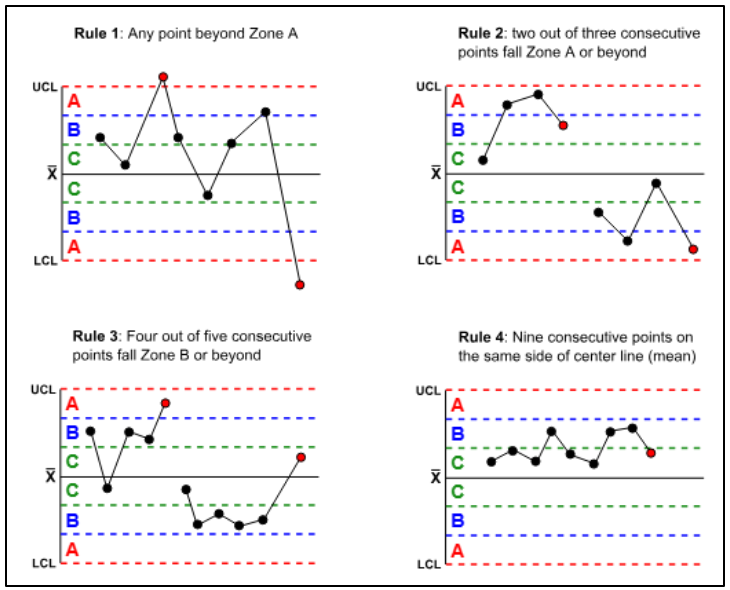


Lean Six Sigma Formula

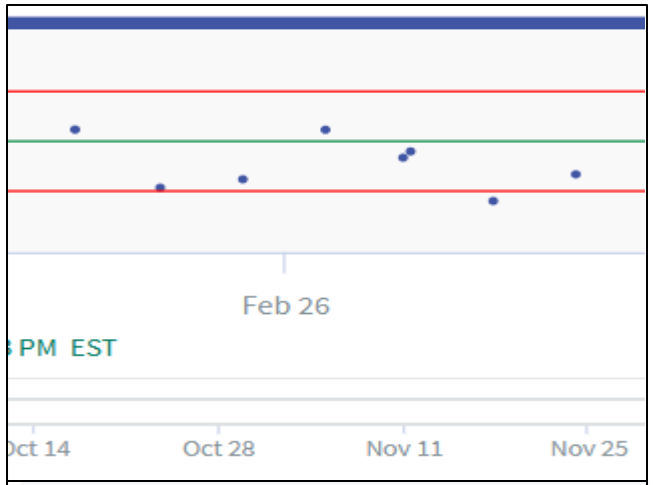
UCL = target + 3*standard deviation

LCL = target – 3*standard deviation

Western Electric Rules



Seeq Data



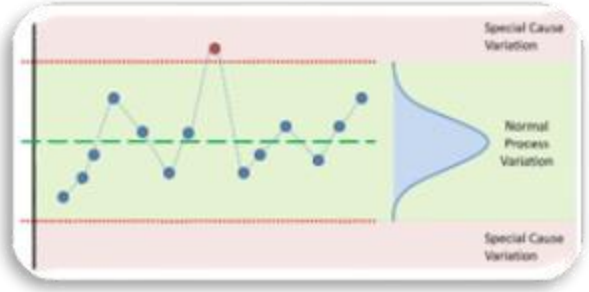
	Name
	ProductCondition
	Test
	Test Max
	Test Min
	Target

Seeq Formula

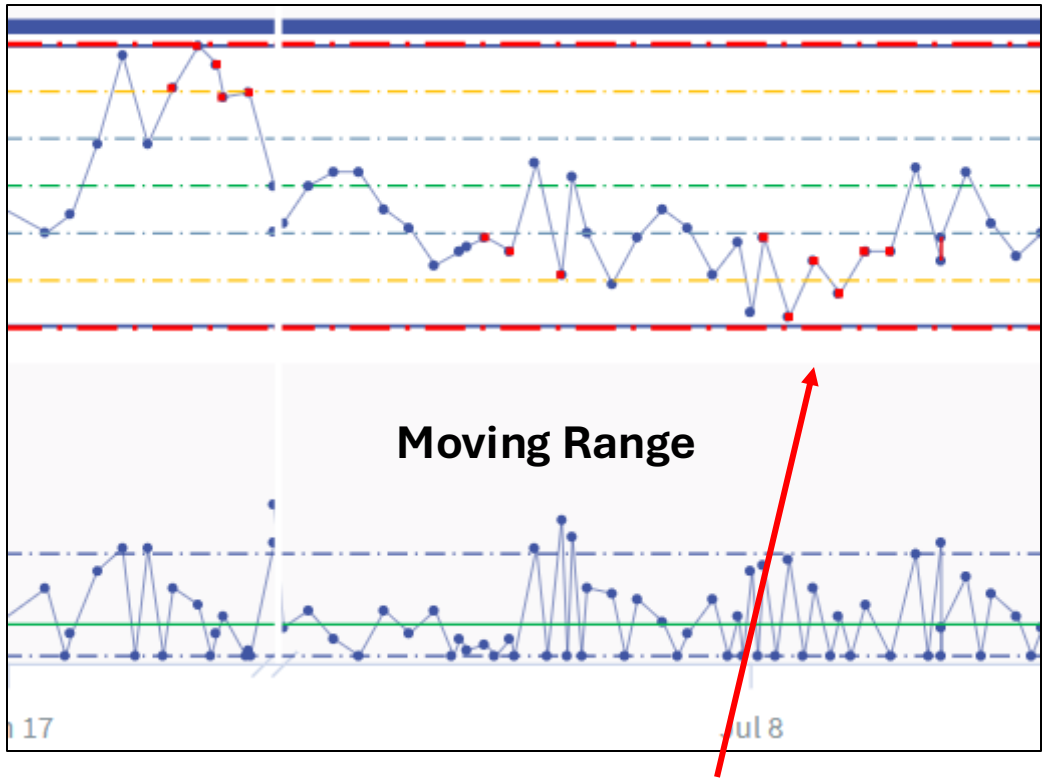
Name
STD Data
minus1sd
minus2sd
minus3sd
plus1sd
plus2sd
plus3sd
Western Electric 1
Western Electric 2
Western Electric 3
Western Electric 4
Moving Range
Moving Range Average
Moving Range UCL

Is the Process in Control

Create an SPC Chart | Create an Asset Tree for All Products & All Attributes



Individual Moving Range (I-MR) with 4 Western Electric Rules

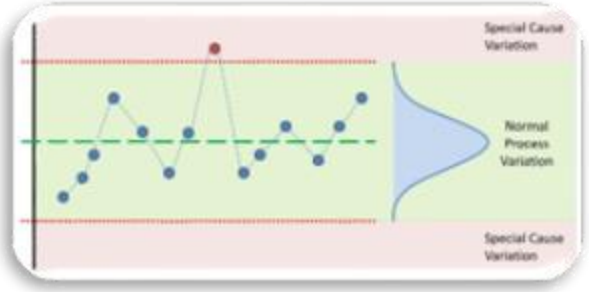


Out of Control Points marked in **Red** to take action!

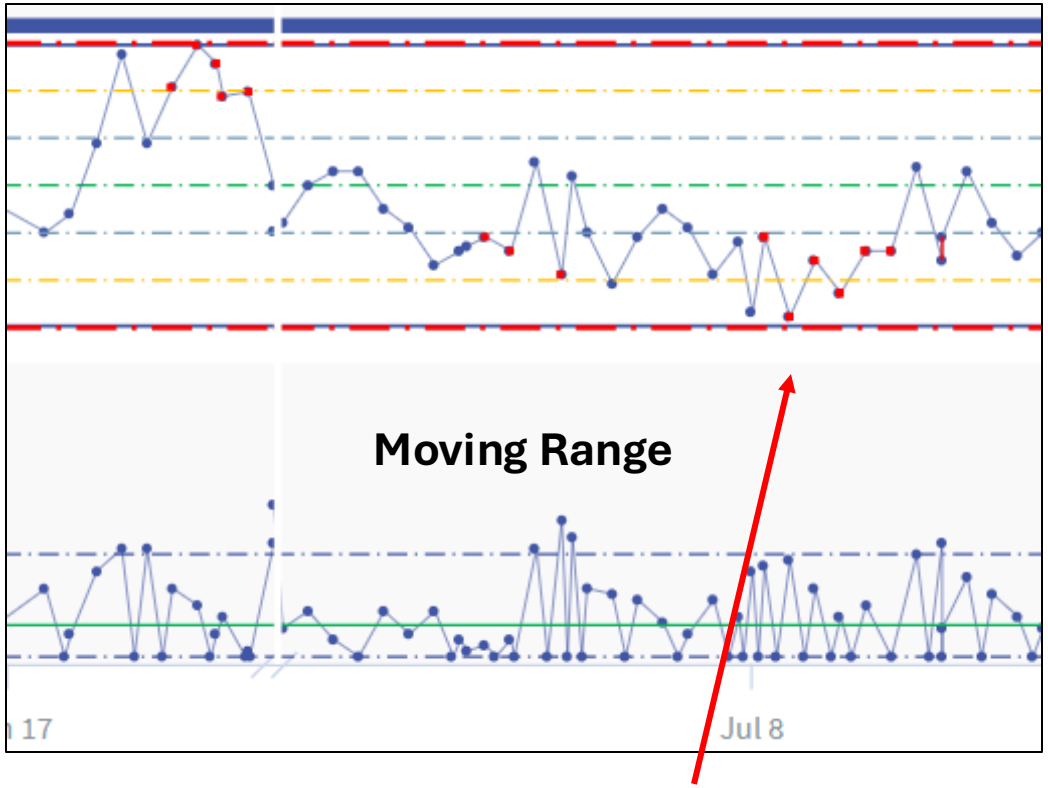
Swappable Asset Tree? YES!

Is the Process in Control

Create an SPC Chart | Create an Asset Tree for All Products & All Attributes

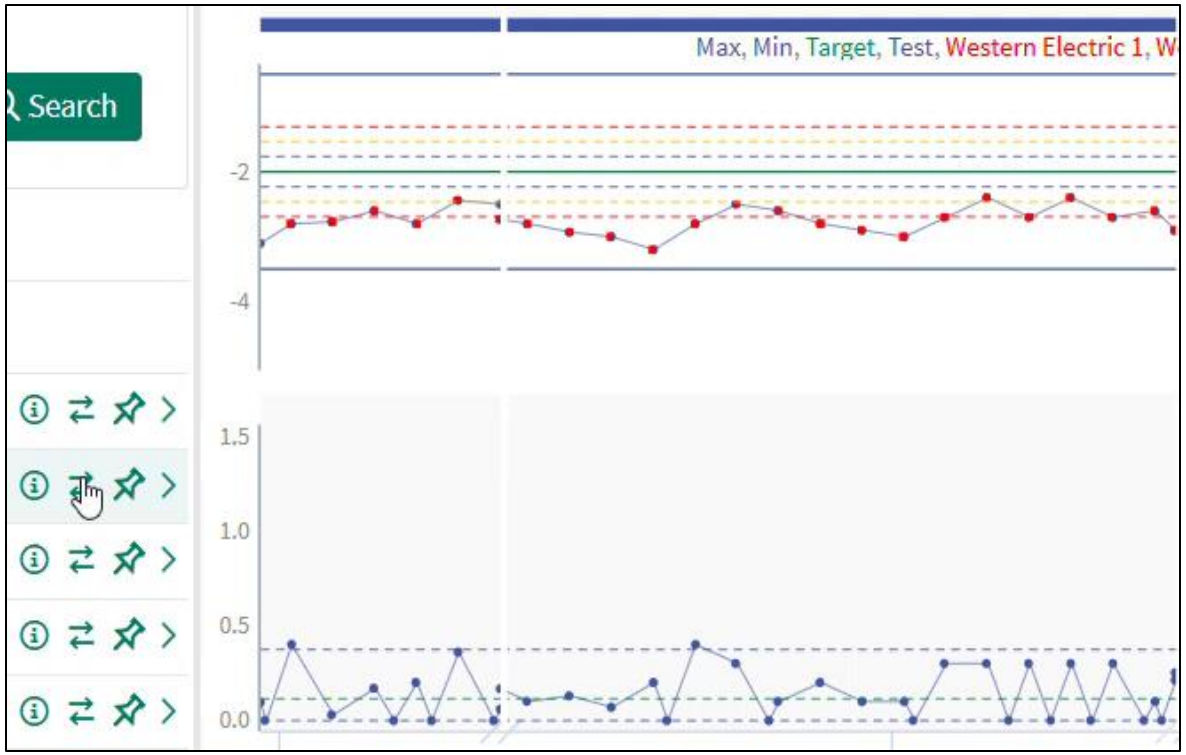


Individual Moving Range (I-MR) with 4 Western Electric Rules



Out of Control Points marked in **Red** to take action!

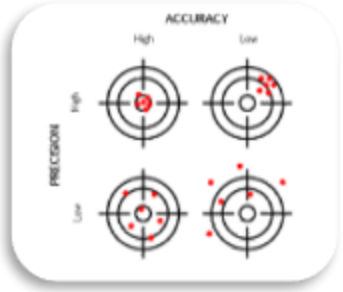
Swappable Asset Tree? YES!

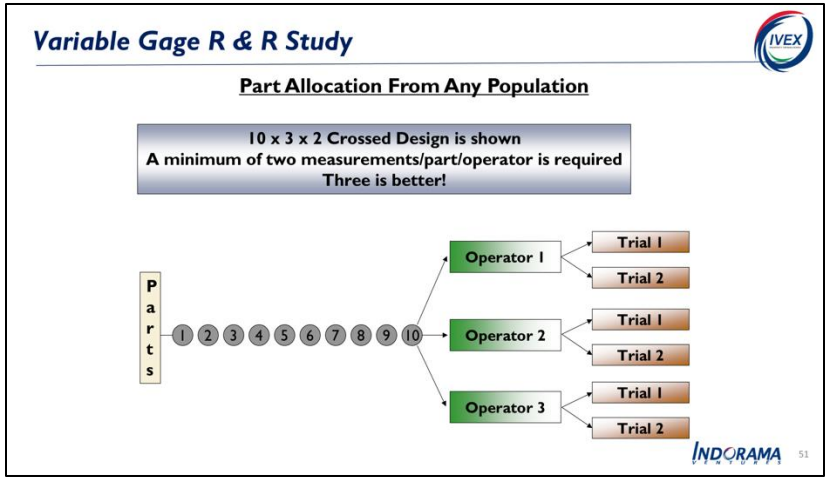


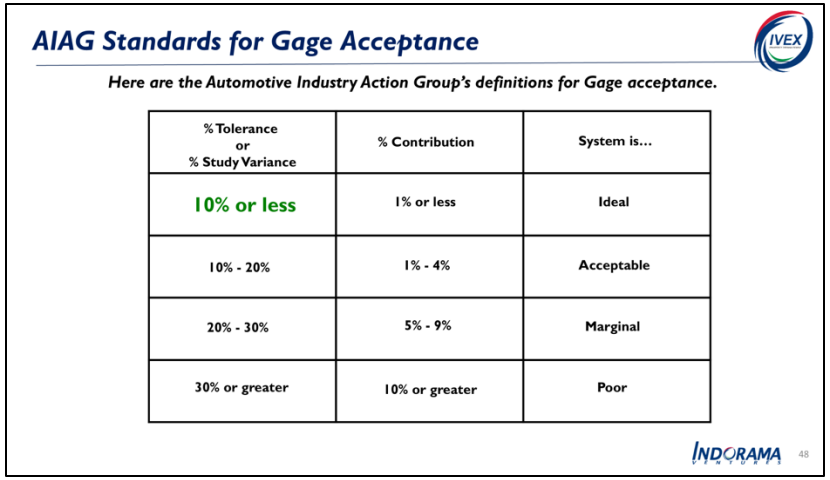
Creating **One** and **Done** Solutions

Can the Process be Measured

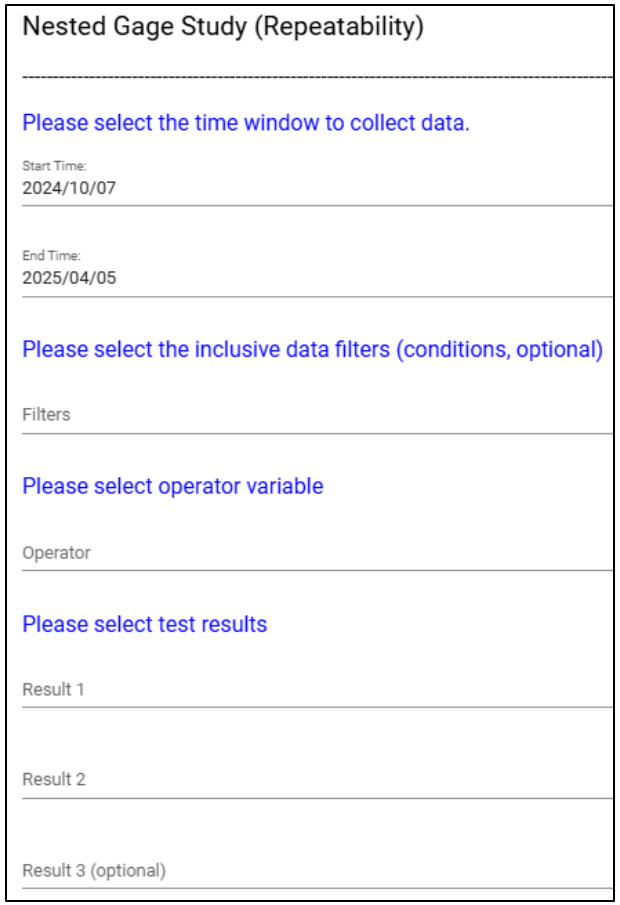
Calculate Gage R&R | Create an Add-on tool







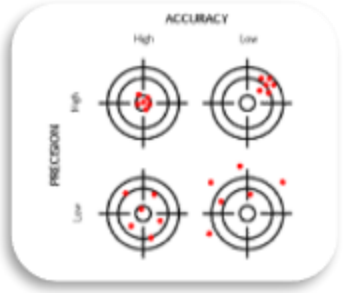
Nested Gage Add-on Inputs



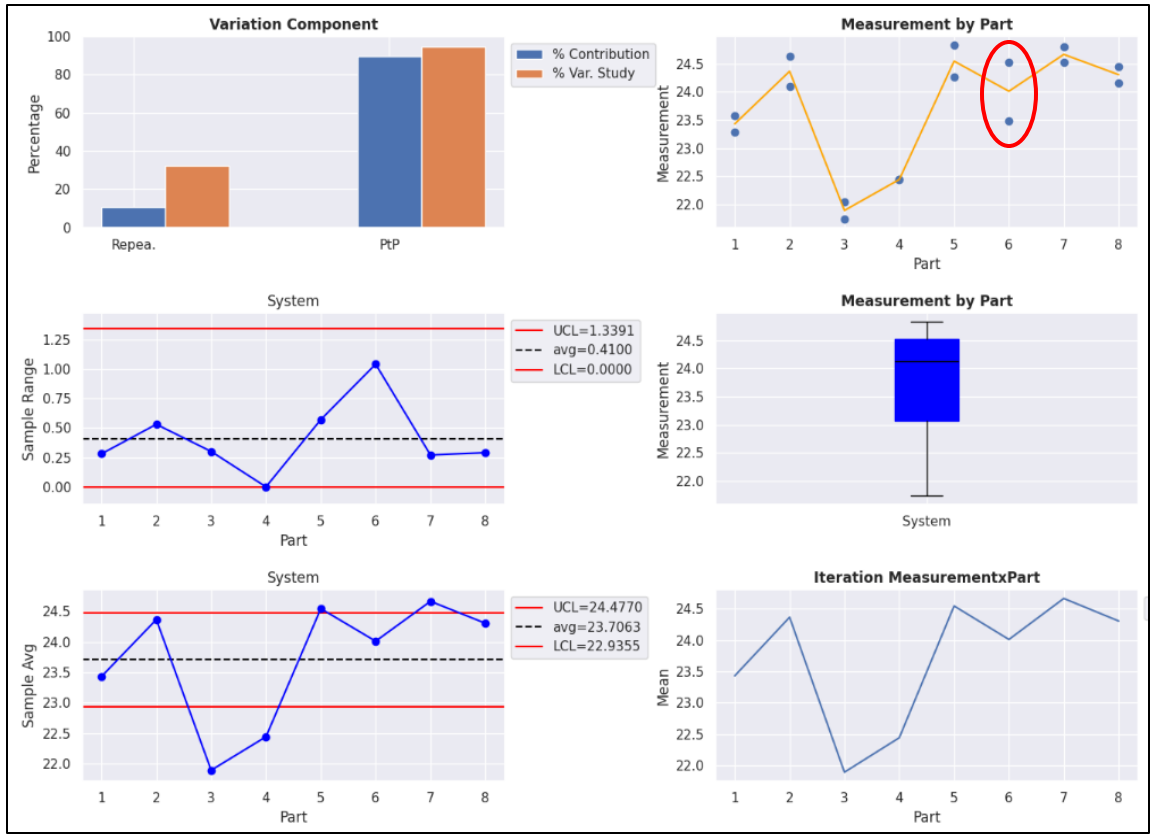
- Traditional Gage R&R studies require planned experiments, time and operators to execute then analyze.
- Use the Gage R&R Add-On to analyze real time data from everyday operations.

Can the Process be Measured

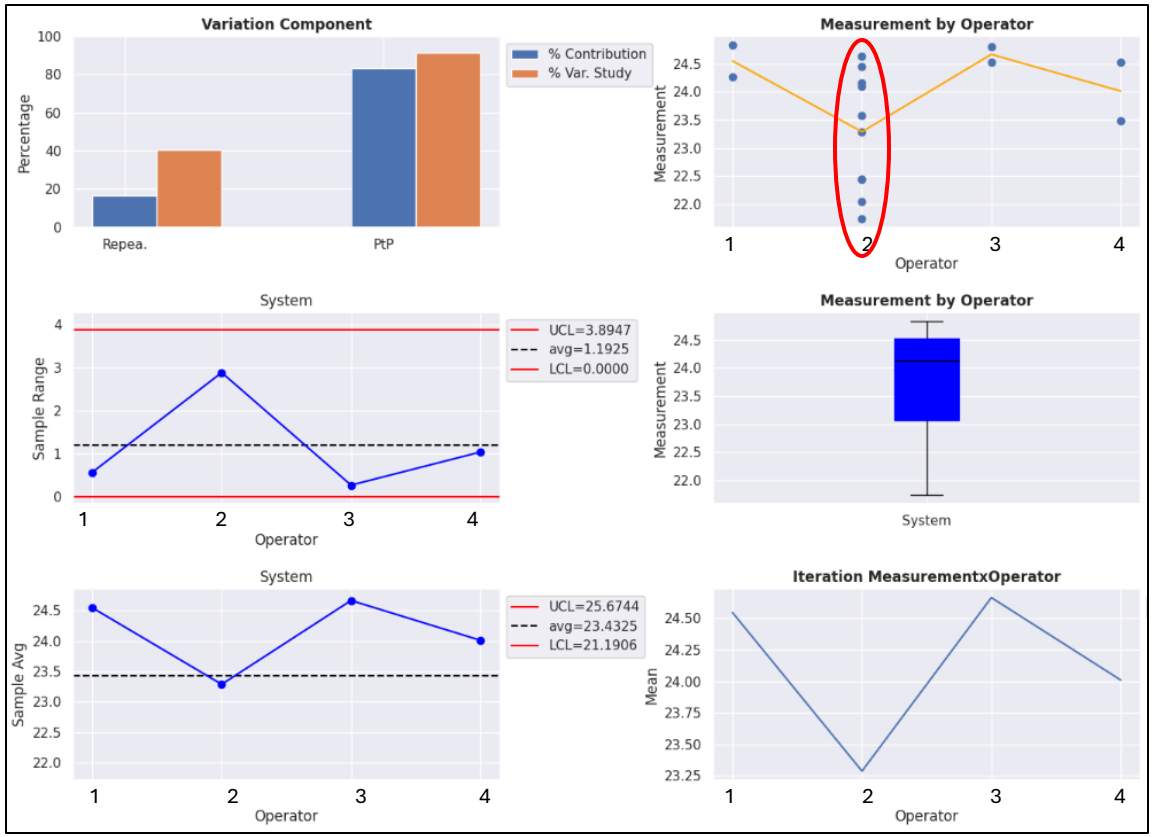
Calculate Gage R&R | Create an Add-on tool



Measurement by Part



Measurement by Operator



Ready, Set, *GROW!*

Data Scientist & Lean Six Sigma Community

Driving Value with Advanced Solutions Through Deployed Asset Trees & Add-on's

AIA Program Lead

Global Digital Applications & Advanced Analytics Leader

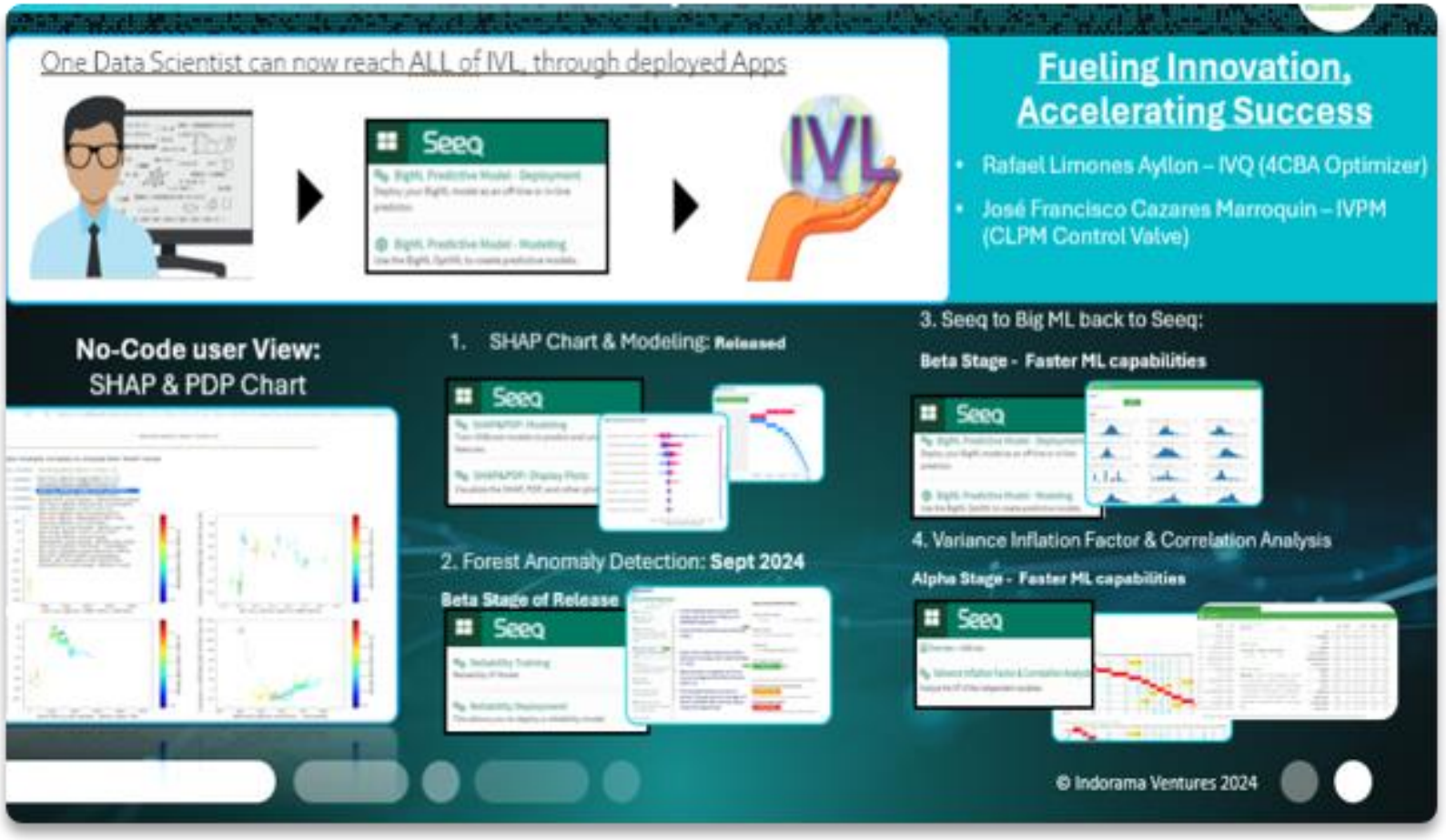
IVL Leadership Team

IVL Group Head of IVEX

Digital Team

Data Science Engineer

Senior Data Scientist

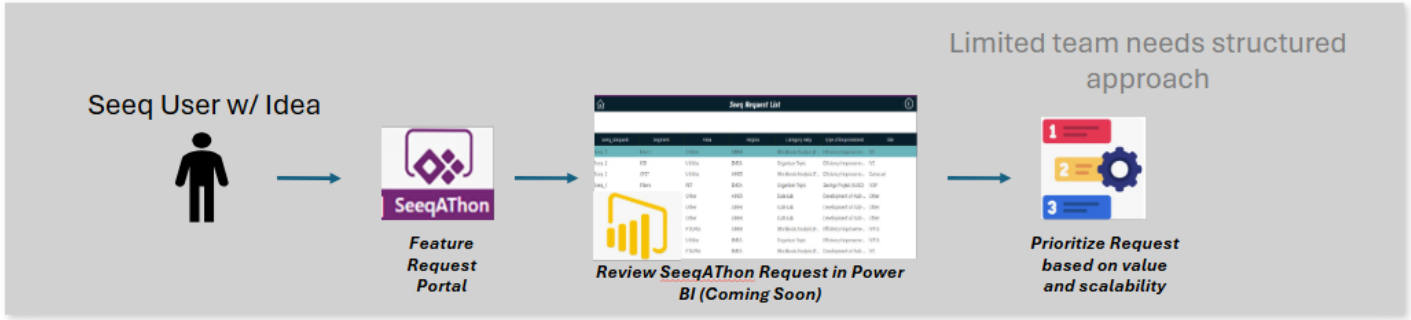


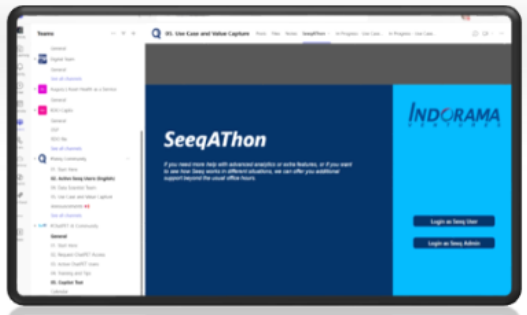
Continuing our Growth

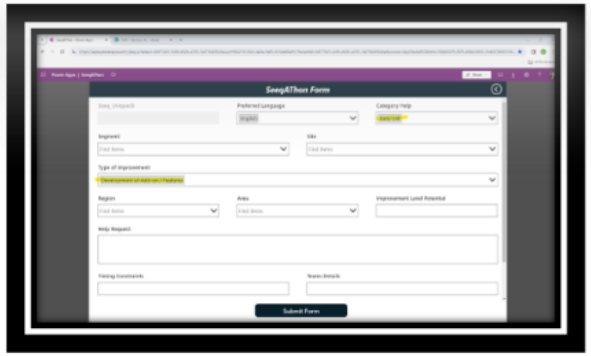
Need Something More that You Don't See? Feature Request Portal

Additional Feature Request - SeeqAThon

Handle multiple requests by organized approach







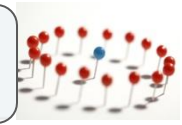
Indispensable Chemistry

New IVEX Tools Being Released

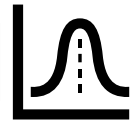
May 2025

SPC Accelerator (Seeq add-on)
Create Statistical Process Control (SPC) control charts and apply run rules

Variance Inflation Factor
Analyze the VIF of the independent variables

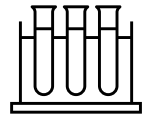


Process Capability for Asset Trees
Calculates and graphs process capability for structured asset trees set up in workbench



One-way ANOVA
One-way ANOVA, Normality test, and more

Nested Gage Study
Measurement repeatability study



See Sherri Goodwin's presentation "Optimizing Data Science Deployment for Velocity of Value @ Scale" for more insights on how we apply lean manufacturing to our Data Scientist Community

Before You Leave Today, Remember…

Lean Six Sigma Ninjas Solve Once & Share Tools Across the Enterprise
Delivering Velocity 2 Value @ Scale Through Talents & Passion

Before You Leave Today, Remember…

Lean Six Sigma Ninjas Solve Once & Share Tools Across the Enterprise
Delivering Velocity 2 Value @ Scale Through Talents & Passion

Seeq Analytics

- Clean, analyze and visualize live production data in Workbench
- Use low or no code formulas to develop analytics one time
- Set action notifications

Before You Leave Today, Remember…

Lean Six Sigma Ninjas Solve Once & Share Tools Across the Enterprise
Delivering Velocity 2 Value @ Scale Through Talents & Passion

Seeq Analytics

- Clean, analyze and visualize live production data in Workbench
- Use low or no code formulas to develop analytics one time
- Set action notifications

Explosive Mindset

"I'm GREEDY! Can I have this analysis for all products at my plant? YES!"

- Develop Asset Trees in Data Lab
- Share Python code plant to plant
- Scale from One to Many ***FAST***

Before You Leave Today, Remember…

Lean Six Sigma Ninjas Solve Once & Share Tools Across the Enterprise
Delivering Velocity 2 Value @ Scale Through Talents & Passion

Seeq Analytics

- Clean, analyze and visualize live production data in Workbench
- Use low or no code formulas to develop analytics one time
- Set action notifications

Explosive Mindset

"I'm GREEDY! Can I have this analysis for all products at my plant? YES!"

- Develop Asset Trees in Data Lab
- Share Python code plant to plant
- Scale from One to Many ***FAST***

Time Savings

- Format reports in Organizer and set to automatically update
- Share across your organization
- Focus on problem solving and continuous improvement

Thank You
&
Let’s Conneqt


Seeq
conneqt
#allin