

NOVEMBER 2022

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# Unlock Your Plant's Data and Enable A Connected Workforce

Elliott Middleton – Damien Rouge

**AVEVA**

# World-class operations



## Challenge

- Information on Operations isn't very accessible or easy to leverage beyond the control room
- Security needs of the Control Network severely complicate expanding access



## Solution

- AVEVA Insight is the 'first source' of operational information for everyone except front line operators



## Benefits

- Better decision making informed by readily accessible operational data
- Enriched by analytics solutions

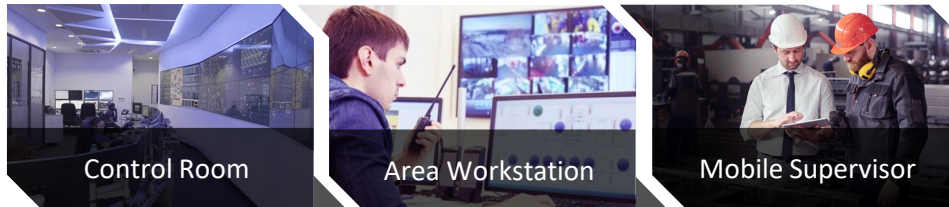
# On Premise Components

## Hybrid SaaS Industrial Operations

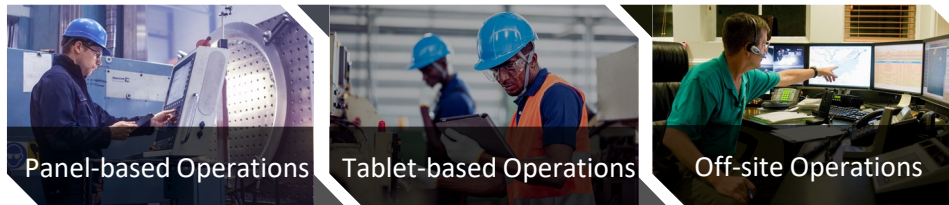
- Enterprise



- Supervisory



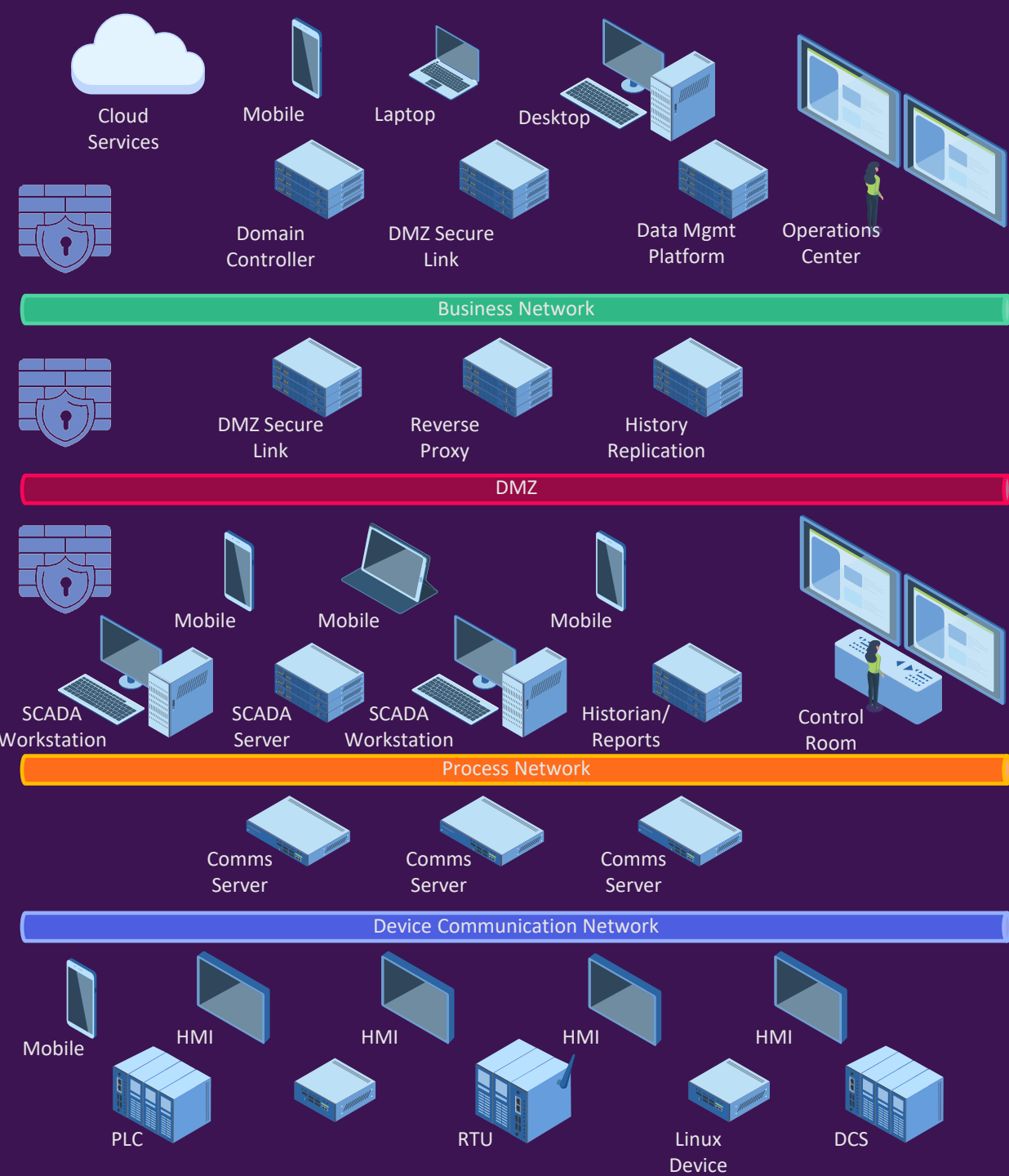
- Edge



Enterprise

Supervisory

Edge



# On Premise Components

## Hybrid SaaS Industrial Operations

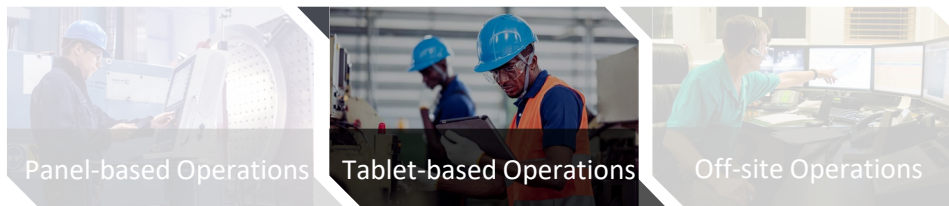
- Enterprise



- Supervisory



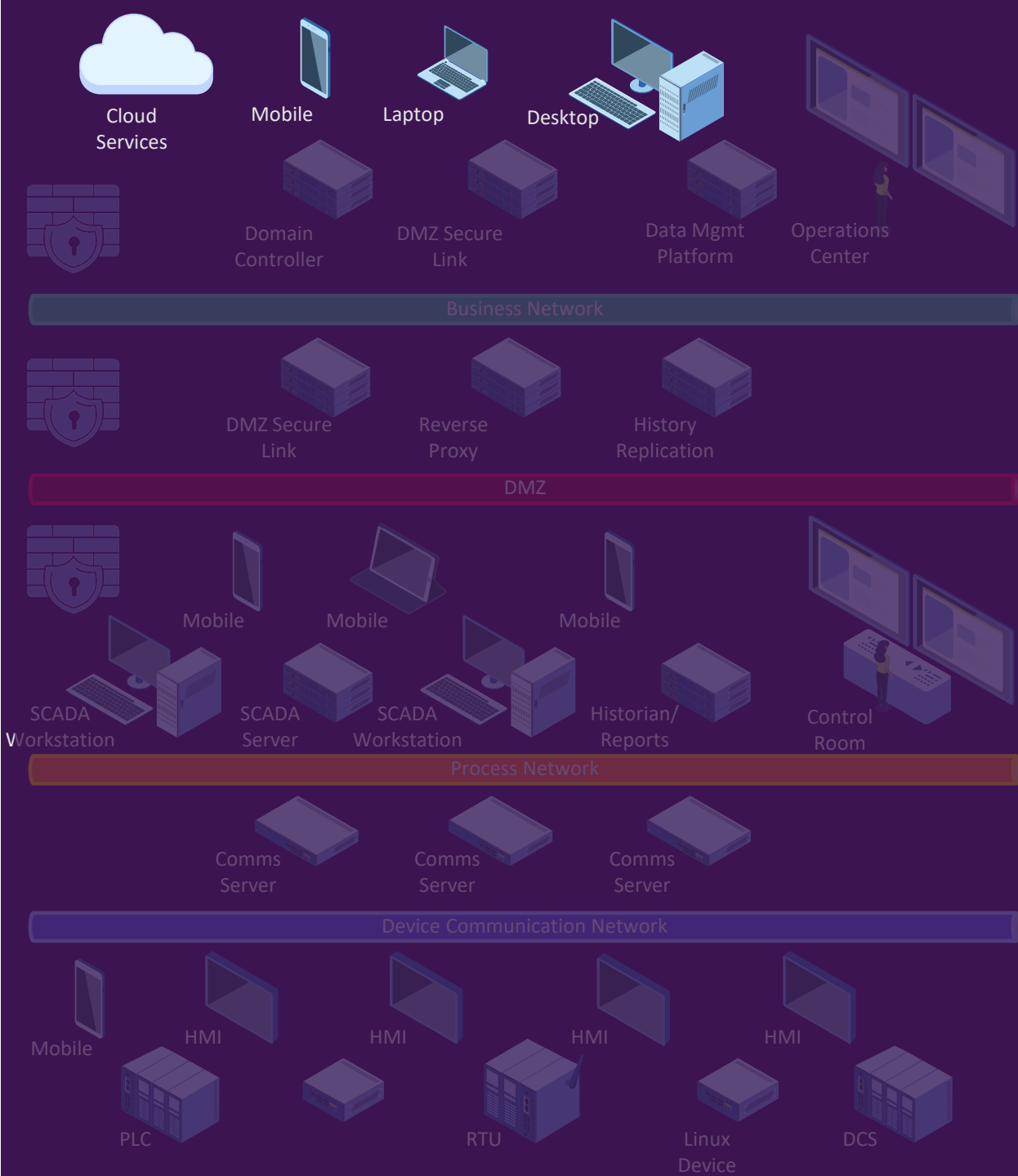
- Edge



Enterprise

Supervisory

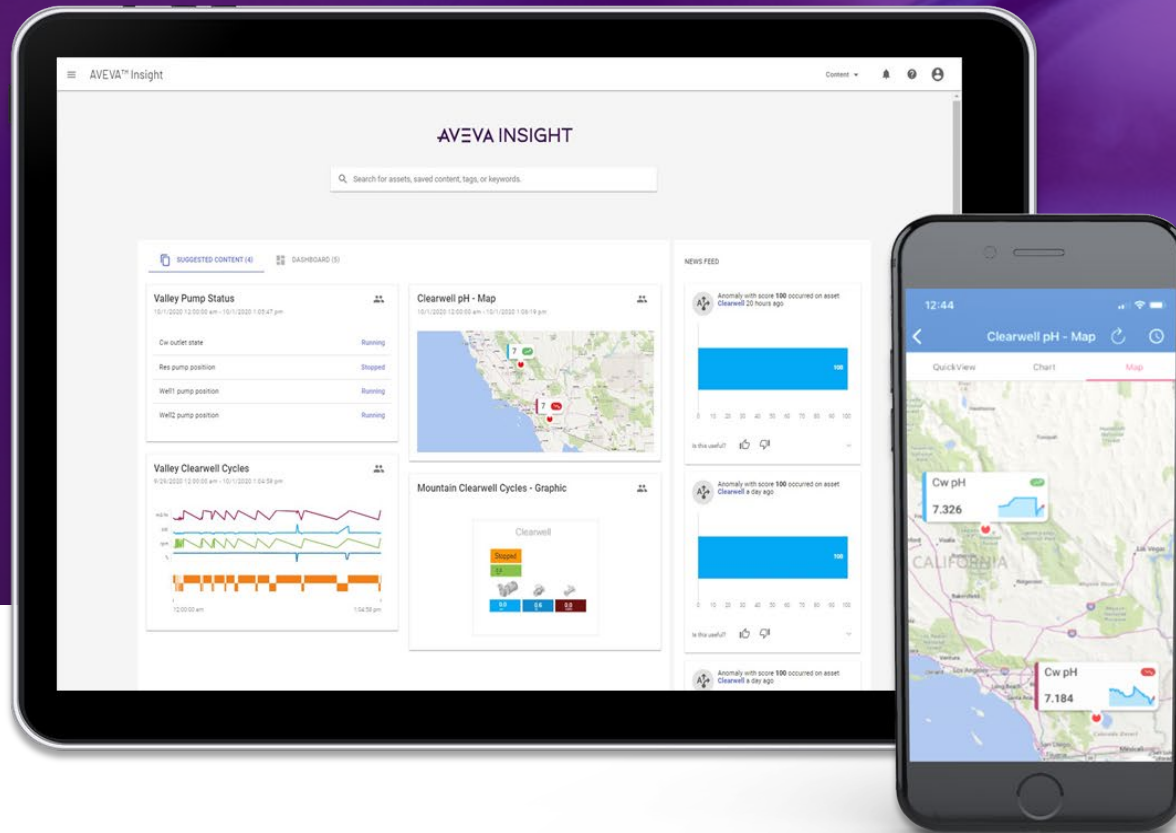
Edge





# AVEVA™ Insight

Make better and faster decisions with complete visibility of your operations in the cloud.



- Unlock critical data
- Increase collaboration
- Improve asset reliability
- Optimize operational performance

# AVEVA Insight Highlights



New Experience



Year In Review



Expressions



Near-Term Enhancements



AVEVA Insight & AVEVA™ Data Hub



Analytics



# AVEVA Insight Highlights

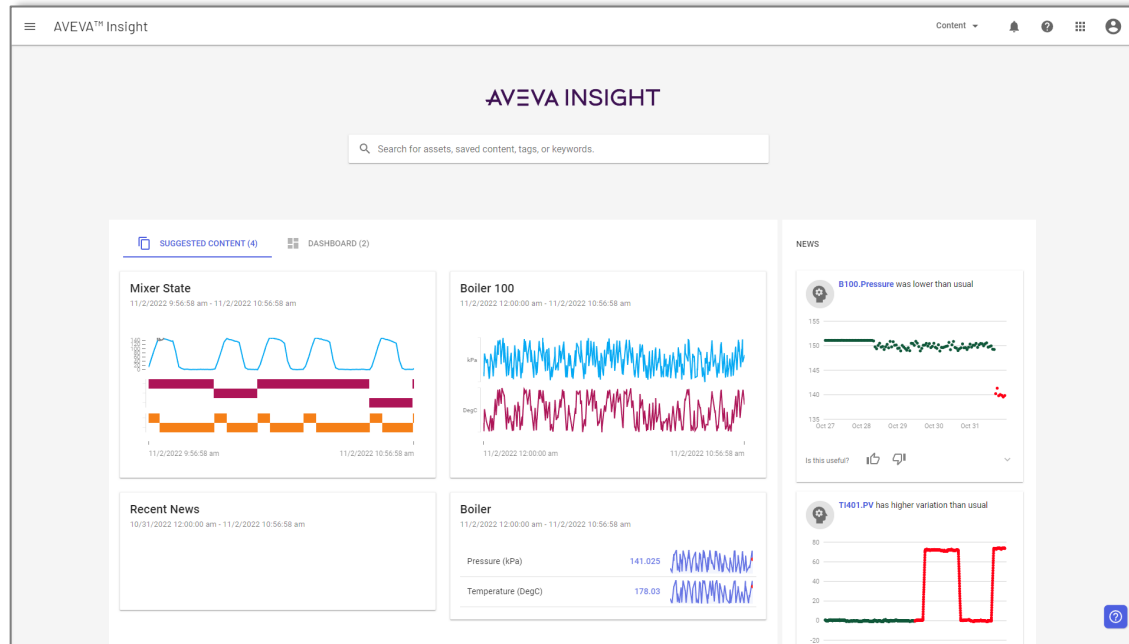


New Experience

# Experiences

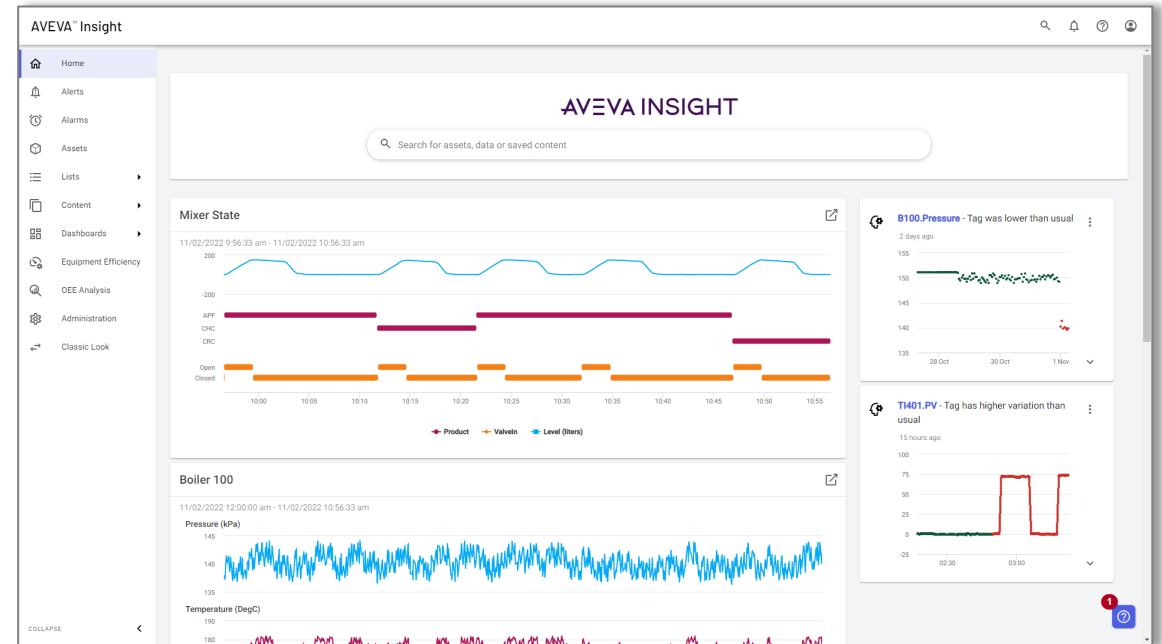
- Most features in both
- Some transitioning to only “New”

## Classic



- Mature, stable
- Older technology

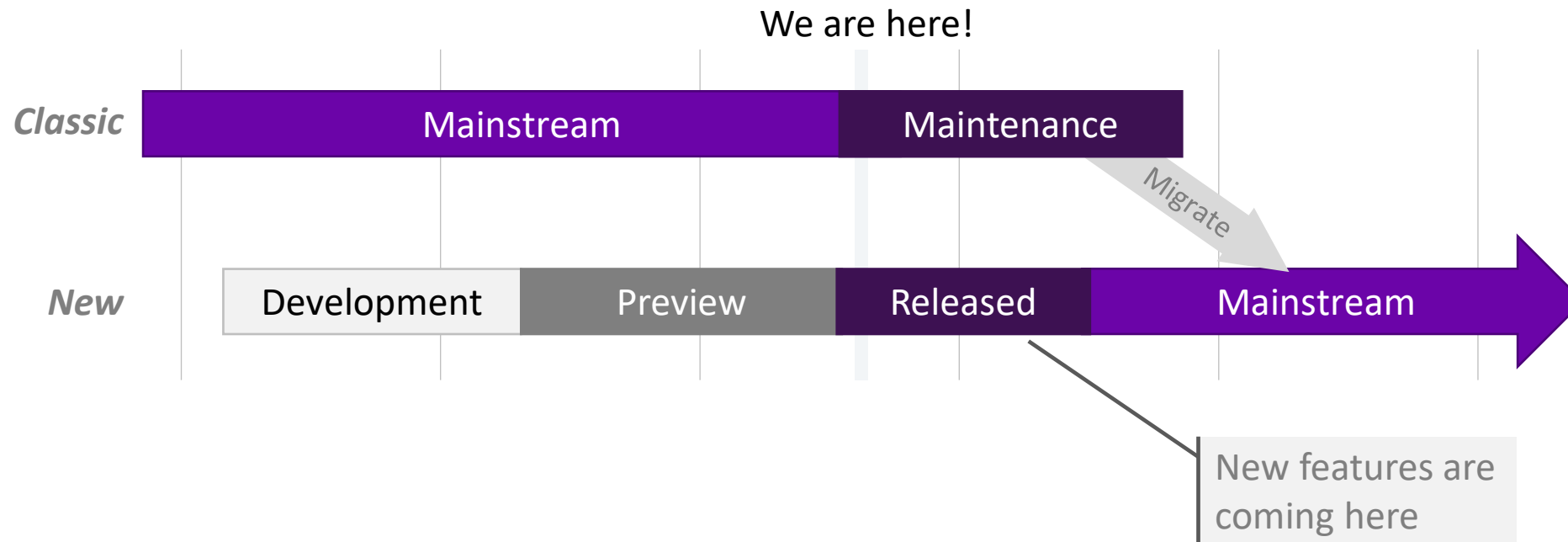
## New



- Better performance
- Improved workflow (dashboards)
- Focus of development

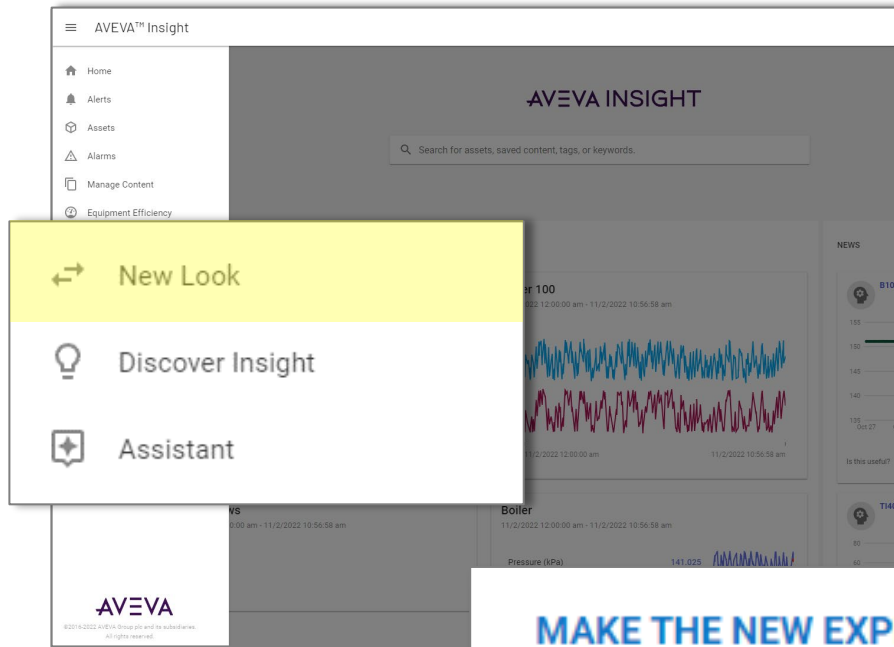


# AVEVA Insight: Classic & New



# Experiences

## Classic



### User Profile

#### NAME

Elliott Middleton

#### EMAIL ADDRESS

elliott.middleton@aveva.com

#### SOLUTION

IntWonderWater

#### ACCOUNT

elliott.middleton@aveva.com

#### SOLUTION ID

d86b388d-dadb-4675-8304-b45dca8c24da

#### SUBSCRIPTION TYPE

Trial

#### LOCATION

IntWonderWater

#### PHONE NUMBER

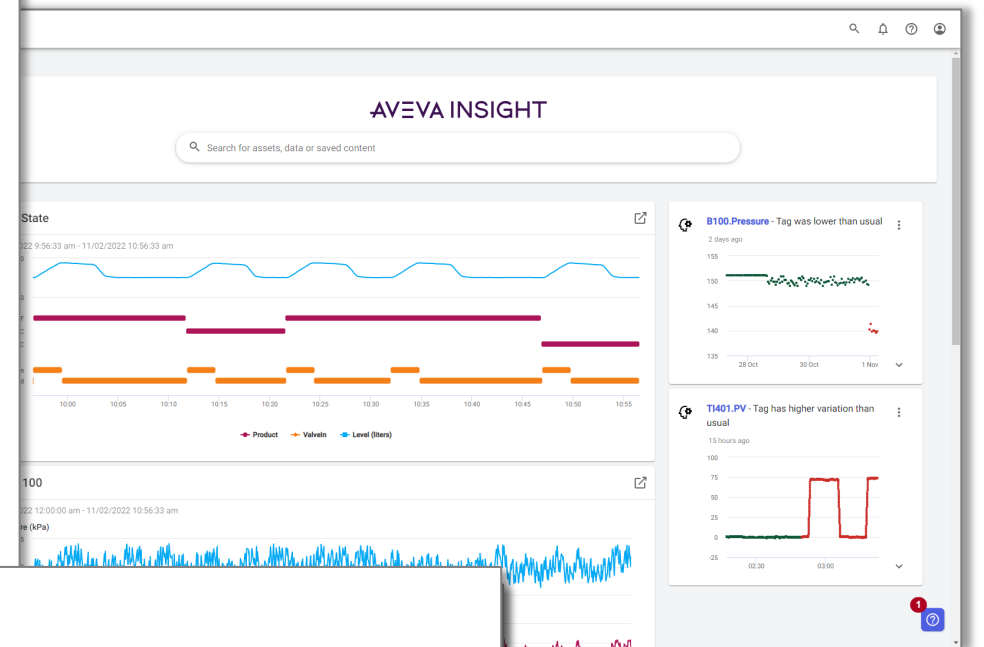
Not provided

#### SEND ALERTS TO MY EMAIL ADDRESS

Send an email each time one of my alerts is raised in solution IntWonderWater.



## New



### MAKE THE NEW EXPERIENCE MY DEFAULT

Use the new experience and take advantage of new and improved capabilities. Hide the classic experience.



*Out of “preview” and now mainstream*

# AVEVA Insight Highlights



New Experience



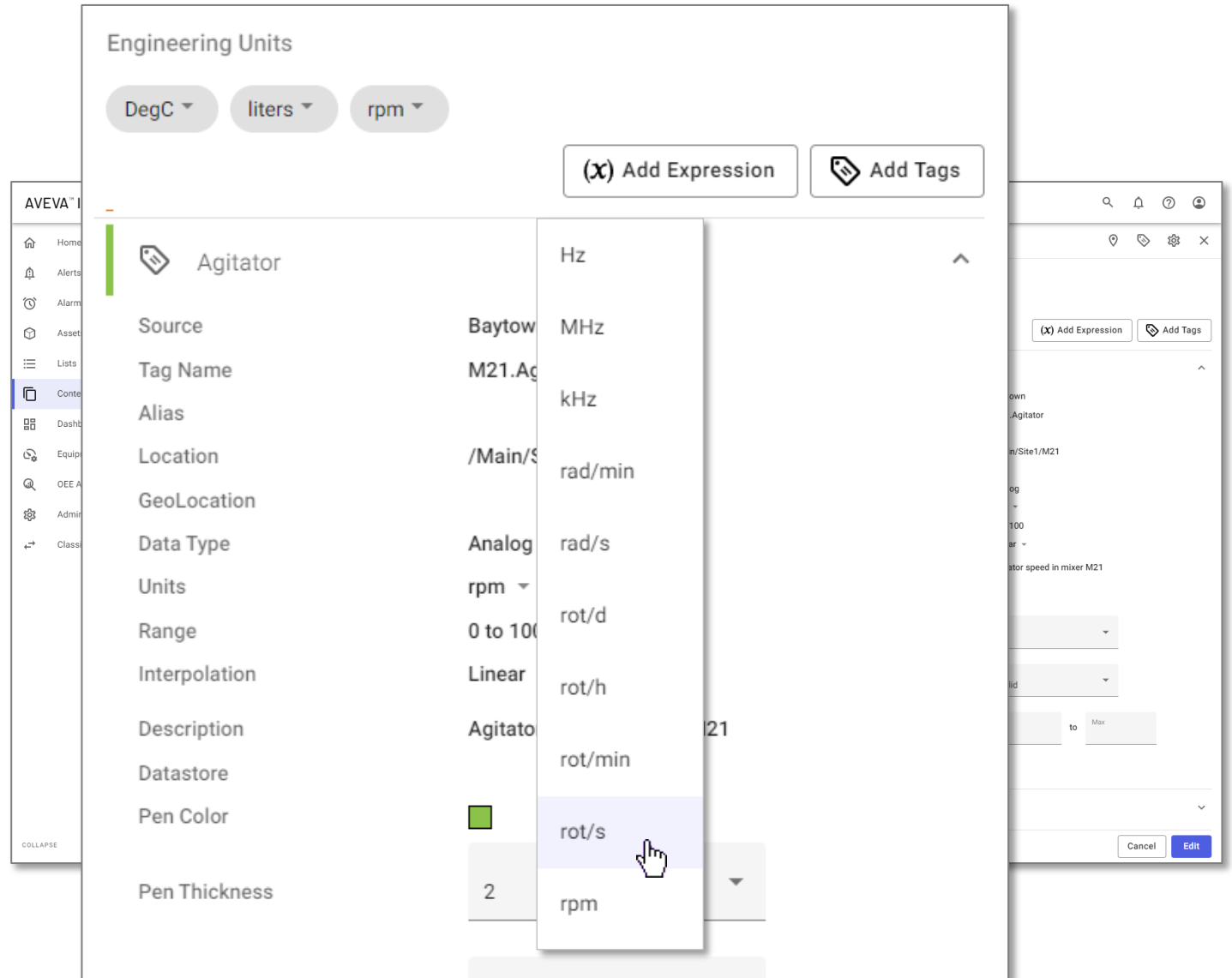
Year In Review

# Unit Conversion

- Most useful for scale
  - liters → cubic meters
  - gallons/minute → barrels/day
  - bar → kilopascals
- Preserves existing site labels

L/sec	Liters
l/s	litres

- Administrator: Must associate label to formal “catalog”
- Custom units not fully support *yet*



# Enabling Engineering Unit Conversion

AVEVA™ Insight

Engineering Units

Engineering Unit Catalog

gal/d Properties

Unit Name  
gal/d

Select a catalog dimension  
Volumetric Flow (US)

Select a catalog symbol  
gal/d

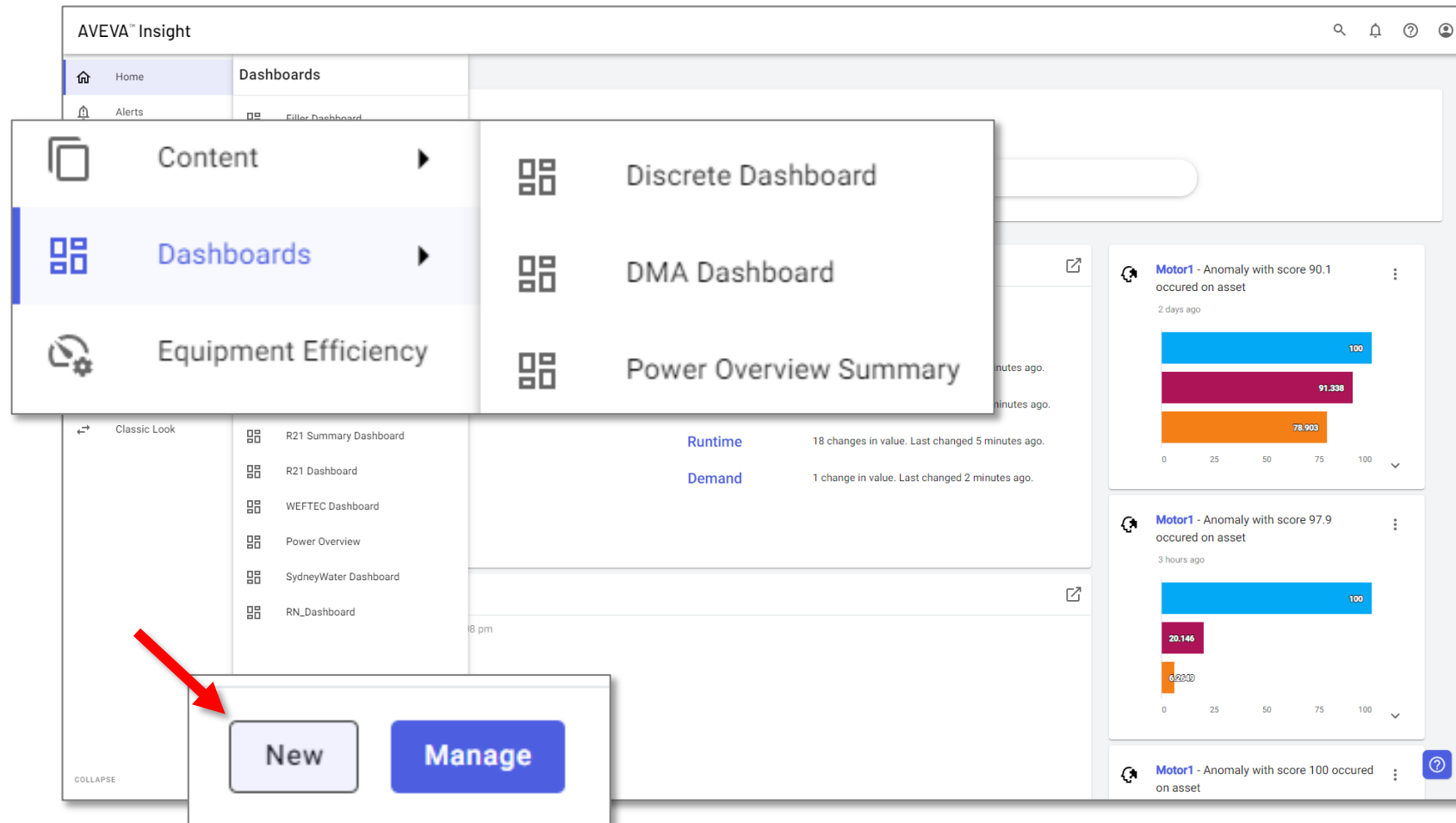
Save

<input type="checkbox"/> Unit	Symbol	Dimension ↑	System
<input type="checkbox"/> liters/min	?	Unknown	General
<input type="checkbox"/> sec	?	Unknown	General
<input type="checkbox"/> gal/d	?/d	Unknown Rate	General
<input type="checkbox"/> gal/h	?/h	Unknown Rate	General
<input type="checkbox"/> gal/min	?/min	Unknown Rate	General
<input type="checkbox"/> gal	gal	Volume	US
<input type="checkbox"/> hL	hL	Volume	SI
<input type="checkbox"/> hl	hL	Volume	SI

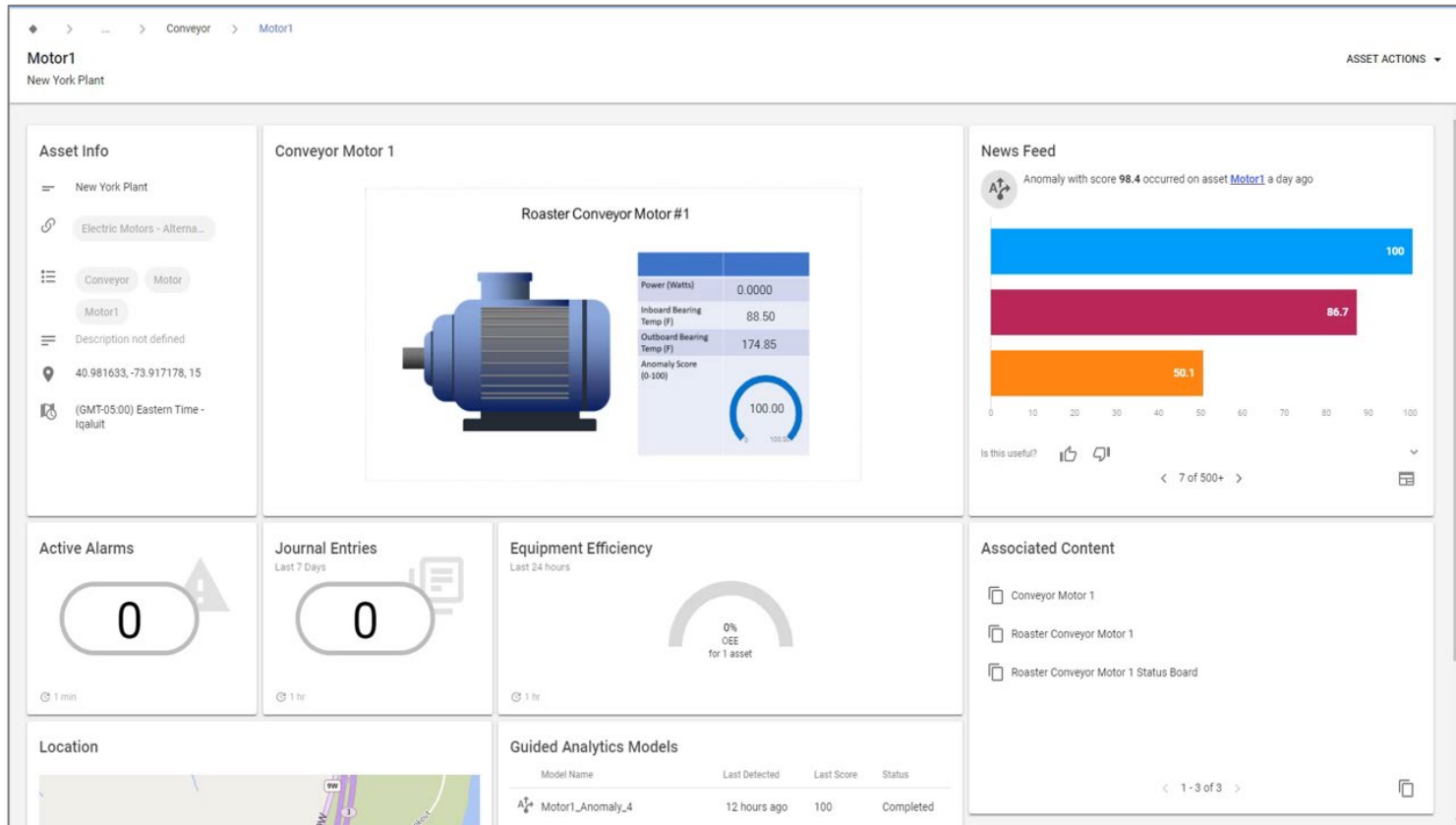


# Creating Dashboards

## Streamlined Workflow

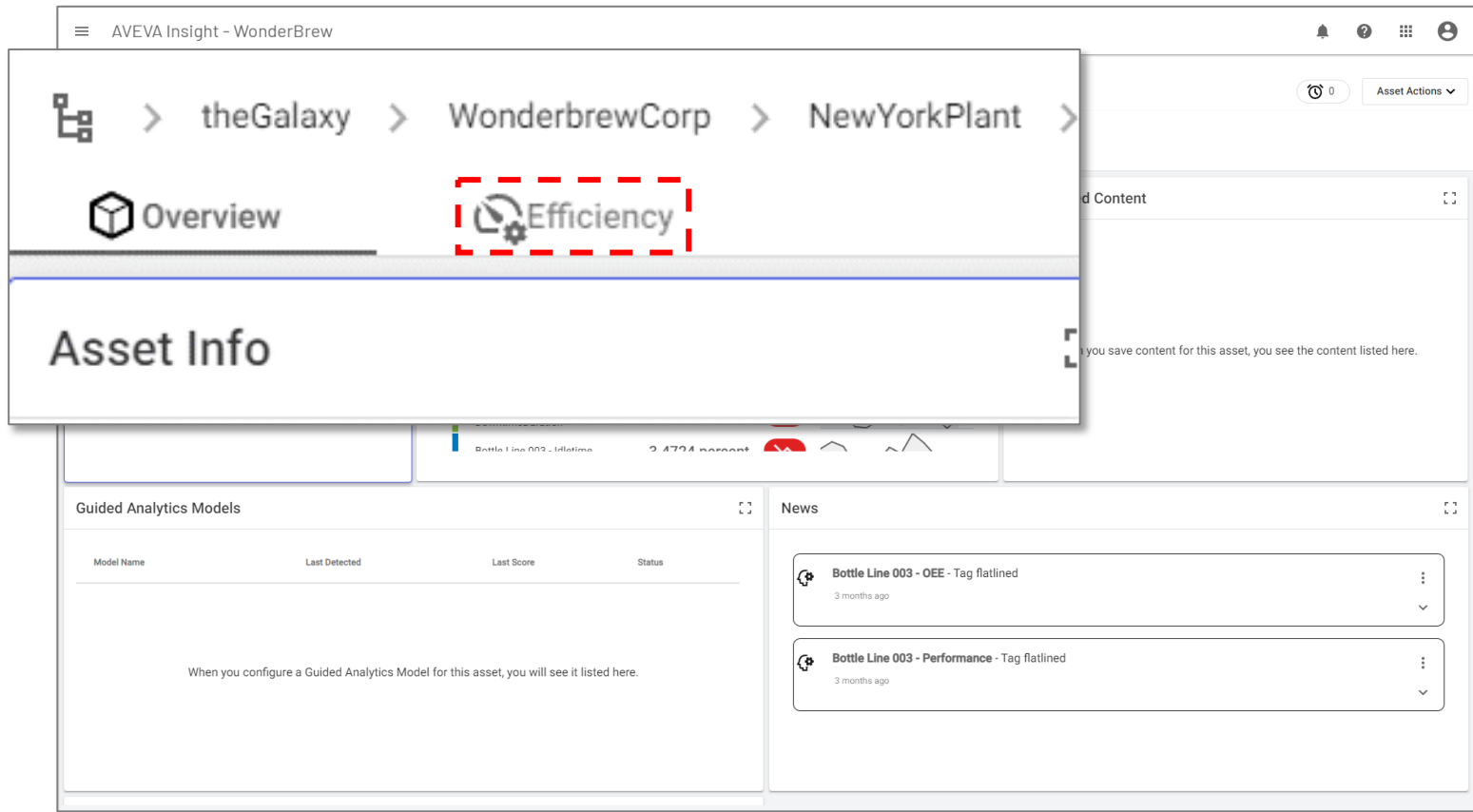


# Classic Asset Page



- Auto-generated
- Fixed layout

# New Asset Page



- Auto-generated
- When configured, includes “Efficiency” tab

- 🏠 Home
- 🔔 Alerts
- ⚠️ Alarms
- 📦 Assets
- ☰ Lists
- 📄 Content
- 📊 Dashboards
- 🕒 Equipment Efficiency
- 📈 OEE Analysis

Mash100

⚠️ 0

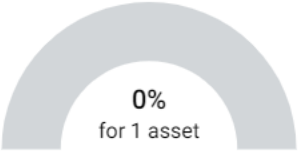
Asset Actions ▾

🏠 > theGalaxy > WonderbrewCorp > LondonPlant > Mashing > Mash100 ▾

📦 Overview **🕒 Efficiency** 📊 Mash100.Dashboard

OEE

07/13/2022 10:49:08 pm - 07/14/2022 10:49:08 am



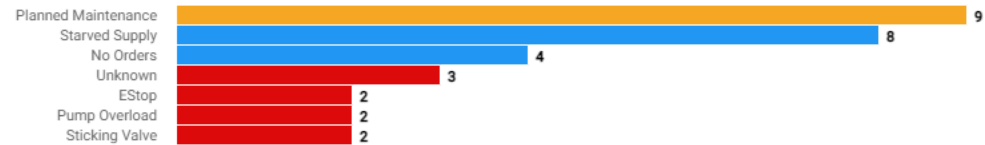
Utilization Event Timeline

07/13/2022 10:49:08 pm - 07/14/2022 10:49:08 am



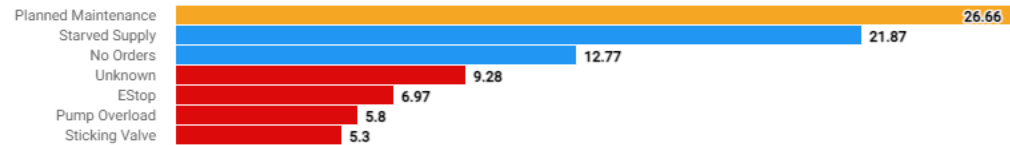
Top Utilization Reasons by Count

07/13/2022 10:49:08 pm - 07/14/2022 10:49:08 am



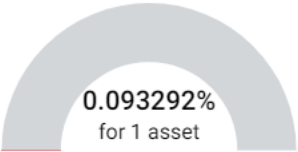
Top Utilization Reasons by Duration

07/13/2022 10:49:08 pm - 07/14/2022 10:49:08 am



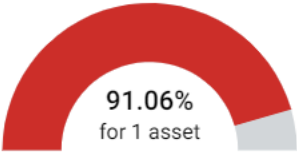
Performance

07/13/2022 10:49:08 pm - 07/14/2022 10:49:08 am



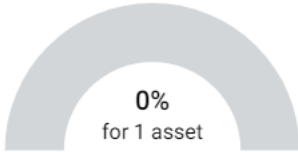
Availability

07/13/2022 10:49:02 pm - 07/14/2022 10:49:02 am

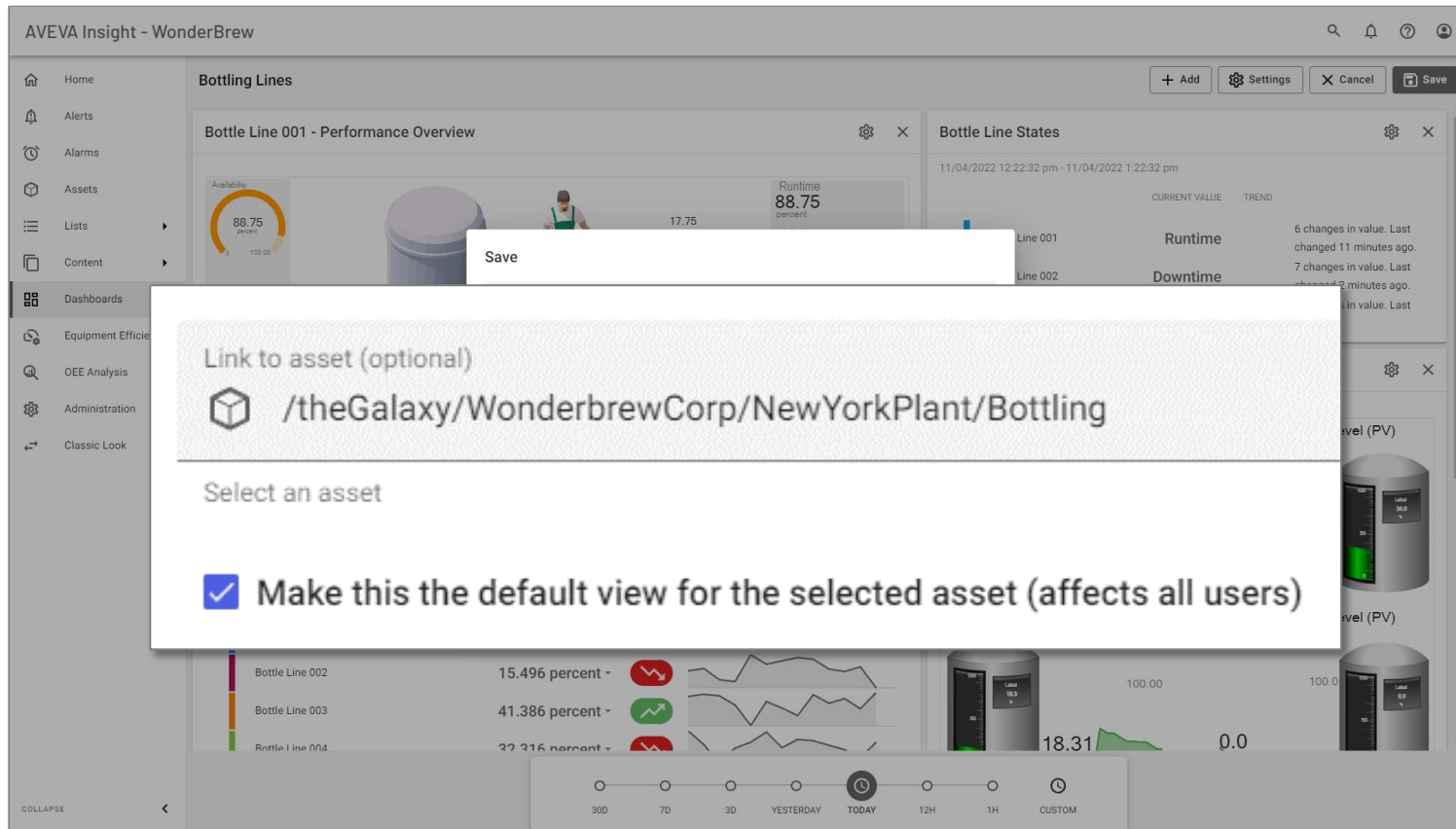


Quality

07/13/2022 10:49:08 pm - 07/14/2022 10:49:08 am



# New Asset Page



- Auto-generated
- When configured, includes “Efficiency” tab
- Can be fully customized
  - Create dashboard
  - Share with Team
  - Link to Asset
  - Check “Make default”



- 🏠 Home
- 🔔 Alerts
- ⚠️ Alarms
- 🏠 Assets
- ☰ Lists
- 📄 Content
- 🖼️ Dashboards
- 🕒 Equipment Efficiency
- 📊 OEE Analysis

Mash100

⚠️ 0

Asset Actions ▾

theGalaxy > WonderbrewCorp > LondonPlant > Mashina > Mash100 ▾

🏠 Overview

🕒 Efficiency

Mash100.Dashboard

Mash100.Operations.Graphic

Dark Malt  
RBB-02417

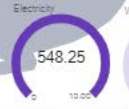
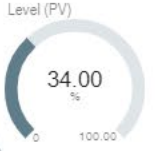
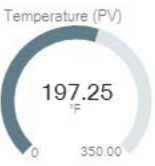
Agitator AuxContact  
OFF



Running  
Holding 2

ProductionID  
PR-A113071119397381

Wort (Dark Ale)  
GW-1307111943



Mash100.QuickView.Status

07/14/2022 12:00:00 am - 07/14/2022 10:49:35 am

	CURRENT VALUE	TREND
MaterialID	Wort (Dark Ale)	
ProductionID	PR-A113071119397381	
State	Running	
Status	Holding 2	
Utilization	Running (Normal)	
UtilizationState	Runtime	

Mash100.Energy.LineChart

07/14/2022 9:49:35 am - 07/14/2022 10:49:35 am

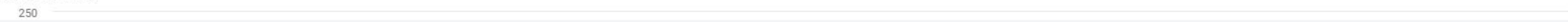
Electricity



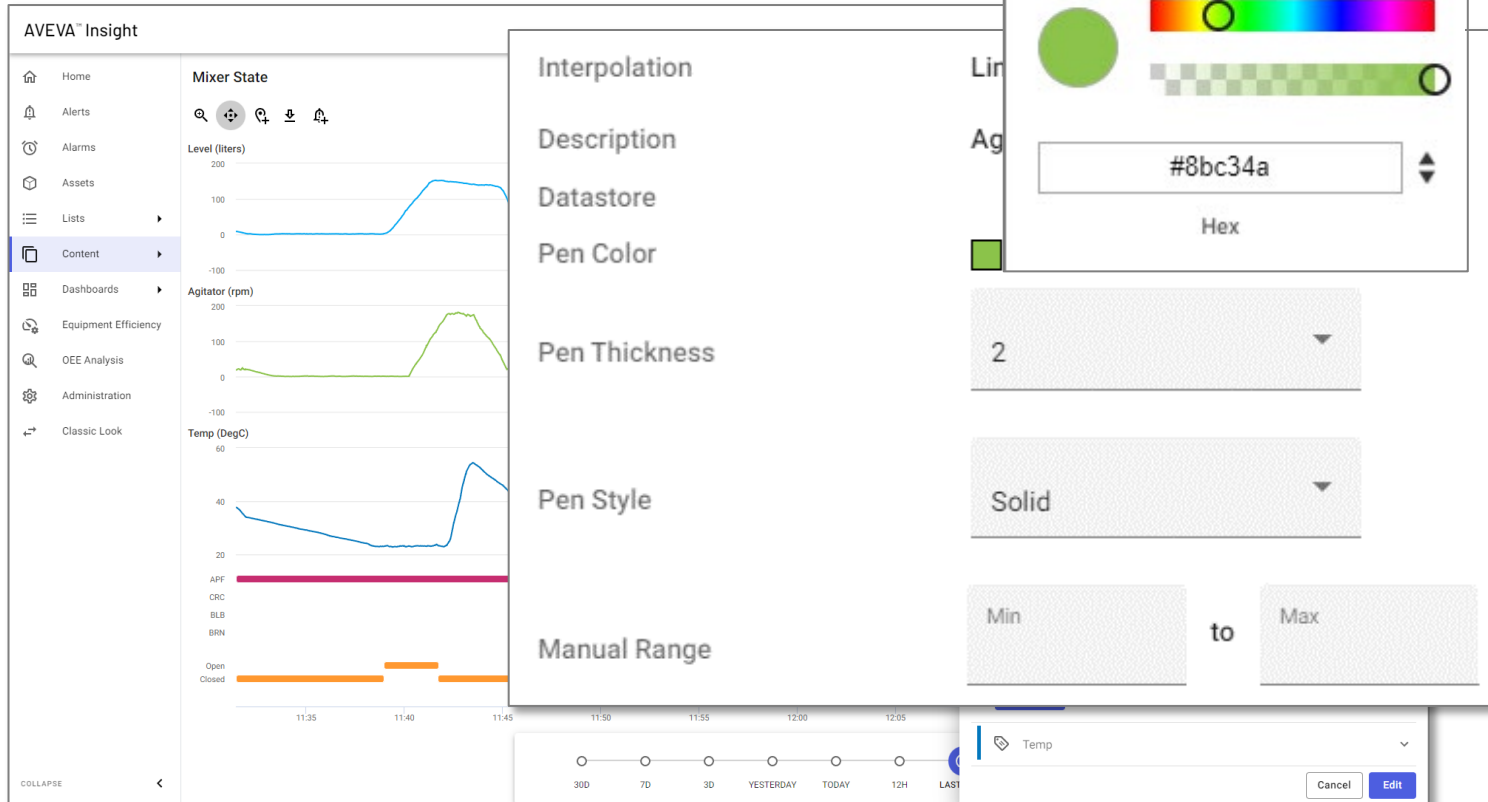
Steam



Temperature (PV)



# Line Chart: Pen Styles



- Linear/stairstep
- Thickness
- Style (solid/dashed)
- Manual range
- Color

# Selecting Chart Type

The image displays the AVEVA Insight interface with a 'Boiler Pressure Comparison' chart. A large grey arrow points from the 'Visualization' section of the 'Content Settings' panel to the 'Line Chart' option in the 'Visualization' section of the 'Content Settings' panel. The 'Content Settings' panel is shown in two overlapping states, illustrating the selection process.

**Content Settings (Top Panel)**

- Visualization
- Column Chart
- Data Grid
- Line Chart (Selected)
- Pie Chart
- Status Board

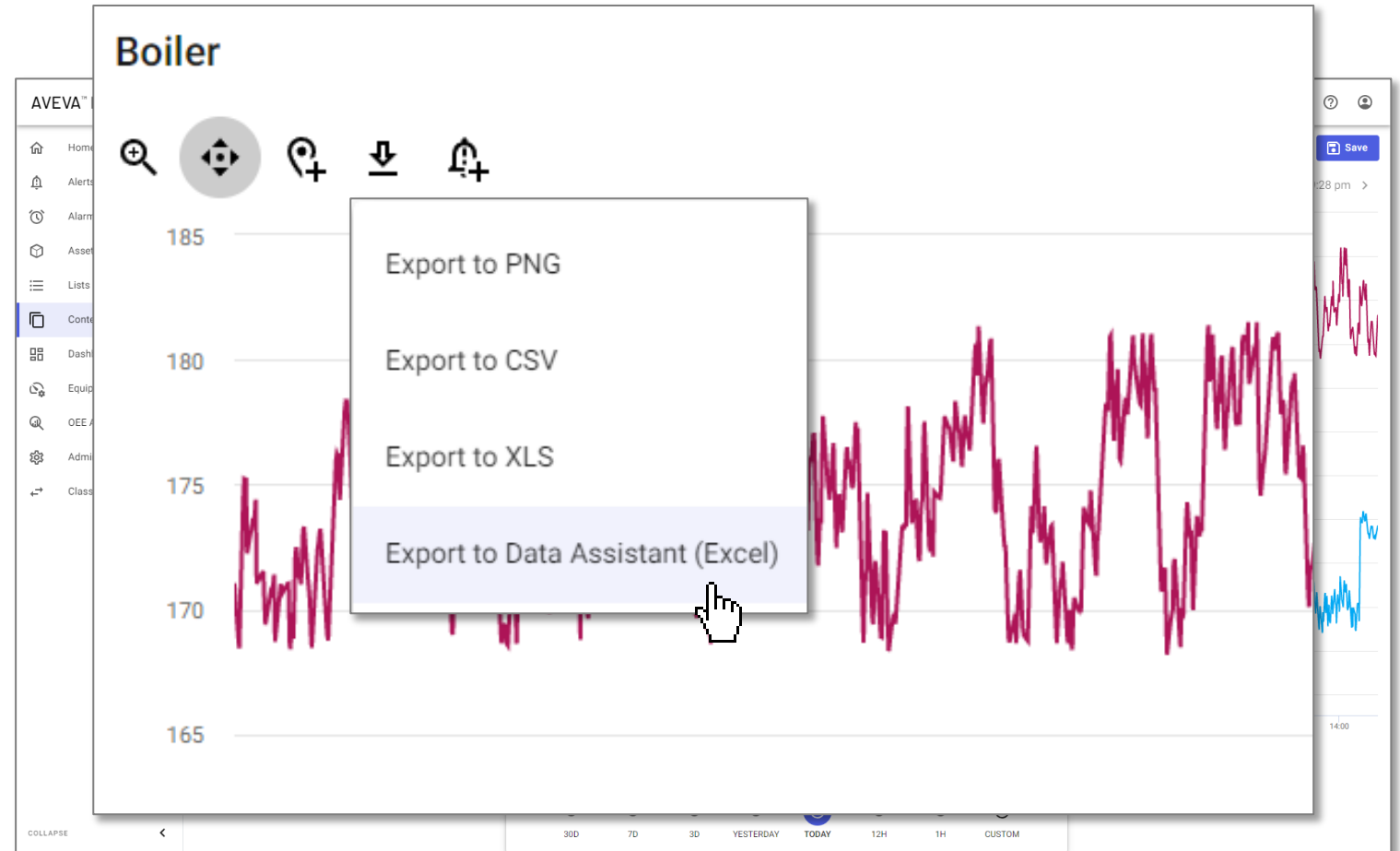
**Content Settings (Bottom Panel)**

- Content Type
  - Asset Efficiency
  - Asset Overview
  - Visualization (Selected)
  - Other
- Visualization
  - Column Chart
  - Data Grid
  - Graphic
  - Line Chart (Selected)
  - Pie Chart
  - Status Board

- Types of content growing
- Harder to remember icon
- Expanding more

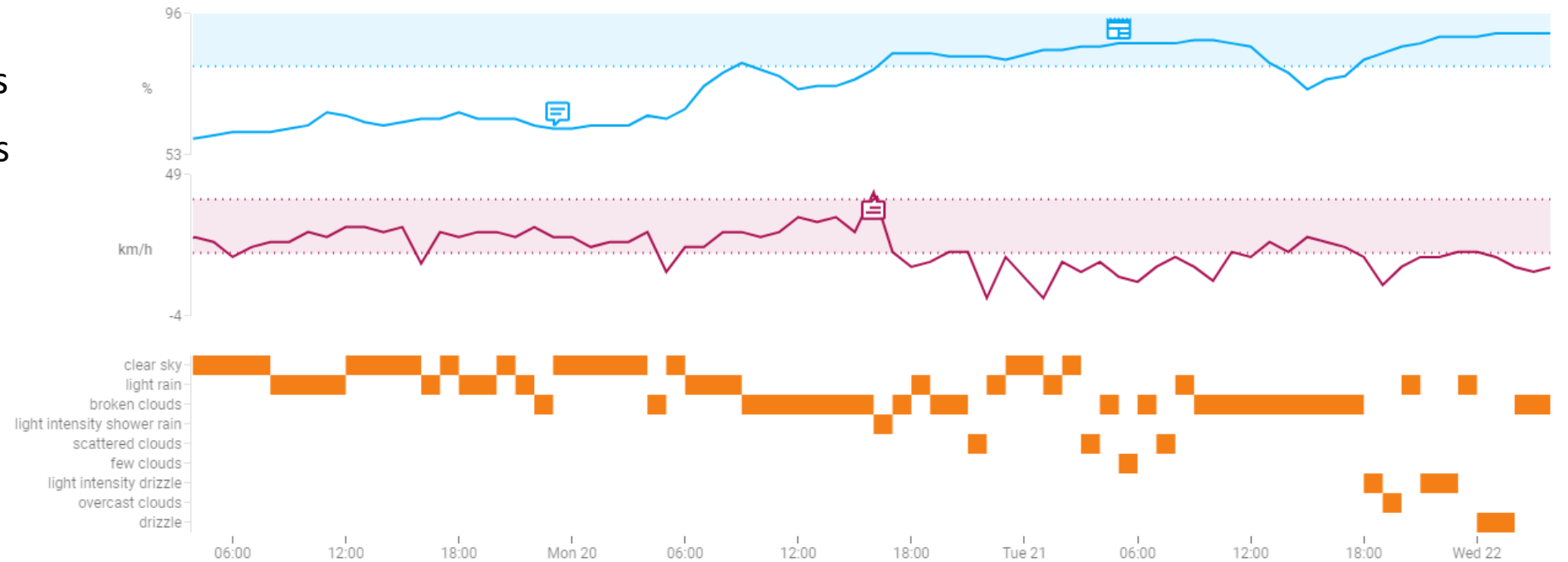
# Exporting Data

- Available from most content
- Initially, export
- Plan to adapt on-prem
  - Custom functions
  - More flexible selection
  - Event-based rollups



# Richer Line Chart

- Strings & Digitals
- Display of Tag Zones
- Add/Edit Comments
- Overlay “News”





# AVEVA Insight Highlights



New Experience



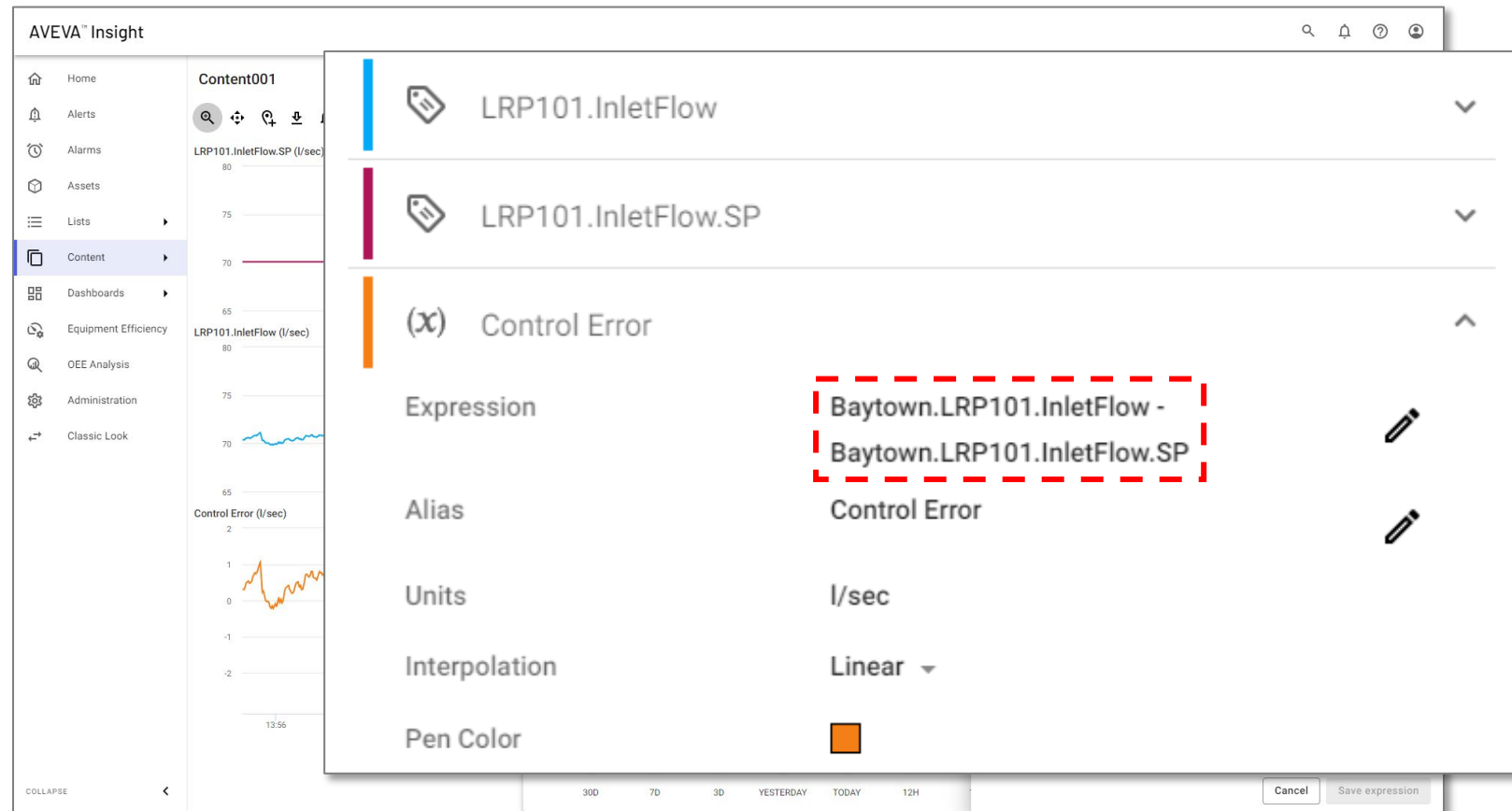
Year In Review



Expressions

# More Meaningful Metrics

- Ad hoc expressions
  - Results not stored
  - Can save with charts
- Rich function library
- Integrated engineering unit conversion
- *Only* in “New Experience”



- 🏠 Home
- 🔔 Alerts
- 🕒 Alarms
- 📦 Assets
- ☰ Lists
- 📄 Content
- 📊 Dashboards
- ⚙️ Equipment Efficiency
- 🔍 OEE Analysis
- ⚙️ Administration
- ↔️ Classic Look

Content001

🔍

📍

📌

⬇️

🔔

📍 Cursor

📄 Data

⚙️ Settings

💾 Save

< 10/21/2022 12:00:00 am - 10/21/2022 10:54:36 am >

Pressure



Temperature



Ad Hoc Expression Demo

○

○

○

○

🕒

○

○

🕒

30D

7D

3D

YESTERDAY

TODAY

12H

1H

CUSTOM

# Specific Use Cases Targeted

## Simple Engineering

- Pump efficiency
- Find process lag based on flow rate
- Compensate for a process lag

## Exception Handling

- Substitute bad/stale values
- Find last good value

## Logical Expressions

- Simple comparisons
- Time “true”

# Ad Hoc Expressions

## Arithmetic

+  
-  
/  
\*  
^  
%

## Units

UOM  
CASTUOM

## Scalar

SIGN  
ABS  
SQRT  
LOG  
ROUND  
TRUNCATE

AND  
OR  
NOT

IF  
IFBAD

## Statistics

AVERAGE  
AVERAGES  
TOTAL  
TOTALS  
MIN  
MAX

*Time Weighted* → AVERAGE  
→ AVERAGES  
→ TOTAL  
→ TOTALS

*Simple Statistical* → AVERAGES  
→ TOTALS

*New in  
AVEVA  
Insight*

{

## Time Series

TIMESHIFT  
DURATION  
PREV  
PREVGGOOD

# Unit Conversion

## Integrated Into Expressions

FI101.PV + FI202.PV  
0-35.0      0-0.58  
liters/minute      liters/second

Result will be in units of first tag:

0-70.0      liters/minute

Alternative puts burden on user to convert:

FI101.PV + FI202.PV ~~/ 60.0~~ ✗

FI101.PV + FI202.PV \* 60.0 ✓

# AVEVA Insight Highlights



New Experience



Year In Review

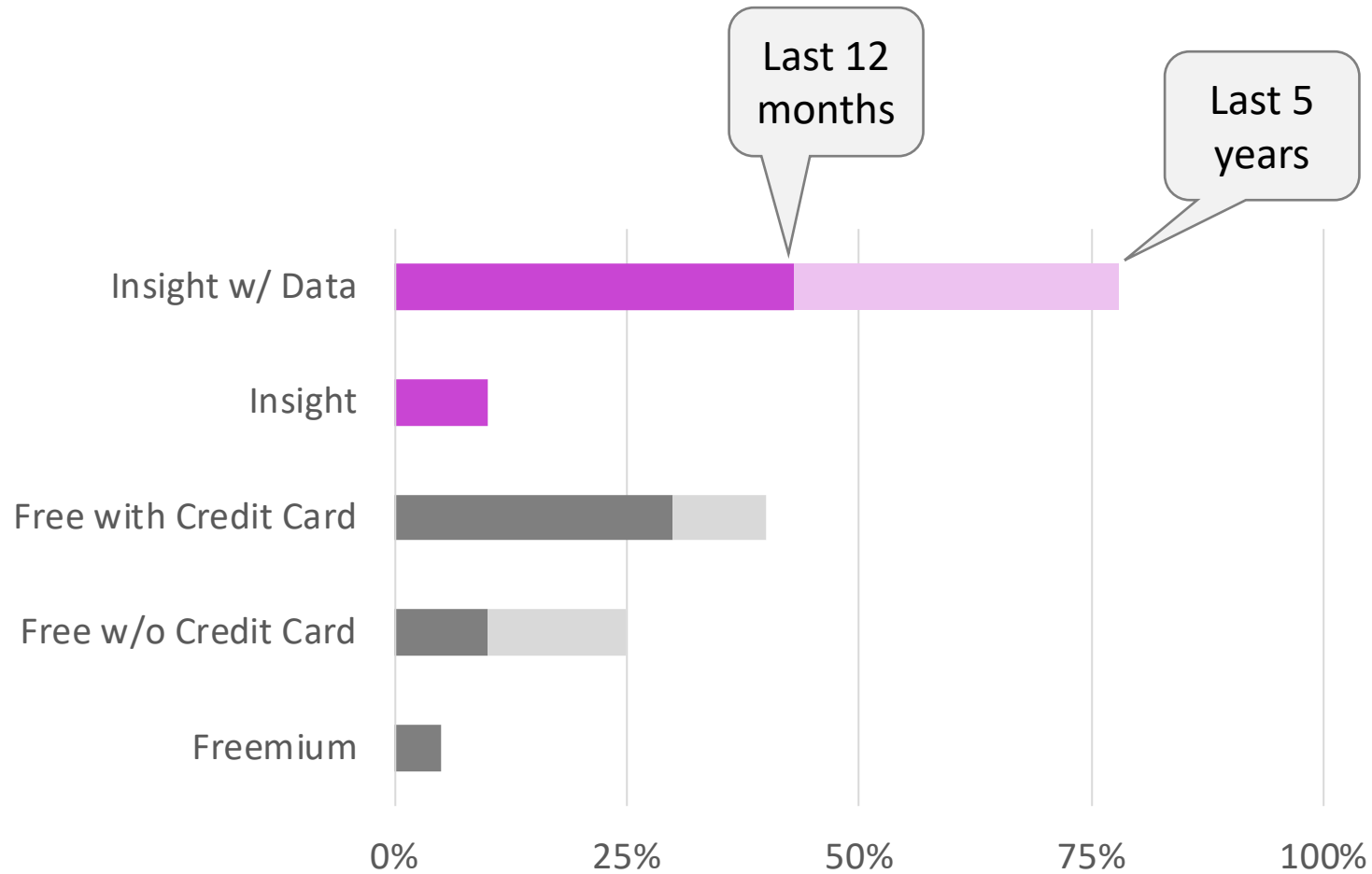


Expressions



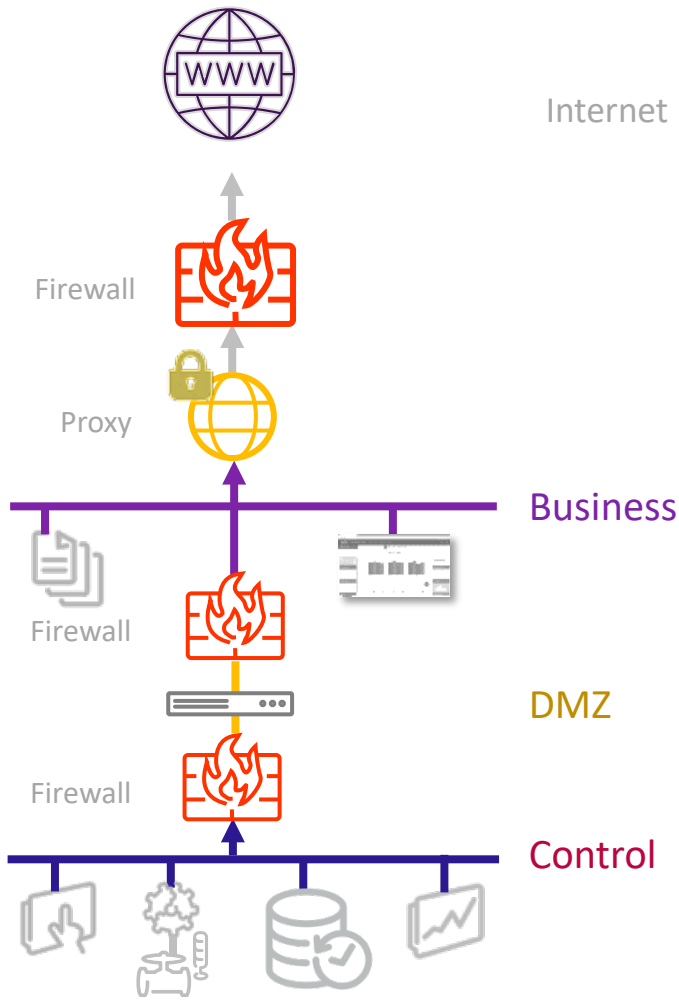
Near-Term Enhancements

# “Free” To “Paid” Conversions



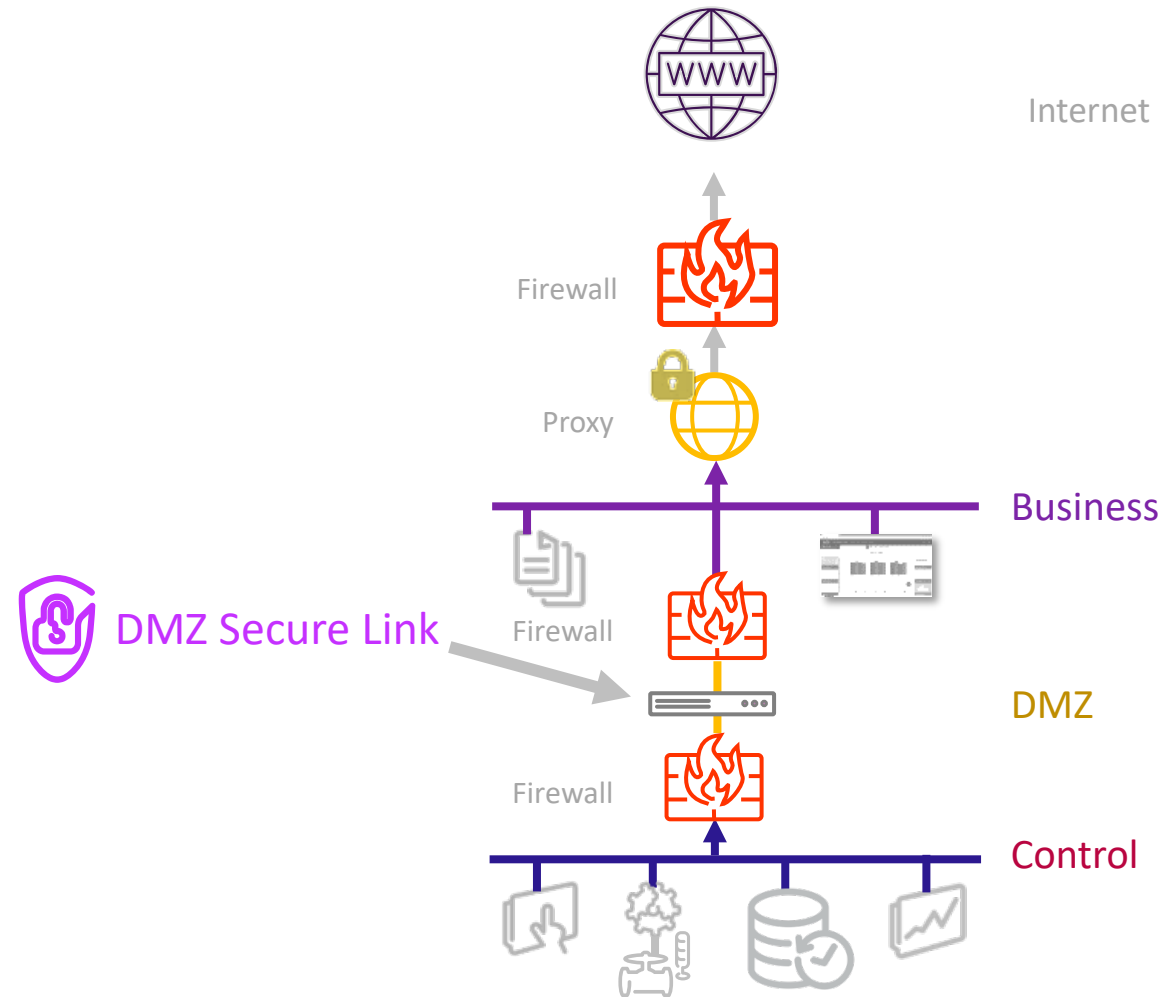


# Network Challenges



Best Practice

# Crossing The DMZ



- Enables publishing from Control Network
- Managed, application-specific web proxy
- Free download from AVEVA Insight

Best Practice

# AVEVA Insight Highlights



New Experience



Year In Review



Expressions

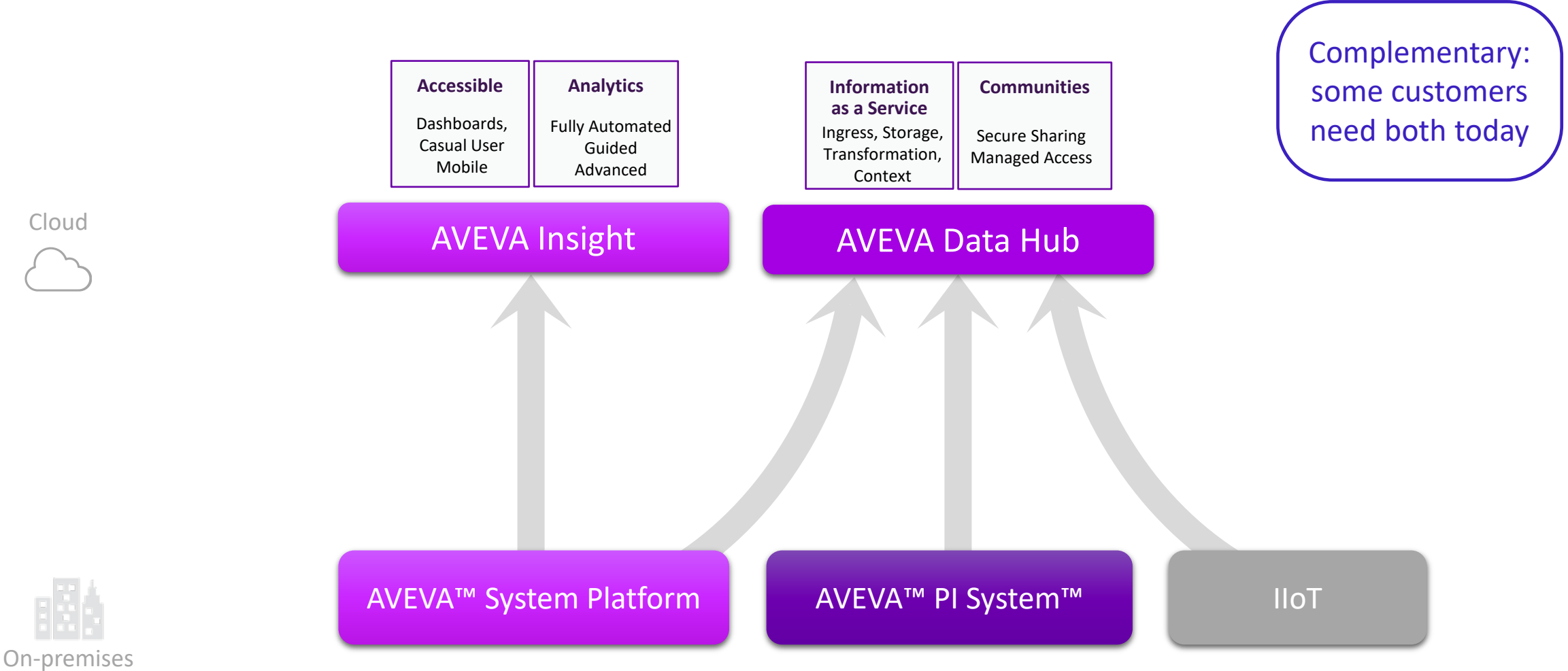


Near-Term Enhancements

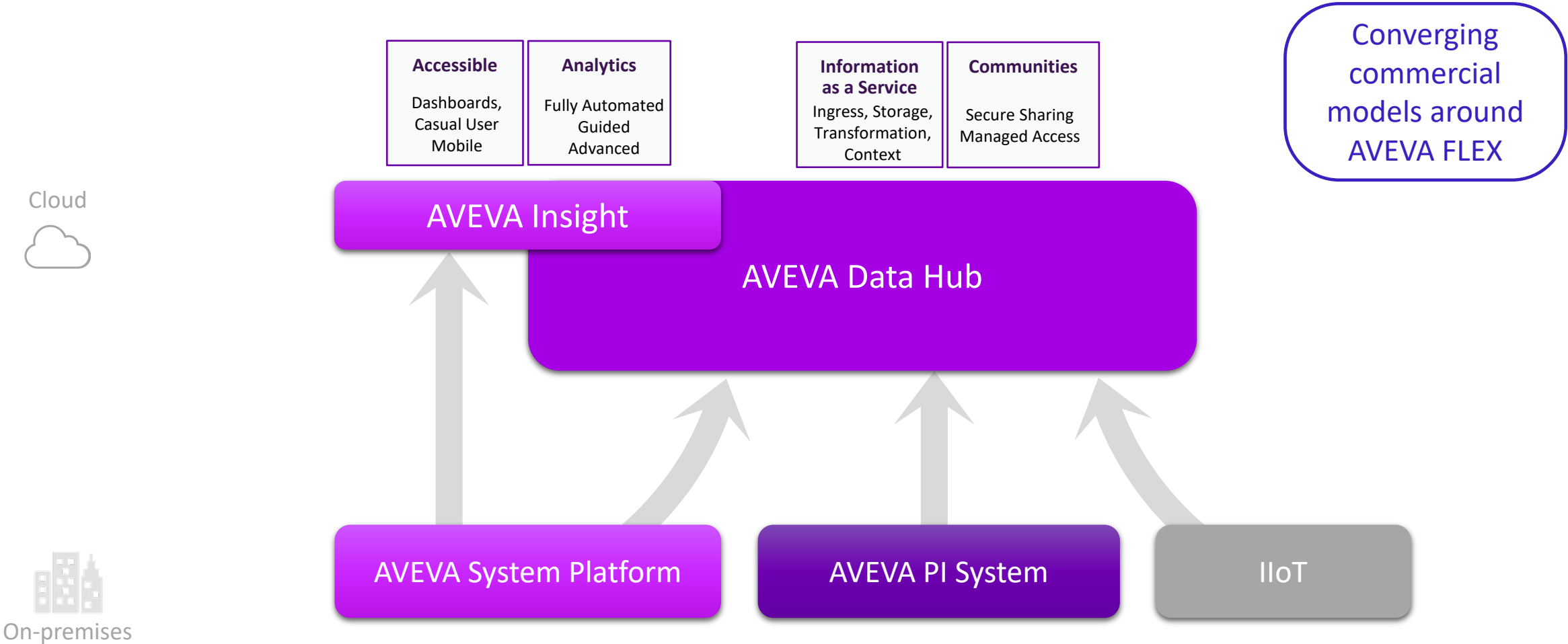


AVEVA Insight & AVEVA Data Hub

# Online Information



# Converging Online Information



# Insight Highlights



New Experience



Year In Review



Expressions



Near-Term Enhancements



AVEVA Insight & AVEVA Data Hub



Analytics

# Guided Predictive Analytics

## Predictive Analytics (aka PRiSM) algorithm with Guided experience

- Additional option in Guided Analytics:
  - Predictive Analytics for long-running assets (e.g. rotating)
  - TwinThread-based algorithm for batch-oriented assets with time-based patterns
- Predictive Analytics algorithm:
  - Returns a predicted value for each sensor → helps identifying anomaly root cause
  - Also returns an anomaly score (aka Overall Model Residual)
  - Does NOT have segmentation like the TwinThread algorithm
  - Outlier detection automatically applied to training data set

Guided Predictive Analytics Model Details

Model Name  
UF9\_Anomaly

Unique name excluding +, -, <, >, &

Asset  
/Laval/UF9

Tags  
laval uf9

Choose one or more tags to use in your model

- Laval.UF9.FlowRate
- Laval.UF9.InletPressure
- Laval.UF9.InletTemp
- Laval.UF9.OutletPressure
- Laval.UF9.OutletTemp
- Laval.UF9.PumpMotorCurrent

6 tag(s) added out of 30

Configure Filter  
Optional condition to indicate the asset or process is not running.

Filter Tag  
Laval.UF9.State

Filter Operator  
Equal

Filter Value  
Idle

User-friendly but powerful anomaly detection

Coming in  
October

# Guided Analytics

## Predictive Analytics with Guided experience

- Additional option in Guided Analytics:
  - Predictive Analytics for long-running assets (e.g. rotating)
  - Time based patterns for batch-oriented assets
- Predictive Analytics algorithm:
  - Returns a predicted value for each sensor → helps identifying anomaly root cause
  - Anomaly score (aka Overall Model Residual)
  - Outlier detection automatically applied to training data set

Guided Predictive Analytics Model Details

Model Name  
UF9\_Anomaly

Unique name excluding +, ', <, >, &

Asset  
/Laval/UF9

Tags  
laval uf9

Choose one or more tags to use in your model

Laval.UF9.FlowRate

Laval.UF9.InletPressure

Laval.UF9.InletTemp

Laval.UF9.OutletPressure

Laval.UF9.OutletTemp

Laval.UF9.PumpMotorCurrent

6 tag(s) added out of 30

Configure Filter

Optional condition to indicate the asset or process is not running.

Filter Tag  
Laval.UF9.State

Filter Operator  
Equal

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Idle

User-friendly but powerful anomaly detection

Coming in  
October



A person with a backpack stands on a rocky peak, looking out over a sprawling city at dusk. The city is illuminated with warm lights, and the sky is filled with dramatic, dark clouds. The person is seen from behind, wearing a dark shirt and light-colored pants, with a brown backpack. The city below is a dense collection of skyscrapers and buildings, with a large body of water in the center. The overall mood is contemplative and expansive.

# AVEVA Insight Advanced Analytics Update

# Insight Advanced Analytics Update



Analytics & AI in AVEVA Insight



AVEVA Insight BI Gateway



AVEVA Insight BI Gateway – Use Case



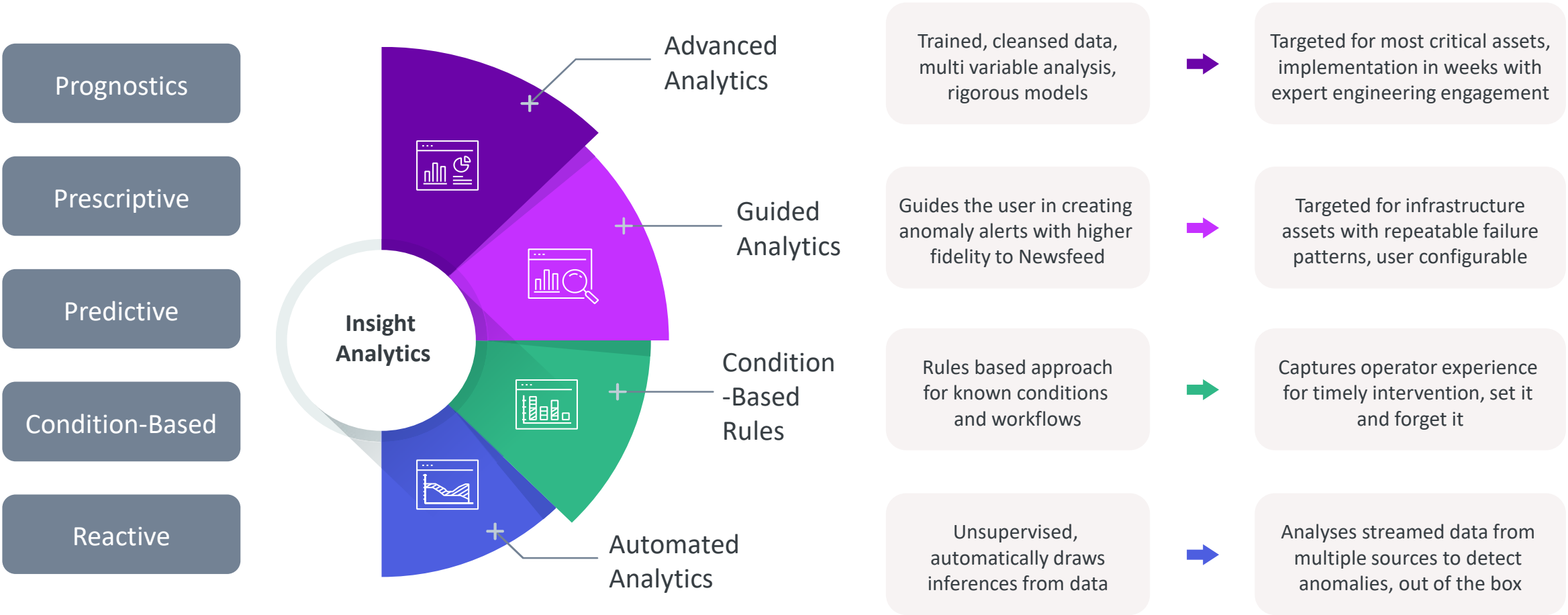
What's coming next



Energy Monitoring Solution

# Analytics & AI in AVEVA Insight

The human experience meets Artificial Intelligence in the cloud





# AVEVA Insight Advanced Analytics Update



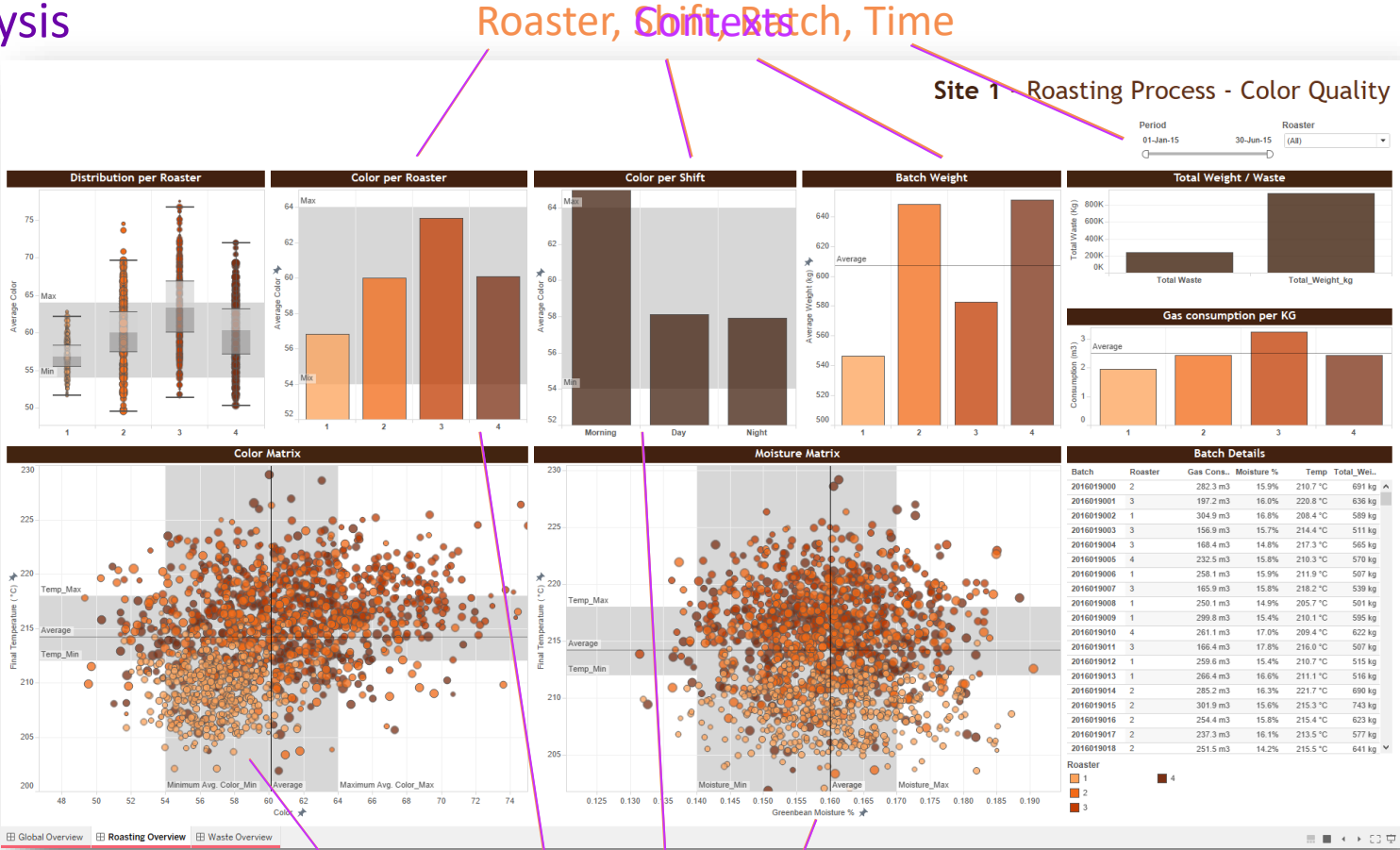
Analytics & AI in AVEVA Insight



AVEVA Insight BI Gateway

# Dashboard for connected workforce - a reverse journey

## Dashboard analysis



Contexts

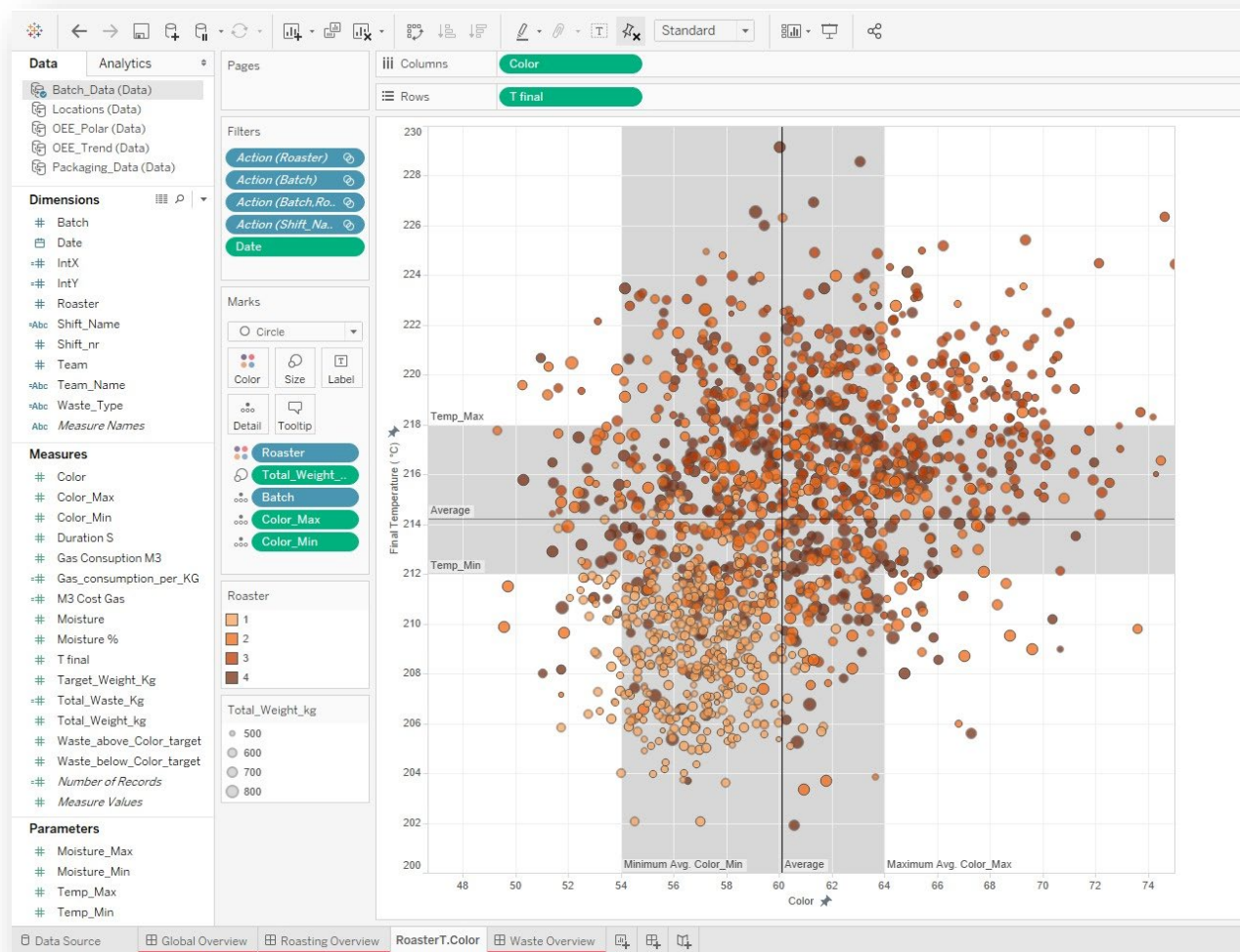
KPIs, Metrics

# Data Modeling – a reverse journey

## Dashboard design

### Dimensions

### Measures



### Data model

# Data Modeling – a reverse journey

## Model Builder

Model Builder

AVEVA™ Insight BI Gateway

**Measures** 2

- News
- Measure

**Dimensions** 13

- FQNs
- NewsAlgorithm
- Asset
- Crew
- NewsEvents
- OEECalculations
- ProductID
- Shift
- UtilizationEvent
- UtilizationReason
- UtilizationReasonGroups
- UtilizationState
- WorkOrderID

**Data Sources** 2

- Insight\_EMEA
- ProductionPlanning

**General** | Context

Name: News

Description: Intelligence Measure Object

**Refresh Rate**

Interval: 1 Unit: Hour

Offset (minutes): 0

**Update Period**

Interval: 2 Unit: Hour

☒ **Measure Period**

Interval: 1 Unit: Hour

**Data Backfill**

Data collection start: 04/01/2022 02:00 AM

☐ Override SQL Server default file group

[Edit Calculations](#)

# AVEVA Insight Advanced Analytics Update



Analytics & AI in AVEVA Insight



AVEVA Insight BI Gateway



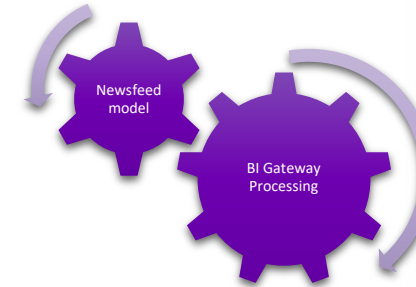
AVEVA Insight BI Gateway – Use Cases



# Newsfeed - Extended Experience

## AVEVA Insight BI Gateway

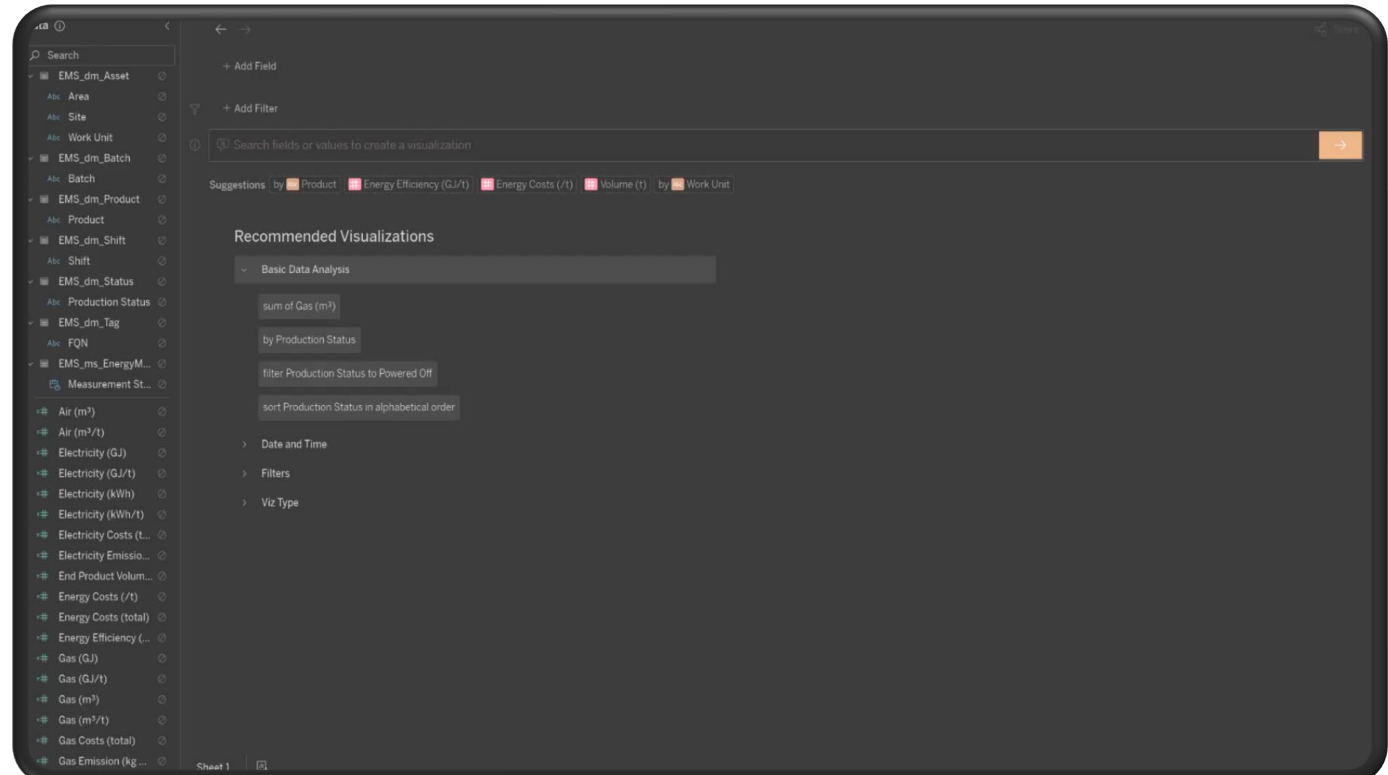
- Consume Insight anomaly detection
- Aggregate detection and score by algorithm
  - Automated Analytics
  - Guided Analytics
  - Advanced Analytics
- Contextualize with operational data
  - Asset, state, shift, workorder, product, etc.
- Quickly identify
  - Site having most anomalies
  - Model most frequently deviating
  - Asset and Tagnames most contributing to site's situation
  - Drill-down to Insight data by observation period



# Data at your fingertips

## Simplifying analytics with natural language

- Query data using natural language
  - Ask Data (Tableau) - Q&A Microsoft Power BI
  - Self-service analytics
- Powerful analytics that:
  - Interprets intent behind ambiguous question
  - Refine question at any time
  - Answer and visualize data at best
  - Make better data-driven decisions
- Save and share your analytics with your community



Why showcasing those third-party advanced feature?

...its effectiveness is based on a solid, structured, curated and responsive data model provided by **Insight BI Gateway**

# AVEVA Insight Advanced Analytics Update



Analytics & AI in AVEVA Insight



AVEVA Insight BI Gateway



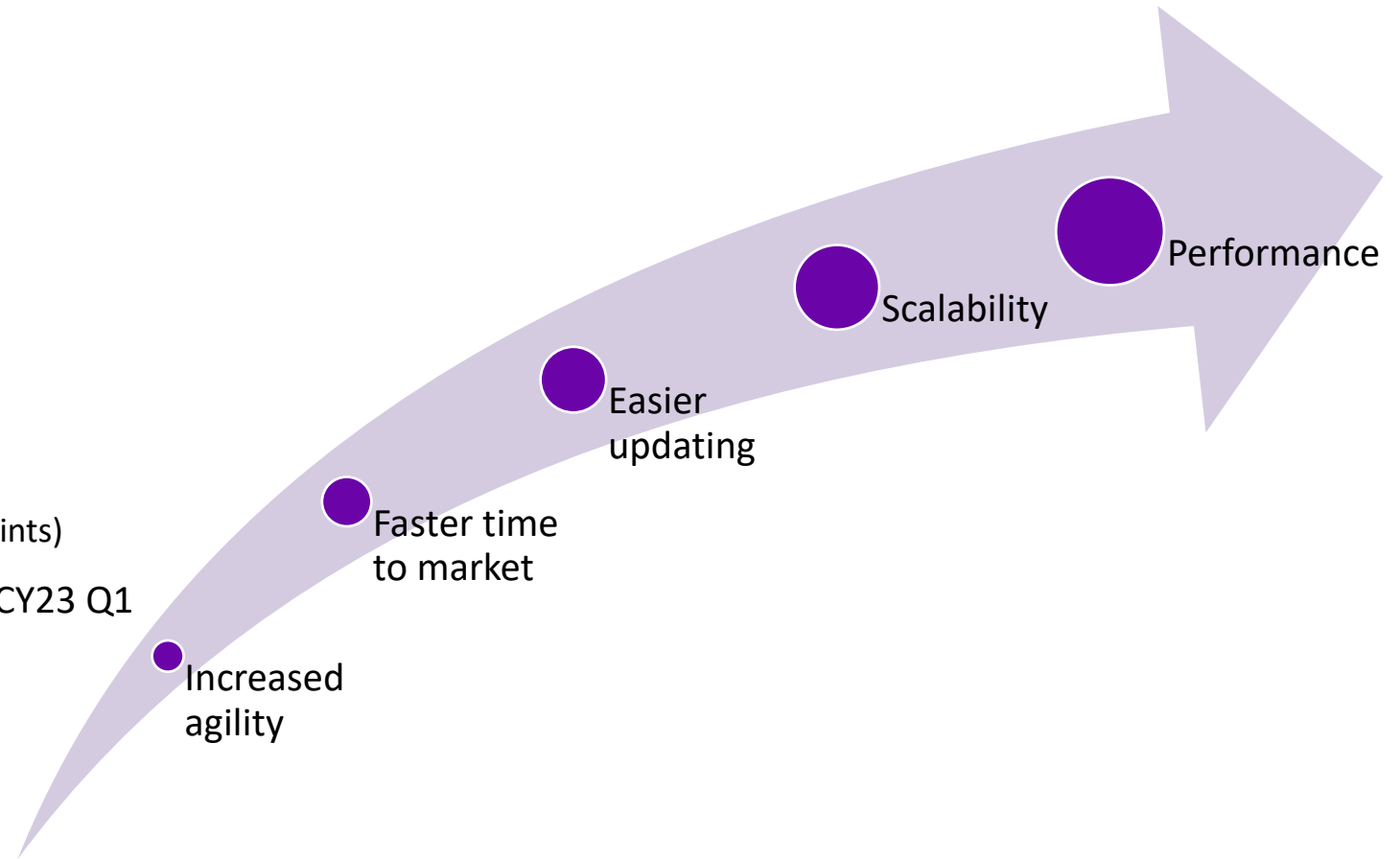
AVEVA Insight BI Gateway – Use Case



What's coming next

# What's coming next

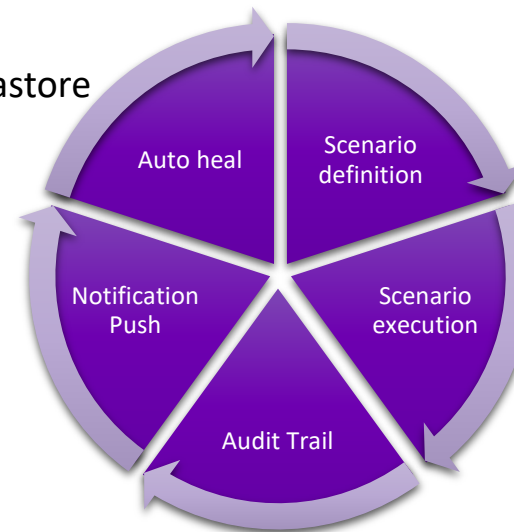
- Next Gen
  - Azure Microservices architecture – CY23 Q2
  - UI/UX modernization – CY23 H2
- Data Adapters
  - Insight Data Adapter enhancement - CY23 Q1
    - Support of new Insigth Asset Model
    - Advanced retrieval mode (Historian and MES endpoints)
  - Generic REST API Data Adapter enhancement - CY23 Q1
    - Support of AVEVA Data Hub authentication
    - Support of new Insigth Asset Model
- Data Monitoring Service - CY23 Q1



# Dealing with real world problem...

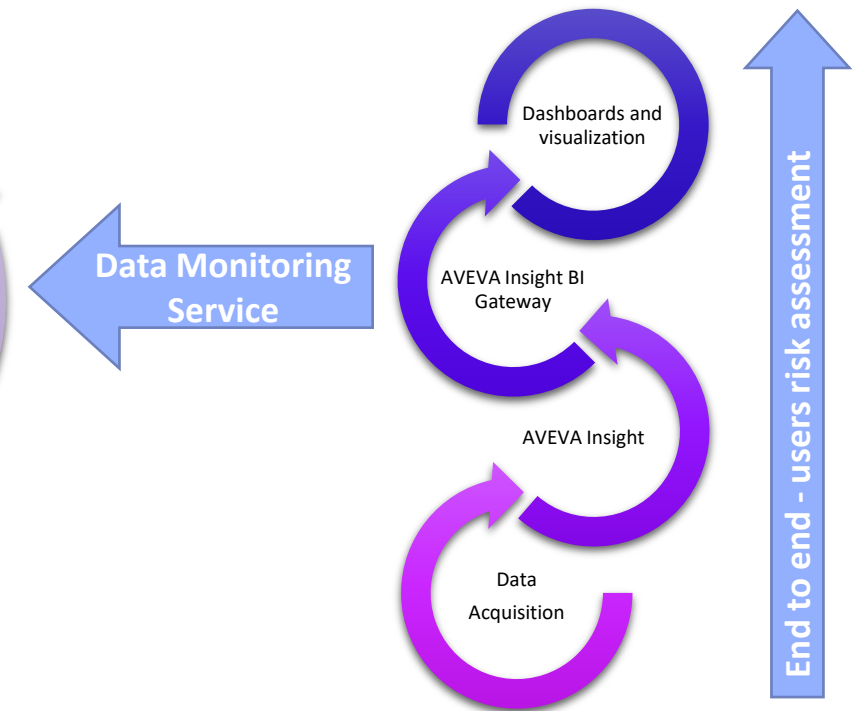
## Data Monitoring Service

- #1 – Voice of Customer requirement
- Goals:
  - Sustain user's end-to-end risk assessment initiative
  - Ensure about solid data consistency within the datastore
  - Improve qualification logic of uncertain data
- Scenario definition:
  - Data Reliability
    - Data loss, late, burst
  - Data Validity
    - Anomaly Detection – AI
  - Processing Performance
    - Regular refresh, backfill, on-demand
  - System Health
    - Health index



### Risk types:

- Configuration error, change control management
- OnPrem syst shutdown, in maintenance
- LAN/WAN network outage
- Scada communication layers down
- Etc.



# AVEVA Insight Advanced Analytics Update



Analytics & AI in AVEVA Insight



AVEVA Insight BI Gateway



AVEVA Insight BI Gateway – Use Cases



What's coming next

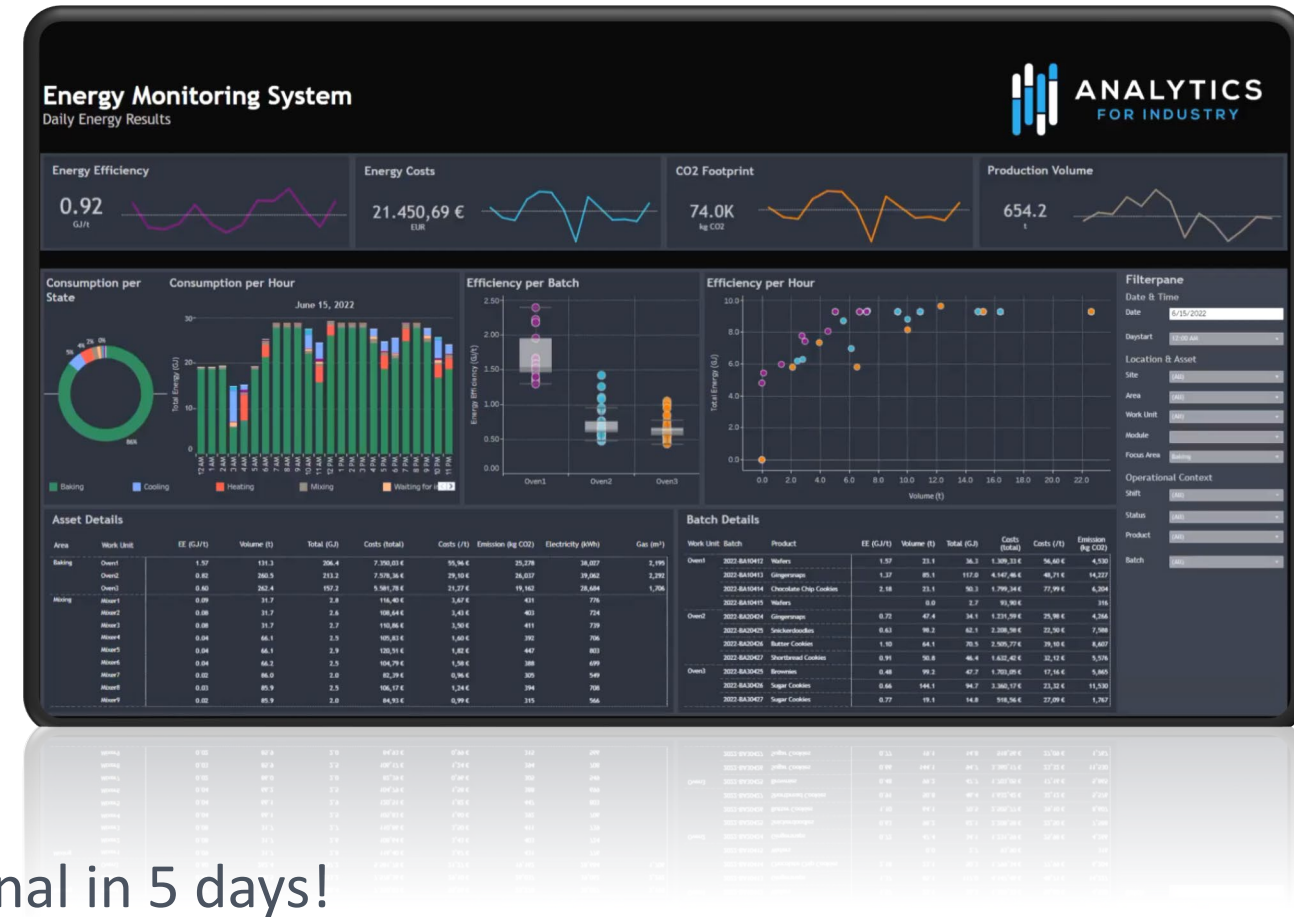


Energy Monitoring Solution

# Energy Monitoring System for Manufacturing

## Powered by Analytics for Industry

- Monitor energy
  - Consumed/Produced/Transferred/Supplied
- Compute KPIs
  - Energy Efficiency, CO2 footprint, Cost
- Support Energy normalization (GJ/kWh)
- Contextualized with your operational data
  - Asset, Shift, Crew, Product, Work Order, Production Declaration
- Leverage AVEVA Cloud Platform
  - AVEVA Insight – Predefined/Fixed data structure
  - AVEVA Insight BI Gateway - Predefined/Fixed data structure
- Library of Visualization – Predefined (Tableau/Power BI)
- Solution based on a decade of experience
- ...Just feed AVEVA Insight with your plant data



Operational in 5 days!





## Elliott Middleton

Director of Product Management – Information

- AVEVA
- [elliott.middleton@aveva.com](mailto:elliott.middleton@aveva.com)



## Damien Rouge

Technical Product Manager – Predictive Analytics

- AVEVA
- [damien.rouge@aveva.com](mailto:damien.rouge@aveva.com)



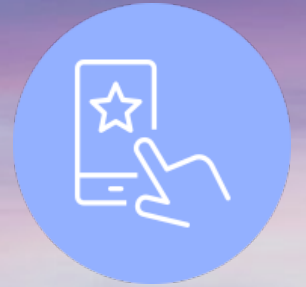
# Questions?

Please wait for the microphone.  
State your name and company.



# Please remember to...

Navigate to this session in the mobile  
app to complete the survey.




# Thank you!

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AVEVA is a global leader in industrial software, sparking ingenuity to drive responsible use of the world's resources. The company's secure industrial cloud platform and applications enable businesses to harness the power of their information and improve collaboration with customers, suppliers and partners.

Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. With operations around the globe, we are headquartered in Cambridge, UK and listed on the London Stock Exchange's FTSE 100.

Learn more at [www.aveva.com](https://www.aveva.com)