



# Training the Whole Organization toward Digital Transformation, at Scale

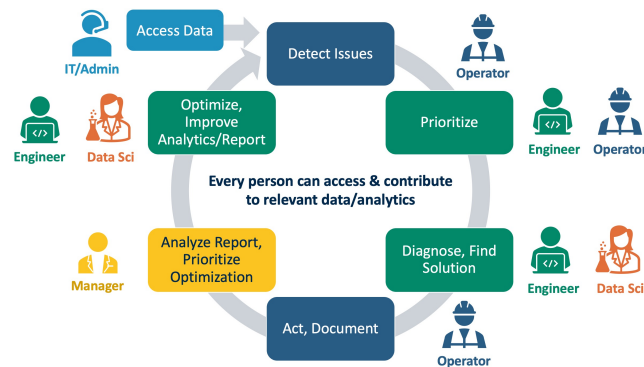
**Building Skills & Expanding Vision for Analytics**

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Principal Analytics Scientist / Training Program Leader

# Training the Whole Organization toward Digital Transformation, at Scale

## Learn Analytics In Context of Decision Support (Instead of “How To Use Software”)



## Develop the Right Skills for Each Persona

### CURRICULUM FOR EACH ROLE

IT/Admin	Operators	Engineers	Data Sci	Management
<ul style="list-style-type: none"> <li>Connect Data</li> <li>Security</li> <li>Install &amp; Update Server</li> <li>Routine Admin Tasks                             <ul style="list-style-type: none"> <li>User support</li> <li>Data management</li> <li>Content management</li> </ul> </li> <li>Performance Optimization &amp; Troubleshooting</li> <li>Common SUP Issues</li> </ul>	<ul style="list-style-type: none"> <li>View Dashboards</li> <li>Detect Issues                             <ul style="list-style-type: none"> <li>Understand Rollup Visualizations</li> </ul> </li> <li>View underlying data</li> <li>Basic diagnostics – e.g., related tags</li> <li>Document actions</li> <li>Identify/contact relevant engineers</li> </ul>	<ul style="list-style-type: none"> <li>Foundations Analytics Skills                             <ul style="list-style-type: none"> <li>Identify events, Cleanse, Quantify, Model &amp; Predict, Visualize</li> </ul> </li> <li>Document work/capture knowledge</li> <li>Build useful dashboards, reports</li> <li>Continuous Improvement – improve process &amp; analytics                             <ul style="list-style-type: none"> <li>Data management</li> <li>Deploy analytics at scale</li> <li>Adv. Anomaly Detection</li> <li>Efficiency &amp; Performance</li> <li>Deploy scripts for use by engineers, etc.</li> </ul> </li> </ul>		<ul style="list-style-type: none"> <li>Understand Rollup Visualizations, &amp; Drill Down</li> <li>Prioritize</li> <li>Identify relevant teammates for tasks</li> </ul>

## Engage Individual Learners



**Real, Relevant, & Applied**



**Socratic** (Exercises ask “leading questions”)



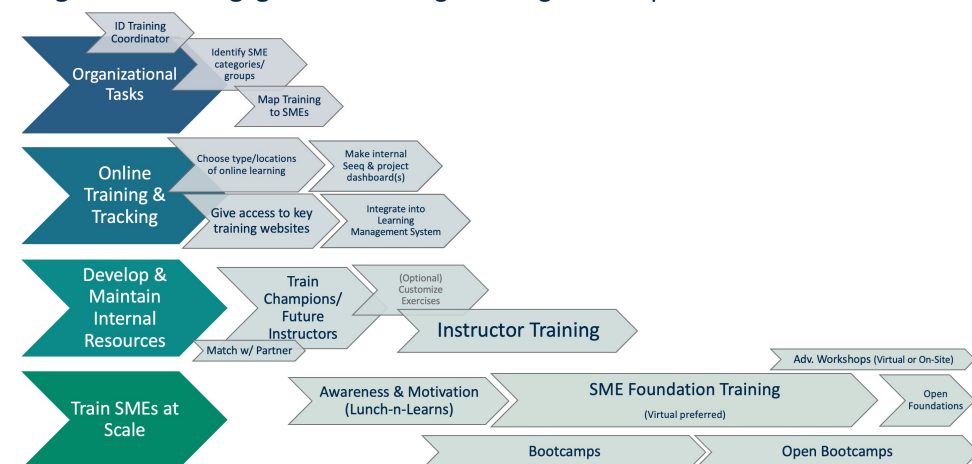
**Timed Repetition** 2-4x ~30 min, 2x 24 hr, 1 week



Create a **Friendly, Collaborative Atmosphere**

## Fully Support & Plan Learning Rollout

### Organizational Engagement: Training Planning Roadmap



# Overview

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- **The Goal**

Agile, Organic Decision Support & Continuous Improvement

- **The Conceptual Gap**

Learn *Analytics* In Context (Instead of “How To Use Software”)

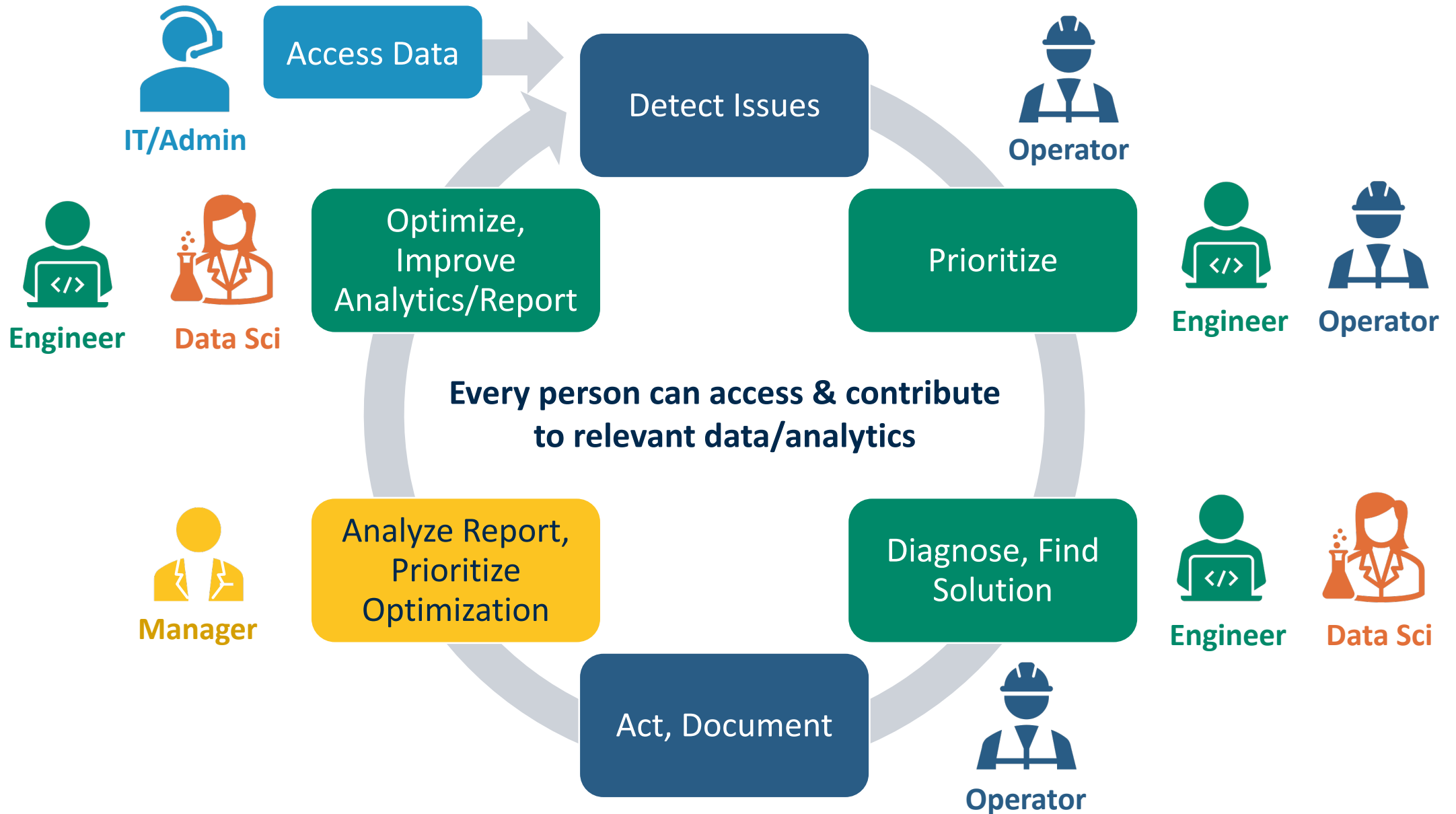
- **The Curriculum**

Training Each Persona Toward Agile Decision Support & Improvement

- **Engagement: Individual & Organizational**

Getting Learners To Absorb, Retain, & Use New Skills

# Goal: Agile, Organic Decision Support & Continuous Improvement



# The Conceptual Gap: Learn *Analytics* In Context (Instead of “How To Use Software”)

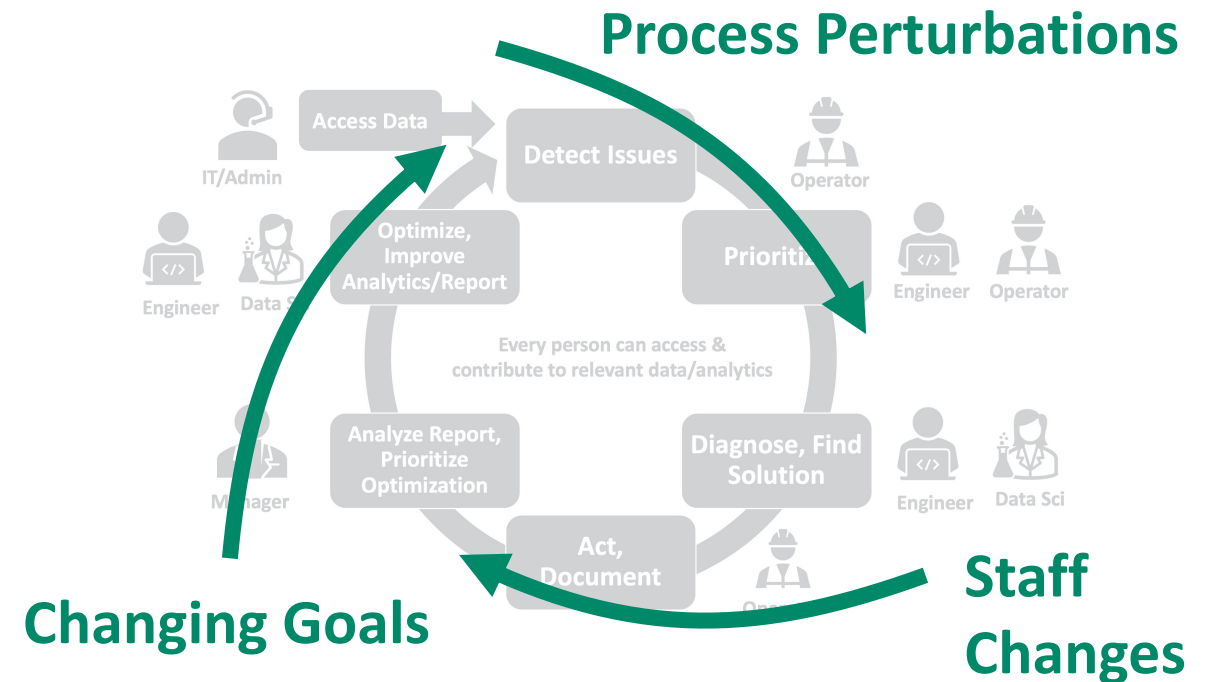
## Without context

- Skills without vision to apply
  - Reinventing the wheel
- Little knowledge transfer b/w roles
- Hard to operationalize new approaches (Data Sci)



## With context

- Everyone finds and uses insights
- Informed decision-making
- Adjust to system perturbations



# Curriculum: Training Each Persona Toward Digital Transformation



IT/Admin



Operators



Engineers



Data Sci



Management

- |  |  |  |   |
|--|--|--|---|
| <ul style="list-style-type: none"> <li>• Connect Data</li> <li>• Install Server</li> <li>• Update Server</li> <li>• Routine Admin Tasks             <ul style="list-style-type: none"> <li>• User support</li> <li>• Data management</li> <li>• Content management</li> </ul> </li> <li>• Performance Optimization &amp; Troubleshooting</li> <li>• Common SUP Issues</li> </ul> | <ul style="list-style-type: none"> <li>• View Dashboards</li> <li>• Detect Issues             <ul style="list-style-type: none"> <li>• Understand Rollup Visualizations</li> </ul> </li> <li>• View underlying data</li> <li>• Basic diagnostics – e.g. related tags</li> <li>• Document actions</li> <li>• Identify/contact relevant engineers</li> </ul> | <ul style="list-style-type: none"> <li>• Foundations Analytics Skills             <ul style="list-style-type: none"> <li>Identify events, Cleanse, Quantify, Model &amp; Predict, Visualize</li> </ul> </li> <li>• Document work/capture knowledge</li> <li>• Build useful dashboards, reports</li> <li>• Continuous Improvement – improve process &amp; analytics             <ul style="list-style-type: none"> <li>• Continuous Improvement – improve process &amp; analytics</li> <li>• Data management (Implications of interpolation)</li> <li>• Enact analytics at scale/across groups &amp; assets</li> <li>• Adv. Anomaly Detection</li> <li>• Efficiency &amp; Performance</li> <li>• Deploy scripts for use by engineers, etc.</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Understand Rollup Visualizations, &amp; Drill Down</li> <li>• Prioritize</li> <li>• Identify relevant teammates for tasks</li> <li>• Continuous Improvement - ID opportunities for process analytics optimization (changing monitoring KPIs, extending analytics to similar/applicable units &amp; organizations)</li> </ul> |
|--|--|--|---|



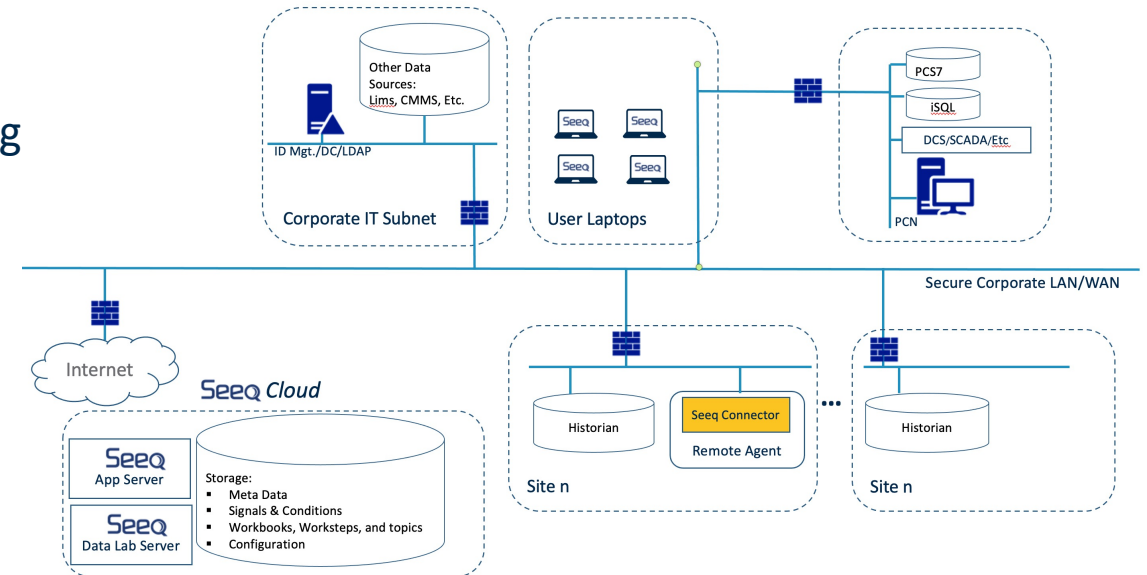
## Build & support mature data structures, individual contributor agency, self-sufficiency

### QuickStart

- How Are Users Using Seeq?
- Analytics Overview, Data & File Types, Data Structuring
- Architecture: Cloud Vs On-prem
- Overview of In-Depth Training

### Live Sessions & Exercises

- Install Server & Connect Data
- Security
- Admin Environments, Navigation, & Tasks
- Server Updates & Maintenance Tasks
- Performance Optimization & Troubleshooting
- Common SUP Issues





# Engineers: Analytics Foundations Skills



## Analytics Foundations Skills

Skill 1: **Identify** Events & periods of interest in the data

Identify when a valve is leaking.

Identify when tank level is decreasing (I.D. change in signal value).

Skill 2: **Quantify** (Calculations & Equations, Aggregations, KPIs)

Quantify from additive flow the amount used & total cost each day.

Calculate average product density & % of time that density was too high each week.

Determine equipment rotational velocity value distribution, and whether it changes by day of week.

Skill 3: **Visualize**

Golden/Reference Profile: Calculate expected behavior of a signal; find deviations.

Develop a dashboard to monitor the status of all units in an asset.

Skill 4: **Model & Predict**

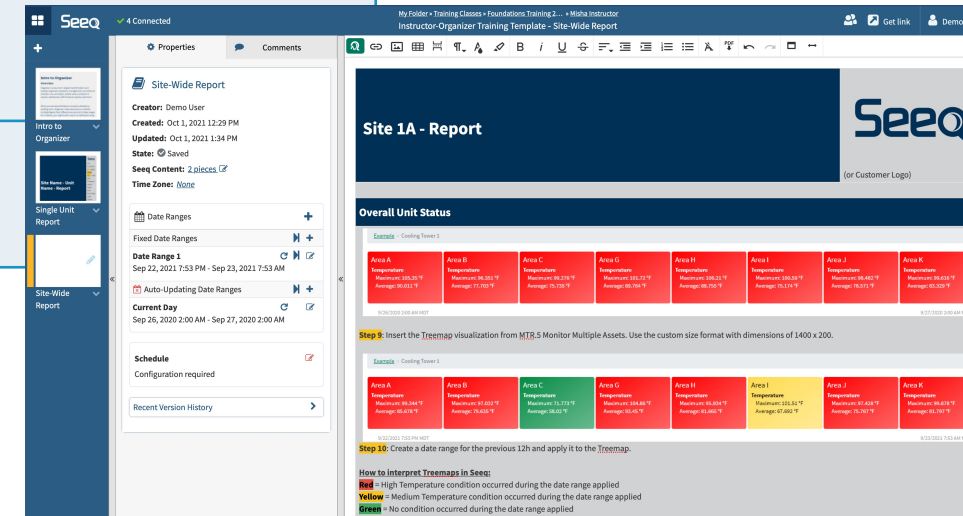
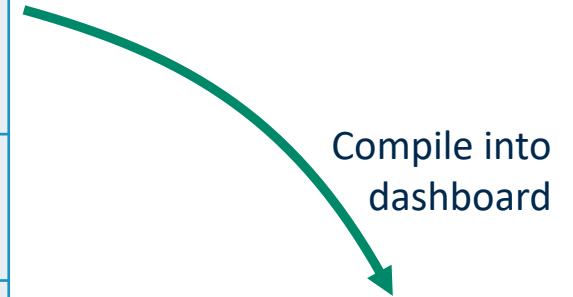
Develop a soft sensor model of the density of a process fluid.

Predict when maintenance will be required on a filter system.

Skill 5: **Cleanse**

Correct a miscalibrated signal; convert units.

Identify and remove outliers and bad data





# Welcome to the Seeq Training & Work Session!

Let's demo the exercises!

## Follow link in chat to class folder

- <https://learn.seeq.com/D340B18B-6CD9-45C8-9921-0F2D403DAF9A/folder/>
- Click on the folder with your name

The screenshot displays the Seeq software interface. The top navigation bar shows 'Seeq' and '23 Connected'. The main content area is titled 'Finding Conditions (Periods of Interest)'. The 'Objective' is to find periods when a signal has a certain value or is above/below a threshold. The 'Data' section describes the signal as 'Any varying signal, preferably 2 signals that vary and have a given relationship'. The 'Steps' section includes: 1. Load Signals (if an asset tree exists, add the first signal by navigating through the asset tree; alternatively, search for the tag name in the Data tab search bar; add signal name labels in the display pane). 2. Use [ ] to identify periods when the signal is above or below a given meaningful threshold, or has a given value, for 15 minutes or more. The 'Condition Definition' section shows a partially visible definition. The right side of the interface shows a data visualization area with a timeline and a data plot. A text box in the center of the plot area says: 'Add data to this display via the Data tab. You can search for signals (aka tags) directly, or you can navigate through an Asset Tree.'



# Operators (Content Consumers)

## Interpreting Data, Basic Diagnostics, Documentation

- 1: Open auto-updating report. From visualizations and colleague notes, determine which alarm is highest-priority. Review the associated process schematic to get familiar with the flows involved.
- 2: View underlying trend in the report. Change the date range to determine the alarm duration.
- 3: Drill down into trend underlying alarm; determine which Flow (A1, A2, A3) seems to be associated with the alarm. Document your findings.
- 4: From the schematic, load related tags (Valves A1-1, A1-2, A1-3) and see which one might be causing the issue. Note on the diagnostic report sheet.
- 5: Note your actions on the shift hand-over report

Start with dashboard from engineers

The screenshot displays the Seeq software interface. On the left, a sidebar shows navigation options: 'Intro to Organizer', 'Site-Wide Report', 'Single Unit Report', and 'Site-Wide Report'. The main content area is split into two panels. The left panel shows the 'Properties' for a 'Site-Wide Report', including details like 'Creator: Demo User', 'Created: Oct 1, 2021 12:29 PM', 'Updated: Oct 1, 2021 1:34 PM', 'State: Saved', 'Seeq Content: 2 pieces', and 'Time Zone: None'. It also shows 'Date Ranges' with a 'Fixed Date Range' of 'Sep 22, 2021 7:53 PM - Sep 23, 2021 7:53 AM' and an 'Auto-Updating Date Range' for the 'Current Day' from 'Sep 26, 2020 2:00 AM - Sep 27, 2020 2:00 AM'. The right panel shows the 'Site 1A - Report' dashboard, which includes an 'Overall Unit Status' section with a grid of temperature data for various areas (A through K). The data is color-coded: red for high temperature, yellow for medium, and green for no condition. Below the dashboard, there are instructions for using the Treemap visualization and a legend for interpreting the colors.

Area	Temperature	Maximum	Average
Area A	Temperature	Maximum: 105.35 °F	Average: 85.81 °F
Area B	Temperature	Maximum: 96.21 °F	Average: 77.72 °F
Area C	Temperature	Maximum: 99.27 °F	Average: 78.25 °F
Area G	Temperature	Maximum: 102.72 °F	Average: 85.74 °F
Area H	Temperature	Maximum: 106.21 °F	Average: 85.74 °F
Area I	Temperature	Maximum: 102.59 °F	Average: 78.24 °F
Area J	Temperature	Maximum: 96.82 °F	Average: 78.12 °F
Area K	Temperature	Maximum: 98.69 °F	Average: 83.29 °F

**Step 8:** Insert the Treemap visualization from MTR.5 Monitor Multiple Assets. Use the custom size format with dimensions of 1400 x 200.

**Step 10:** Create a date range for the previous 12h and apply it to the Treemap.

**How to Interpret Treemaps in Seeq:**  
**Red** = High Temperature condition occurred during the date range applied  
**Yellow** = Medium Temperature condition occurred during the date range applied  
**Green** = No condition occurred during the date range applied



# Data Scientists/People Who Script

## 3 Learning Courses:

### 1. Foundations Analytics Skills

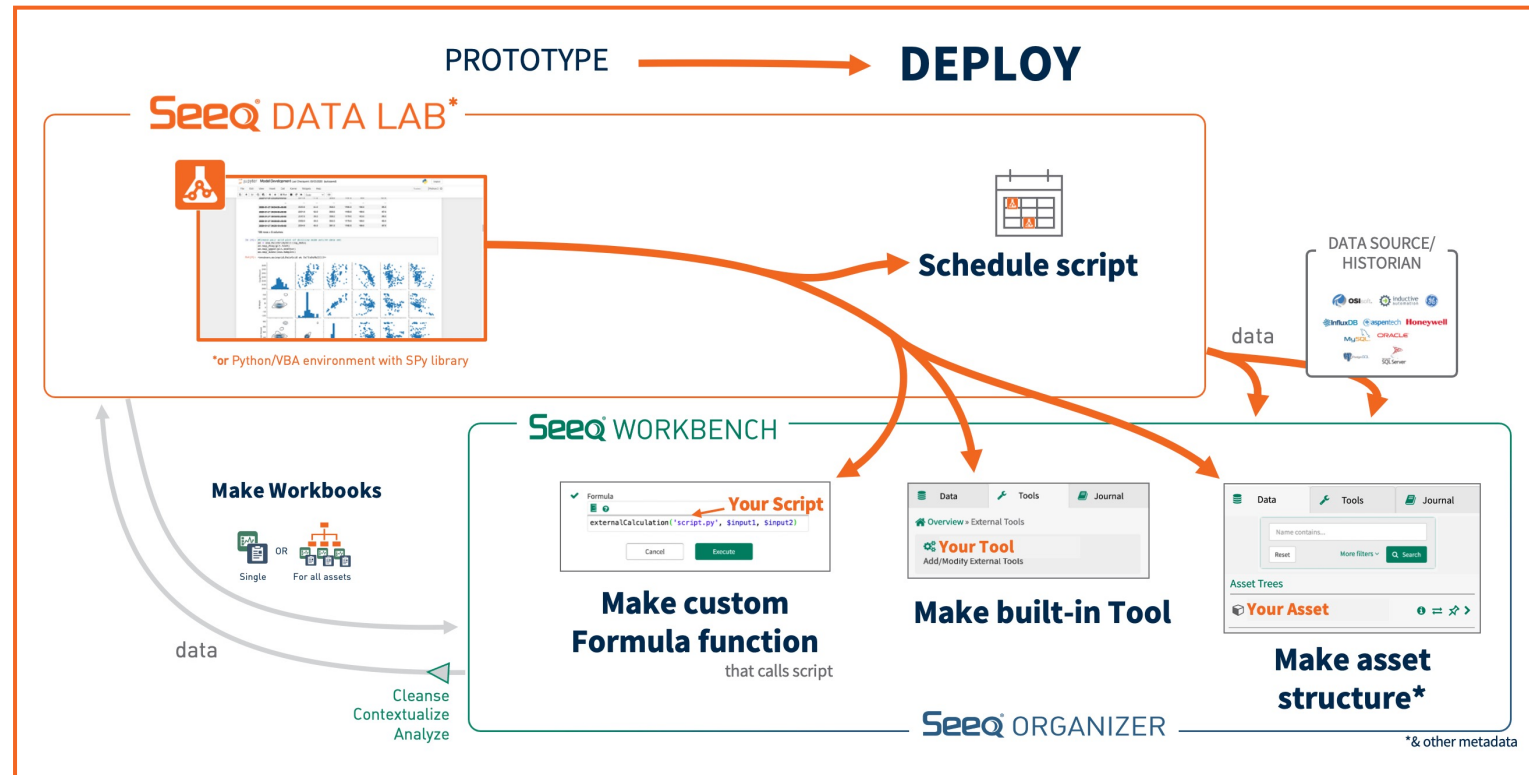
With a focus on “Automate where possible, script when necessary”

### 2. Advanced Seeq

Adv. Anomaly Detection & Calculations, Diagnostic Techniques, Computational Performance, Adv. Modeling & Prediction, Selected Seeq ML Add-Ons, Data & Metadata Permissions & Management, Interpolation

### 3. Seeq DATA LAB

- Bring Your Own Algorithm - Deploying Scripts
- Deploying analytics across data asset structures
- Scheduling & automation





# Instructor Training

- Technical Communication
- Learning Philosophy
- Soft Skills, Classroom Management
- Material Prep
- (Virtual) Delivery Logistics

## Pre-Reqs:

- Live Foundations training
- Certified Partner Analytics Engineer

## OBSERVE:

Watch and reflect on live training examples

## LEAD:

Lead Foundations Training with Seeq Trainer assisting\*

Seeq provides ongoing updates (e.g., new features & materials)



## LEARN:

Attend Certified Instructor Training session

## PRACTICE:

Give Seeq overview and teach an exercise to a Seeq Trainer\*

**Instructor Certification Awarded**



\*More than one session may be required

# Learning Engagement



Individual

Organization

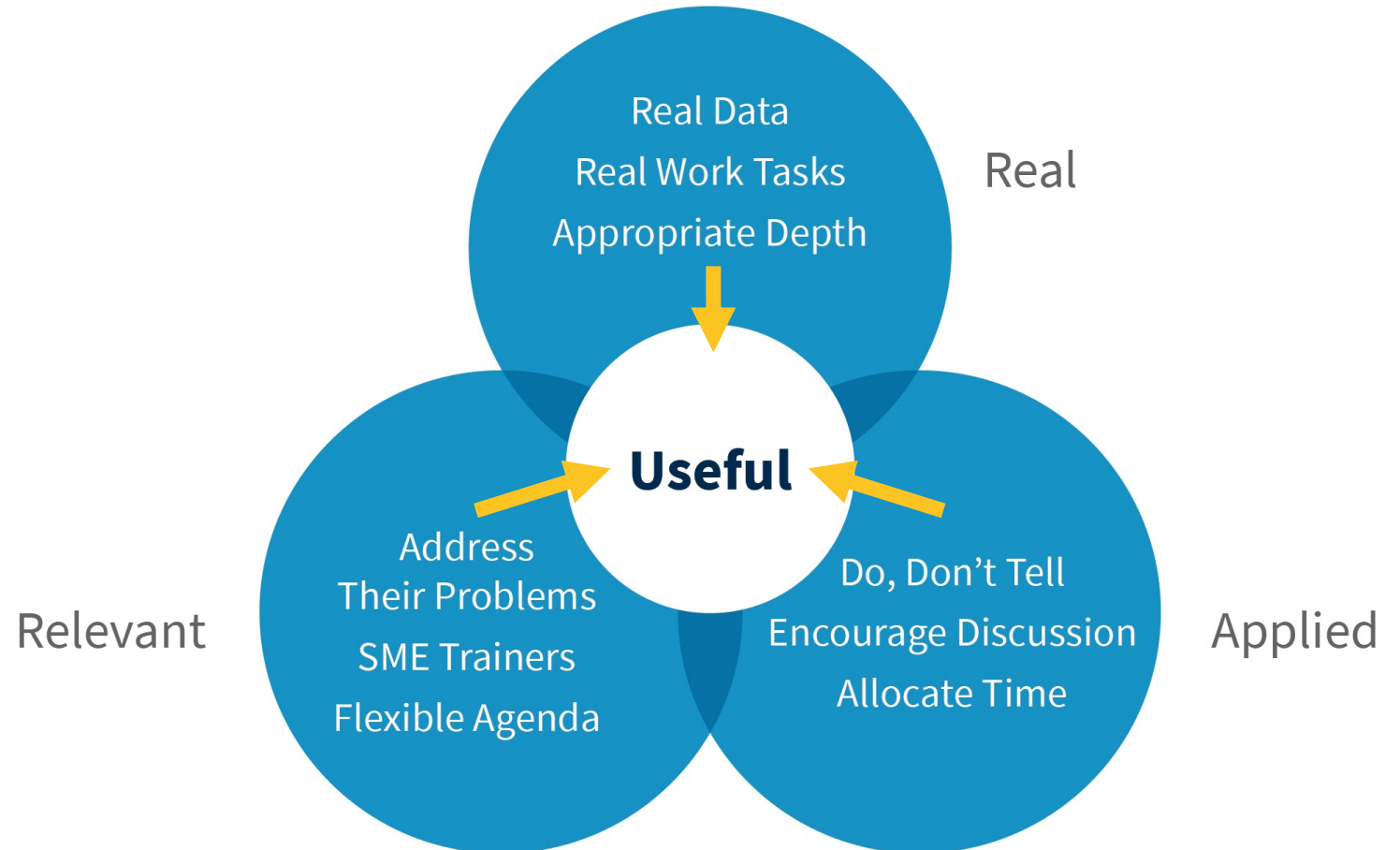
# Learning Engagement

1. People only learn when they are **personally motivated** to engage.

## What's in it for me?

2. Remember new information by associating it with preexisting memories.

## Training should be



# Individual Engagement: Learners Absorb, Retain, & Use New Skills



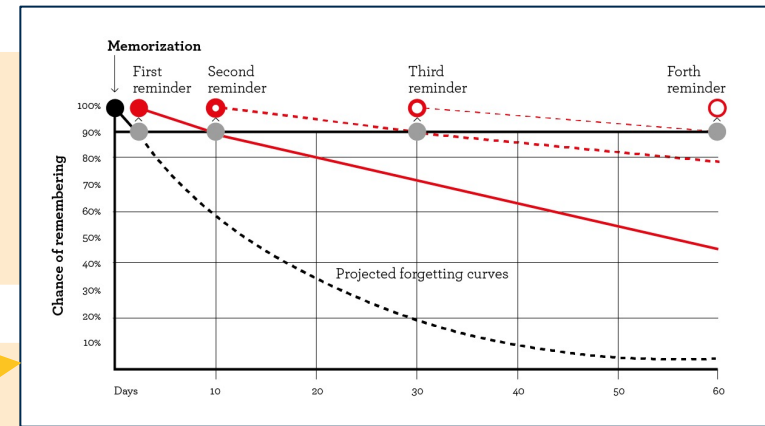
**Real, Relevant, & Applied = Useful**



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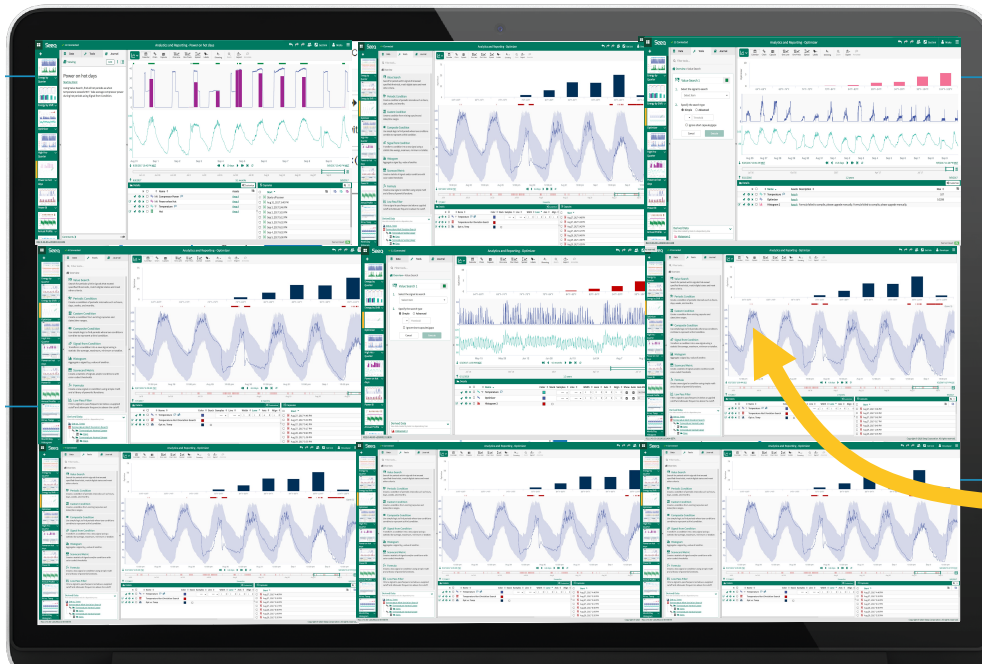
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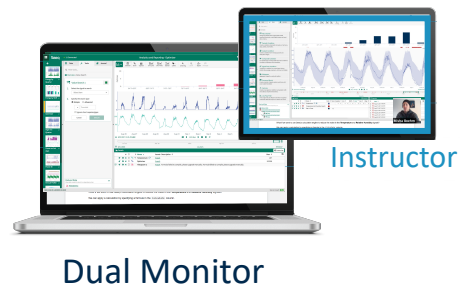
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# Live Virtual Training

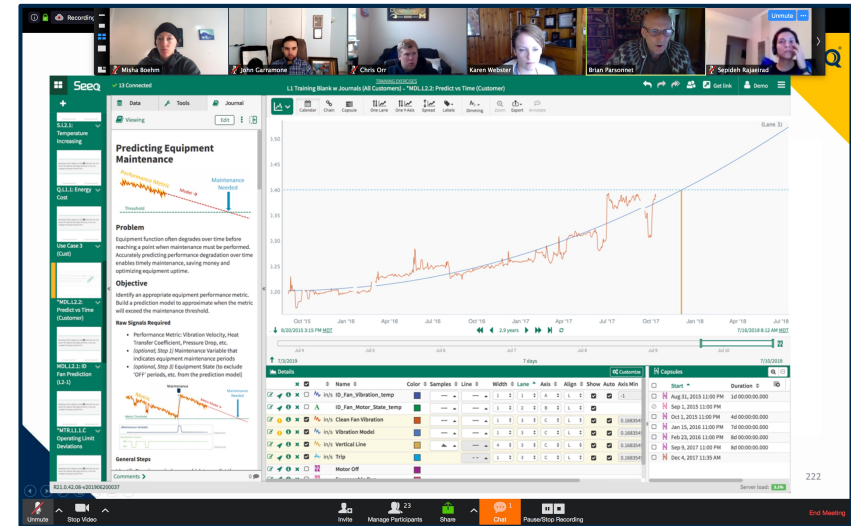
## Browser-Based Collaboration



### Flexible Learner Setup



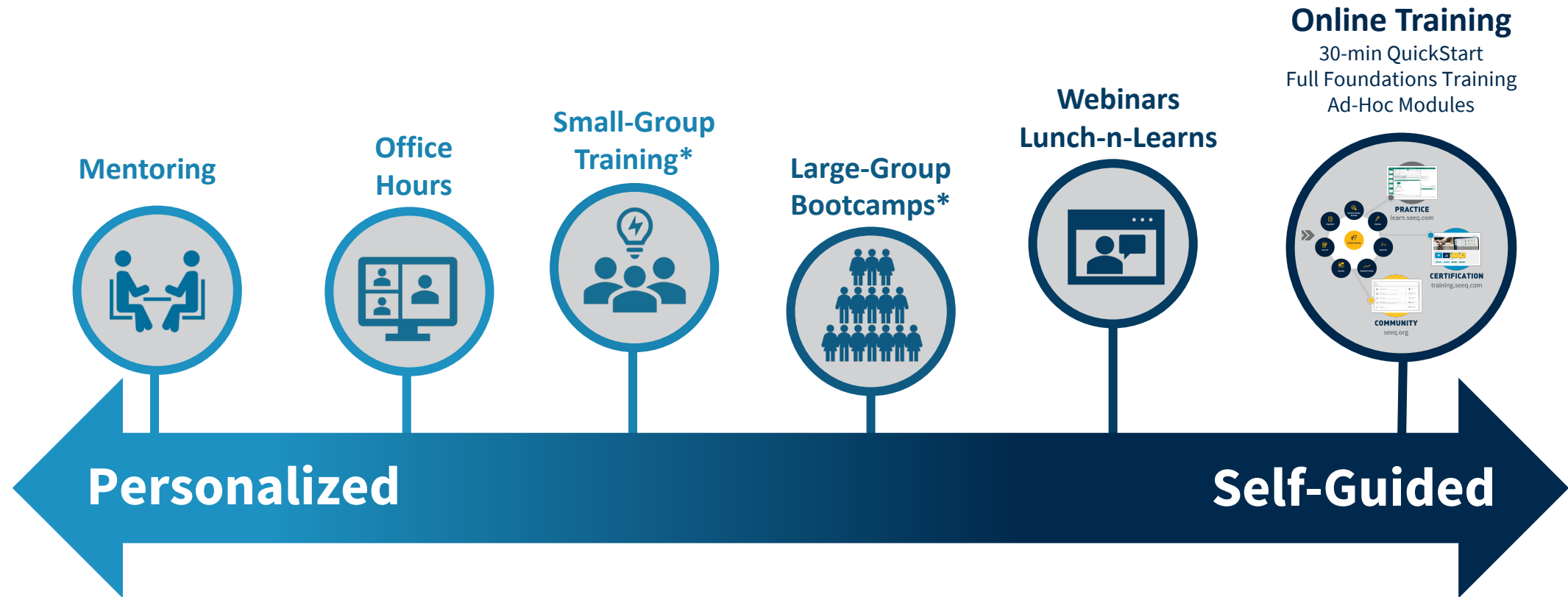
Dual Monitor



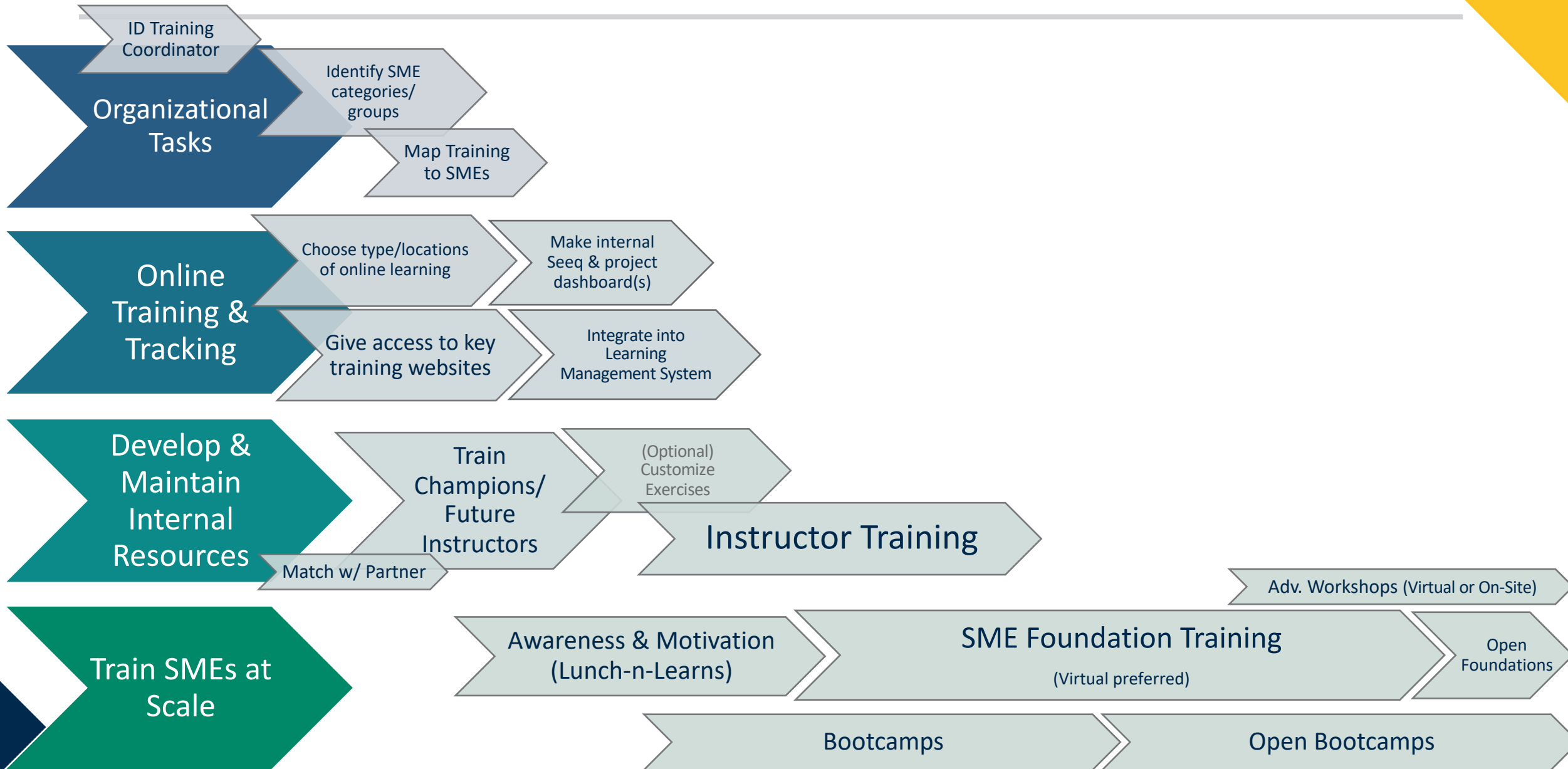
- Instructors see each learner at work
- Adjust pacing, revisit topics as necessary
- Easier screensharing, troubleshooting
- Easy to see and hear instructor
- Train dispersed groups
- Save on travel costs
- Flexible scheduling/Less disruptive to workday



# Training to Enhance **Analytics Insights & Adoption at Scale**



# Organizational Engagement: Training Planning Roadmap



# Questions/Comments?

**Thanks to:**

**Brian Parsonnet**

**Chris Hamlin**

**Des Evans**

Lisa Graham, Nick Gigliotti, Teddy Turfitt, Krista Novstrup, Sanman Mehta, Andrew Ogden-Swift, Michelle Hart, Karen Webster, John Garramone, Brian Crandall, Morgan Bowling, Lindsey Wilcox, Allison Buenemann, Thorsten Vogt, Joanna Zinsli, Sharlinda Salim, Kin How Chong, Chris Chin, Hari Jeyabalan, Joe Reckamp, John Cox, Kris Wiggins, Chris Orr, Wolfgang Weiss, Jeff Tropsa, Sean Tropsa, Emily Johnston, Graham McHardy, Paul Milne, Kjell Raemdonck, Selmane Sekkai, Sepide Zakeri, Heather Riddles, Jenne Bentzel, Will Knight, Mike Dou, Michael Fitzgerald, Jim Cunningham, Michael Risse