AVEVAWORLD
PARIS

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OCTOBER 2024

AVEVA MES - Advanced insights and guidance, optimized with AI

Jean-Pierre (JP) Caron – PM Model Driven MES, Advanced Planning & Scheduling, MES Connect Visualization

Jean-pierre.caron@aveva.com

AVEVA

AVEVA WORLD 2024

Agenda

Artificial Intelligence in manufacturing operations context

Introduction to CONNECT, our industrial intelligence platform & AVEVA's hybrid MES solution background

Industrial Assistant – Generative AI

Advanced Analytics

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Industry & market pressures

$3.7 T

Industry 4.0 for operations

The value created by the potential of manufacturers and suppliers implementing Industry 4.0 in their operations is estimated at 3.7 trillion USD in 2025.[1]

~300%

Investments in digital twin

The application of digital twin technology is to play a pivotal role in future urban planning, construction and operations as it is expected to save the sector some $280bn by 2030.[2]

75%

Digital improvement potential

75% of surveyed companies remain at the level of individual use cases and have not been able to impact at scale from their digital program.[3]

82%

Asset performance optimization

82% of asset failures are Random.[4]

Sources: 1. McKinsey 2. Investment Monitor 3. BCG 4. Processing Magazine

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Introduction

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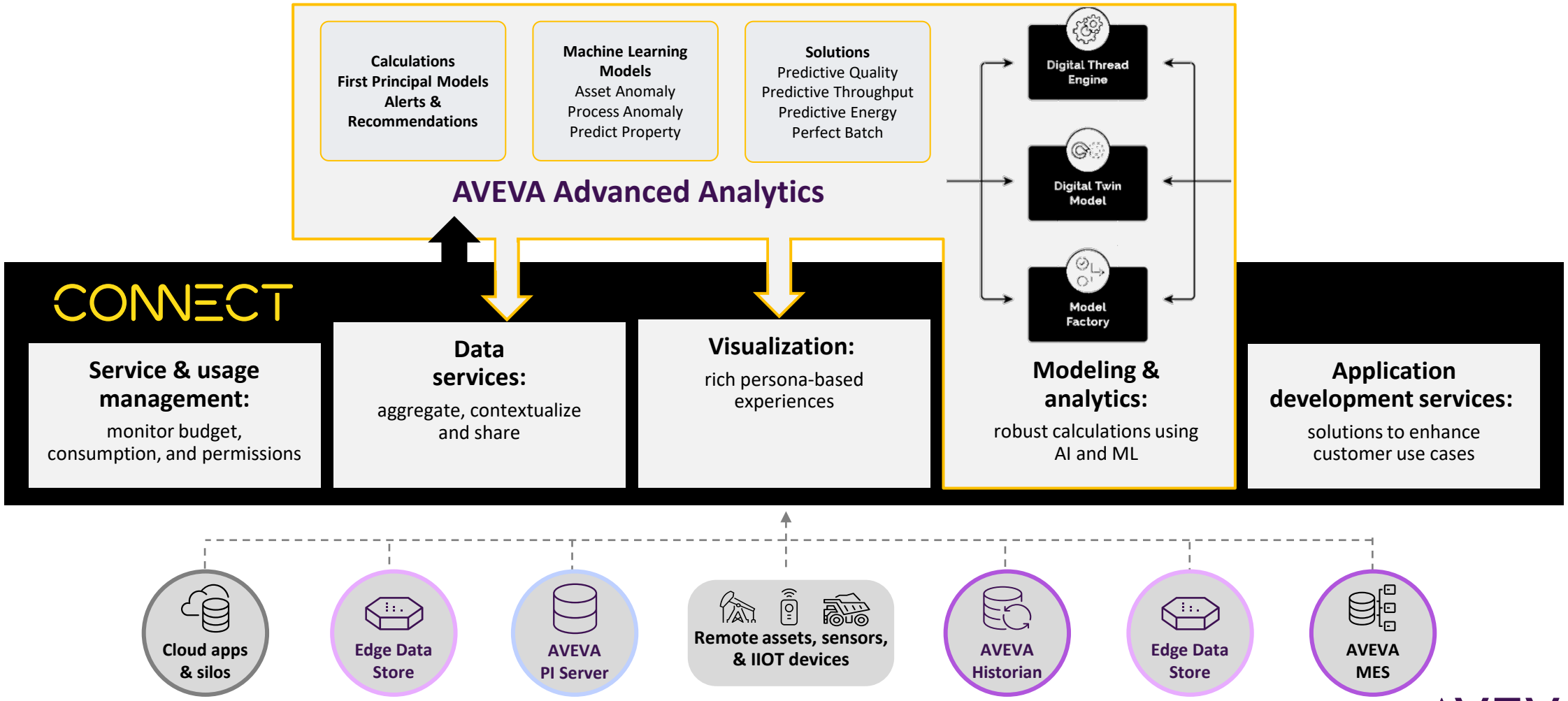
Connect AI with all industrial data and visualization

Open and neutral, providing rich data insights for your unified industrial ecosystem



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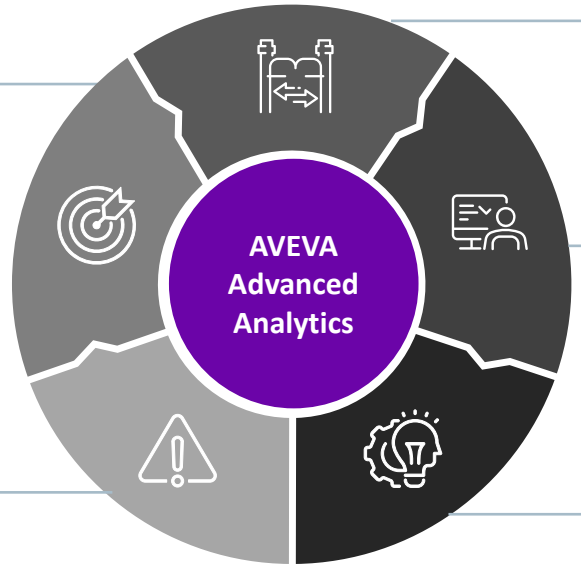
AVEVA Advanced Analytics

Transform operational data into actionable insights with a no-code, AI solution

Consolidate learnings and automate processes to operationalize outcomes and drive efficiency

Give early warnings of performance issues with improvement suggestions



Extend and enhance your digital twins from CONNECT

Leverage pre-built templates for most common industrial use cases in process and asset optimization

Transform data through analytics – from basic math and logic processing to machine learning and AI

Accelerate initiatives to create industrial intelligence with CONNECT

- Start small and prove initial value quickly
- Scale across the enterprise
- Empower all users – from engineers to data scientists – to collaborate on industrial AI applications

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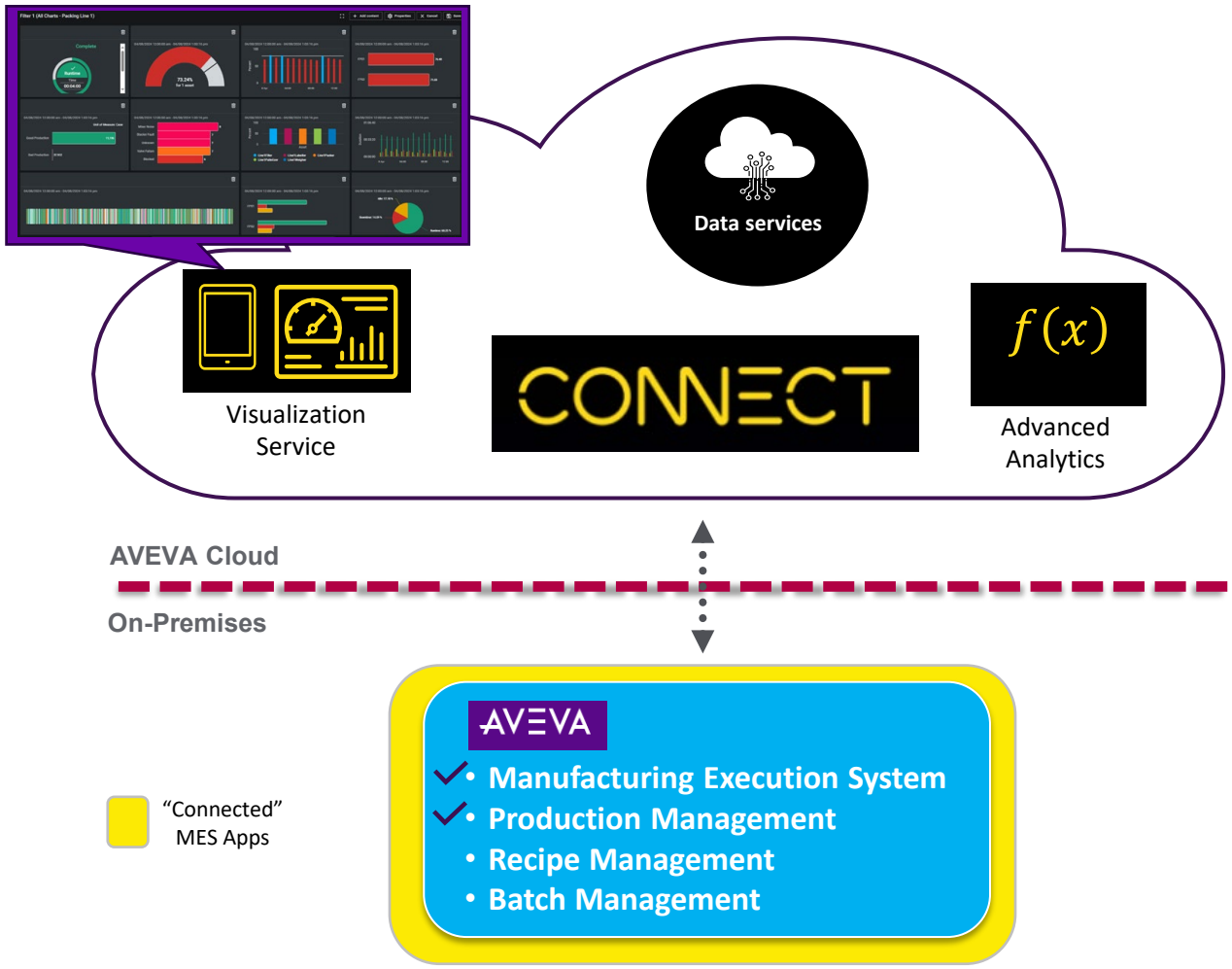
Hybrid Cloud MES solution architecture



Real-time Execution Capabilities

Connected plant applications that provide integration with CONNECT, the cloud platform.

Value-Add Cloud Apps & Services…

Cloud-based apps & services extending our on-premise (edge) based manufacturing operations capabilities with:

- **Data Services** - enterprise data historization & sharing
- **Visualization Services** - enterprise visualization & dashboarding
- **Advanced Analytics/AI** - predictive & prescriptive analytics

Commercial hybrid cloud MES offerings…

Transition all our MES products to hybrid cloud MES solutions:

- AVEVA Manufacturing Execution System – hybrid
- Production Management - Hybrid

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Industrial AI assistant

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Industrial AI Assistant on CONNECT

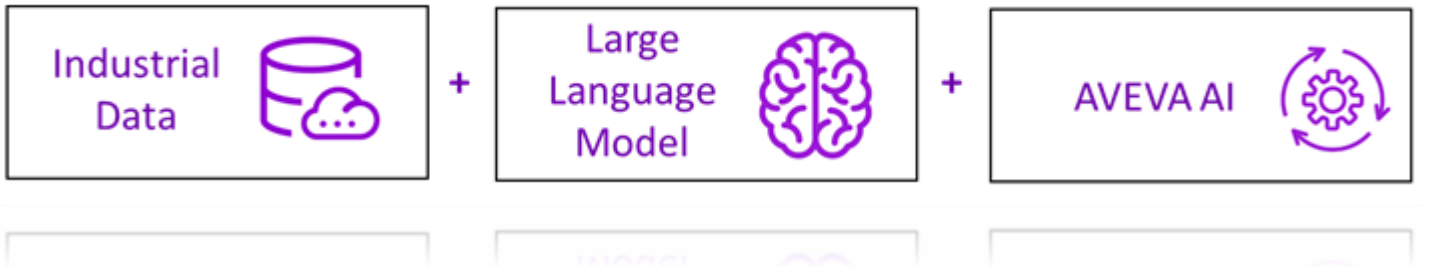
…partnered with Microsoft | AVEVA AI infused | Patent-pending

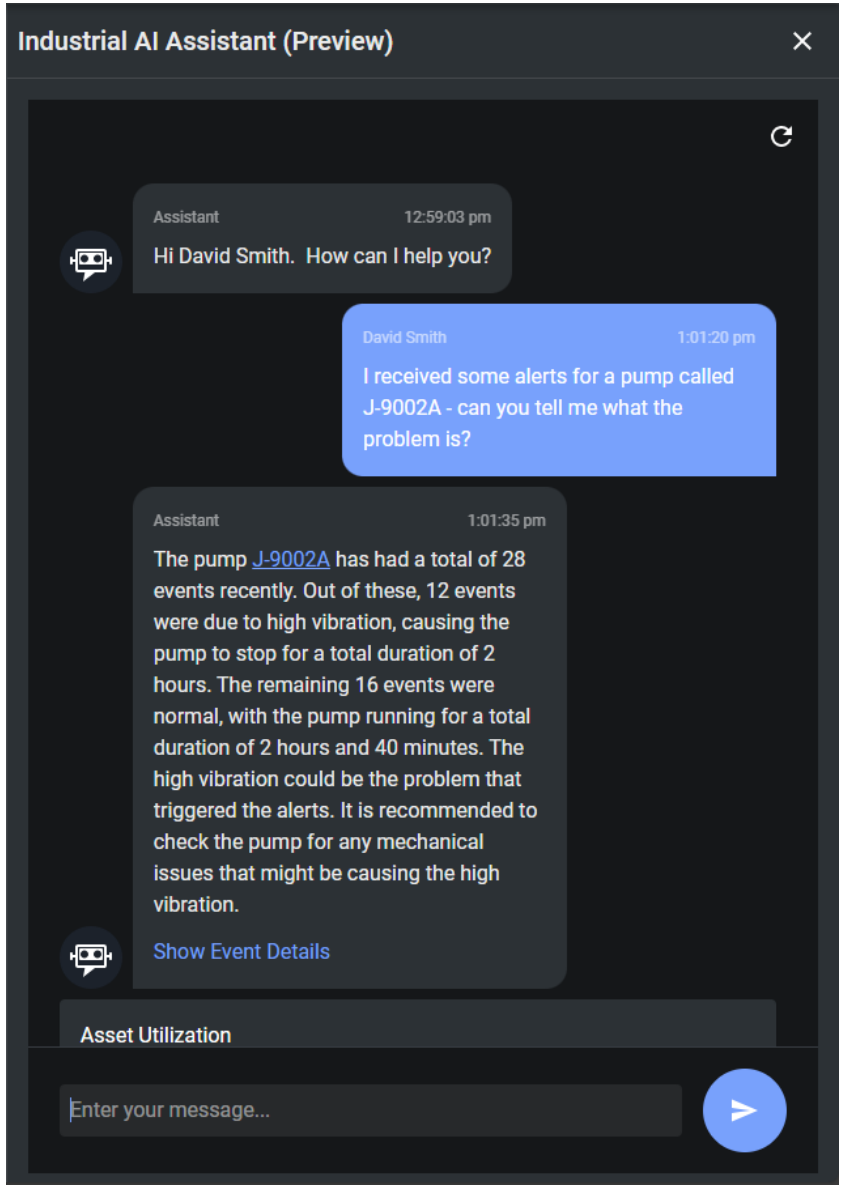
Knowledge-Linking

- AI-driven data inferencing
- Automatic relationships across structured and unstructured data
- No data hierarchy or model needed
- Fast on-boarding

Objective-Driven

- Ask complicated questions (“why is my compressor operating worse now than it did last week?”)
- Breaks down the question into sub-queries behind the scenes, using focused guardrails
- Consolidates the response back to the user
- Transparent & traceable through Citations





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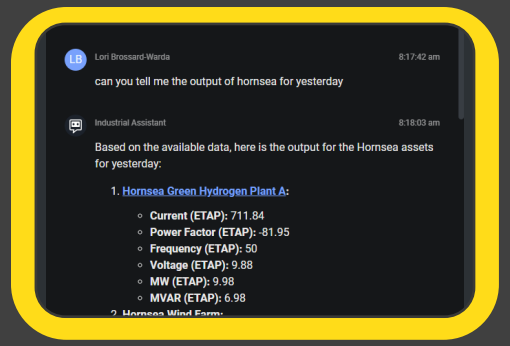
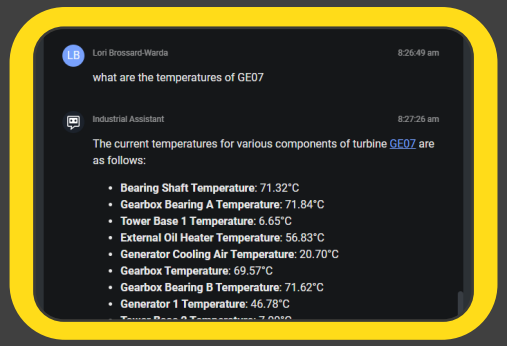
Industrial AI Assistant Key Features

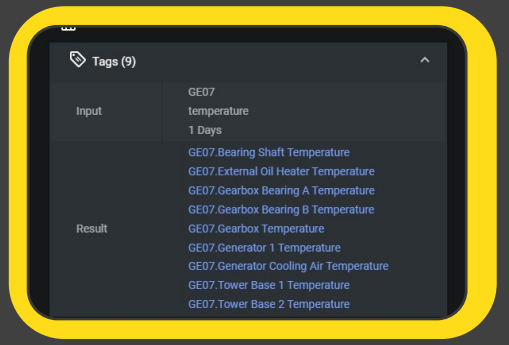
Secure access to your information using CONNECT



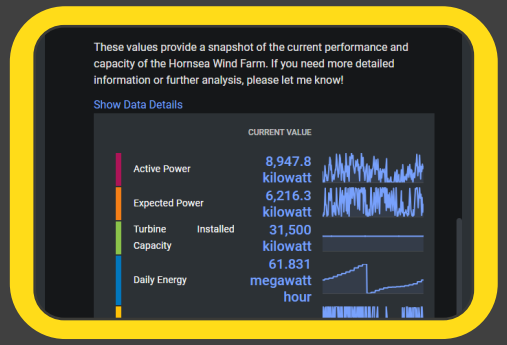
Natural Language Interface



Content Search and Summarization



Citations to show our work (Transparency and Traceability)



Generate charts inline Stream & events

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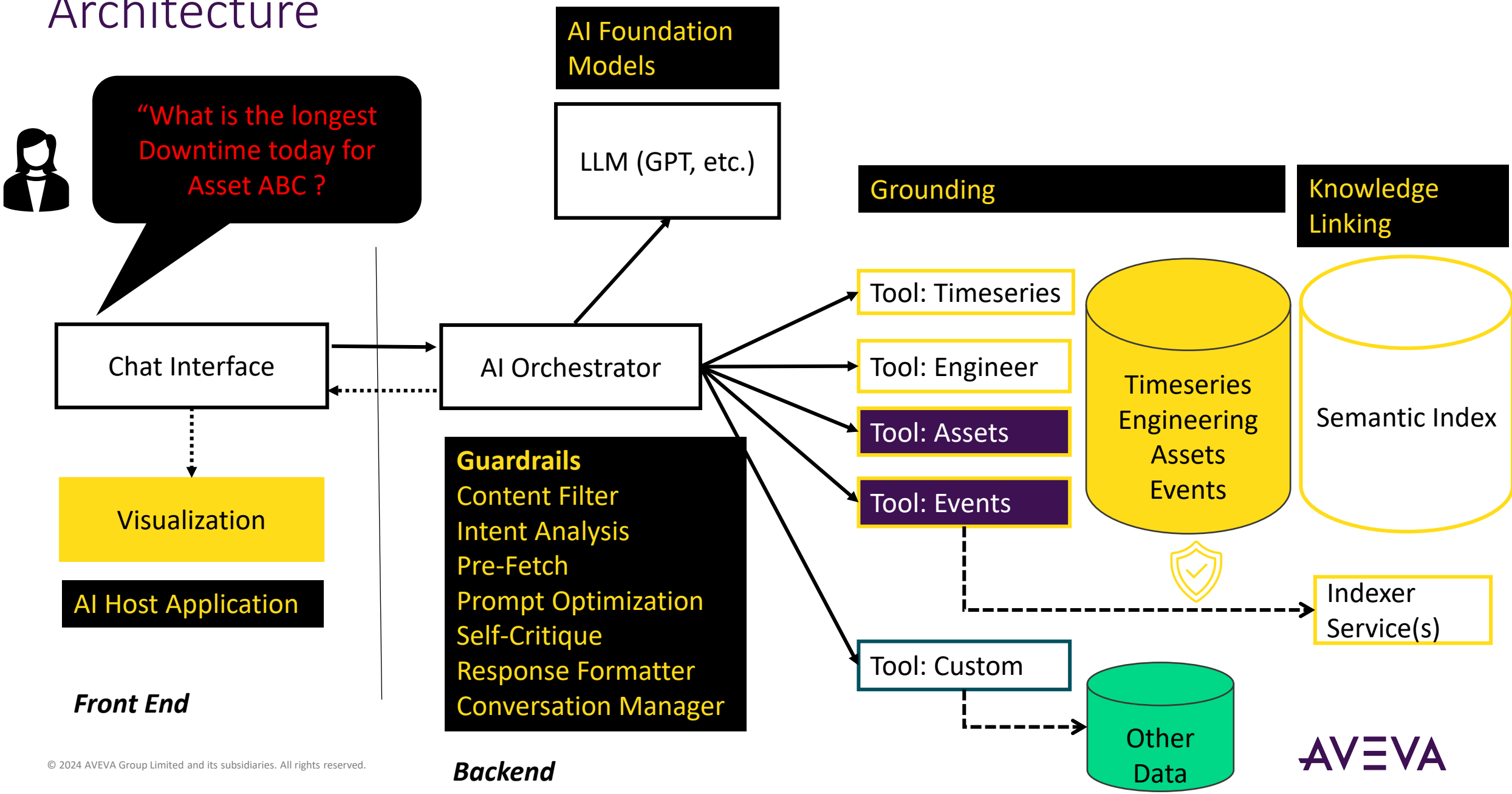
Architecture



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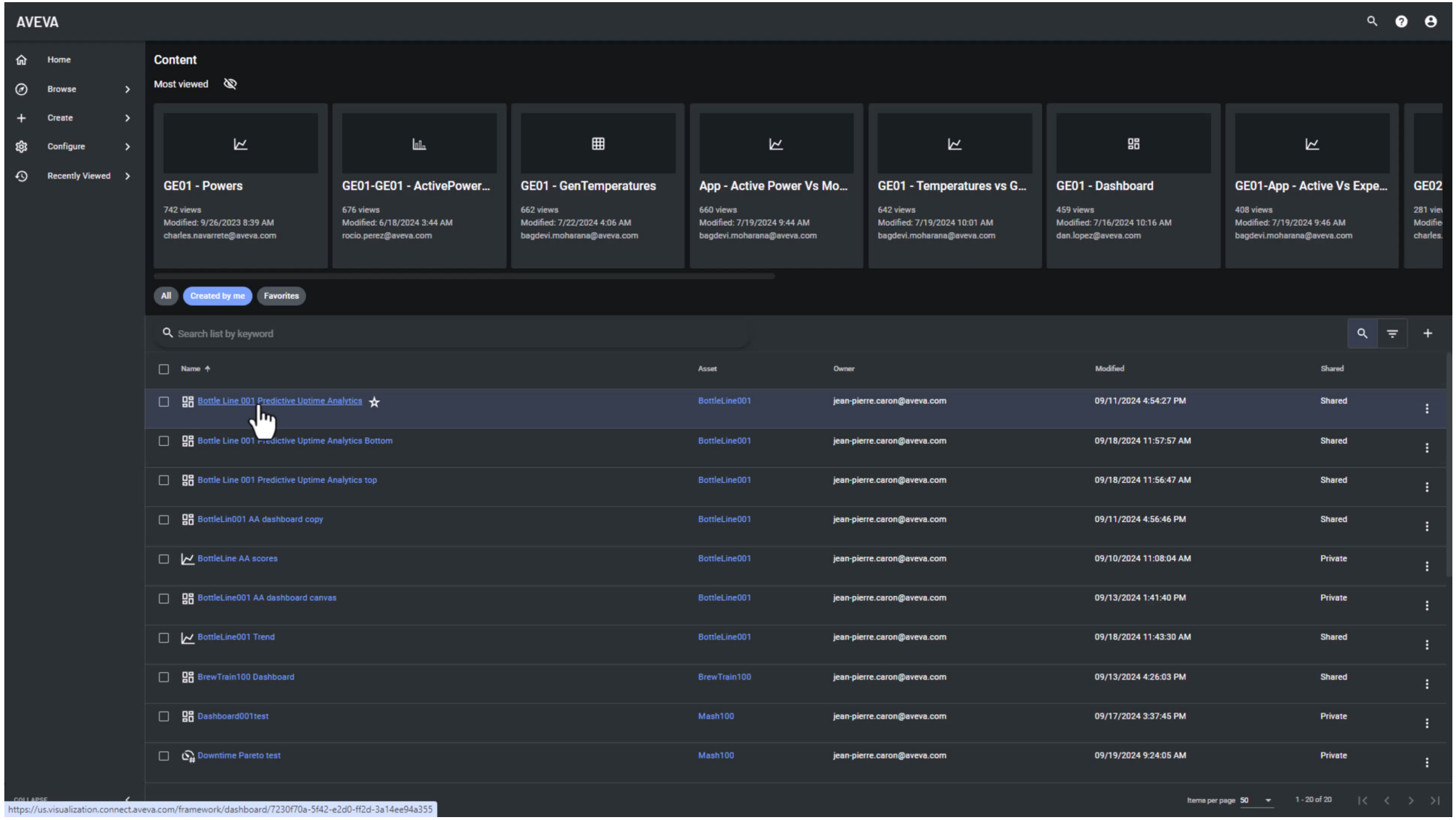
Industrial AI Assistant for MES



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Bottle Line 001 Predictive Uptime Analytics top	BottleLine001	jean-pierre.caron@aveva.com	09/18/2024 11:56:47 AM	Shared
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COLLAPSE

Items per page 50 | 1 - 20 of 20

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https://us.visualization.connect.aveva.com/framework/dashboard/7230f70a-5f42-e2d0-ff2d-3a14ee94a355

Advanced Analytics

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MES use cases with Advanced Analytics

Perfect Quality

Use cases:
- Reduce frequency of quality measurements
- Offline measurement with delayed lab results
- Get an early indication of quality in production line

Solution outcomes:
- Predicted Quality value
- Ideal operating conditions
- Anomaly timeline and breakdown
- Recommendations on controllable parameters

Throughput Optimization

Use cases:
- Identify optimum operating conditions to maximize production
- Identify measures of production by product or rate

Solution outcomes:
- Predicted production rate
- Ideal operating conditions
- Anomaly timeline and breakdown
- Recommendations on controllable parameters

Perfect Energy

Use cases:
- There is no overall measure of energy consumption
- Normalized measures of energy use by product
- Identify optimum operating conditions to minimize energy consumption

Solution outcomes:
- Normalized energy use
- Predicted total energy consumption
- Ideal operating conditions
- Anomaly timeline and breakdown
- Recommendations on controllable parameters

Additional Solutions

Perfect Production
Automate investigations and understanding of performance drivers with ML

Perfect Batch
Continuously evaluate batch performance and automate actions

Uptime Optimization
Real-time alerts and recommendations to avoid downtime events

Asset Reliability
Predict and prevent common failure modes at scale

Asset Life
Maximize serviceable life and proactively manage failure risks at scale

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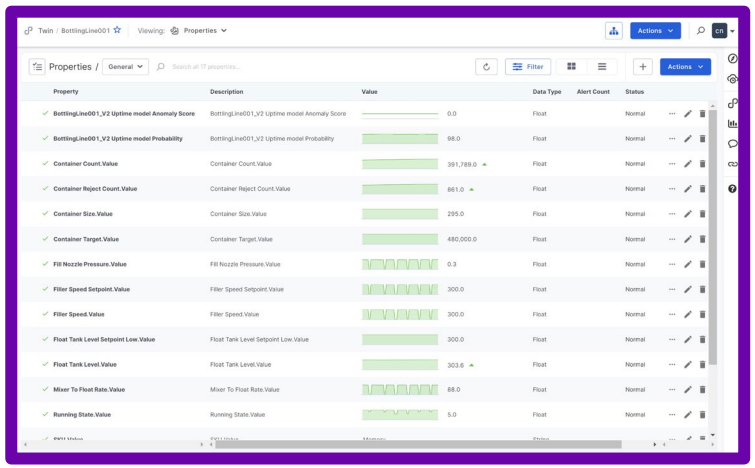
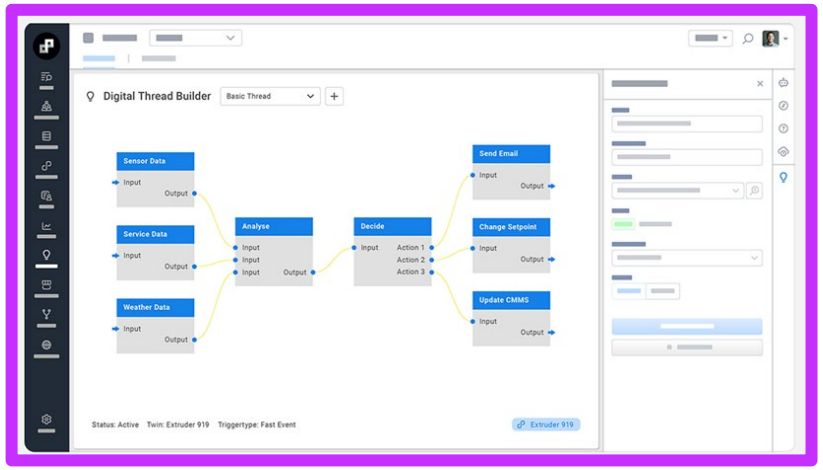
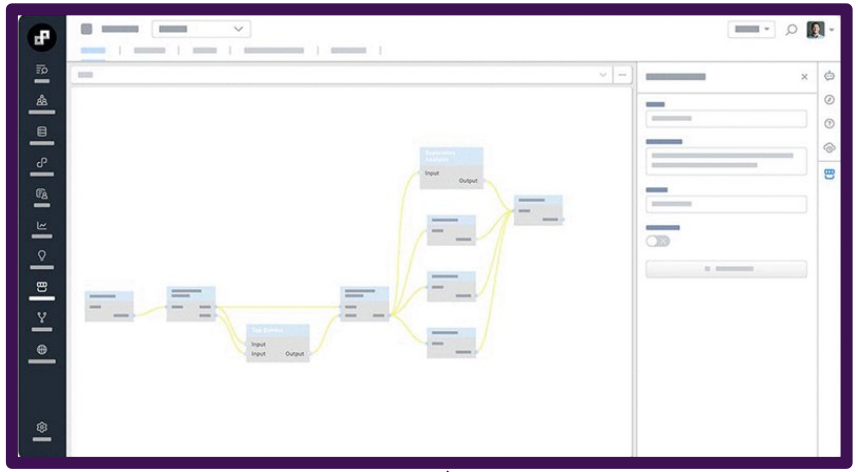
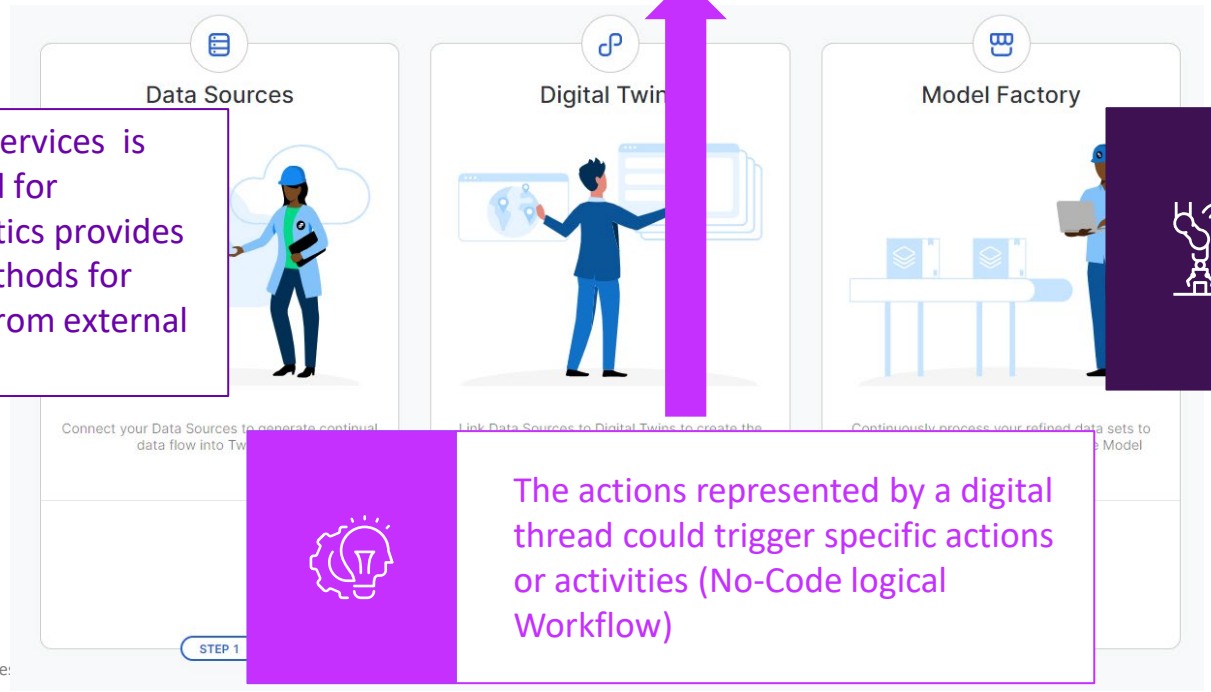
Simplified User Experience







CONNECT data services is system of record for Advanced Analytics provides a number of methods for collecting data from external sources



A digital assembly line for automating machine learning (ML) model creation and deployment (Use cases templatized model selection)

The actions represented by a digital thread could trigger specific actions or activities (No-Code logical Workflow)

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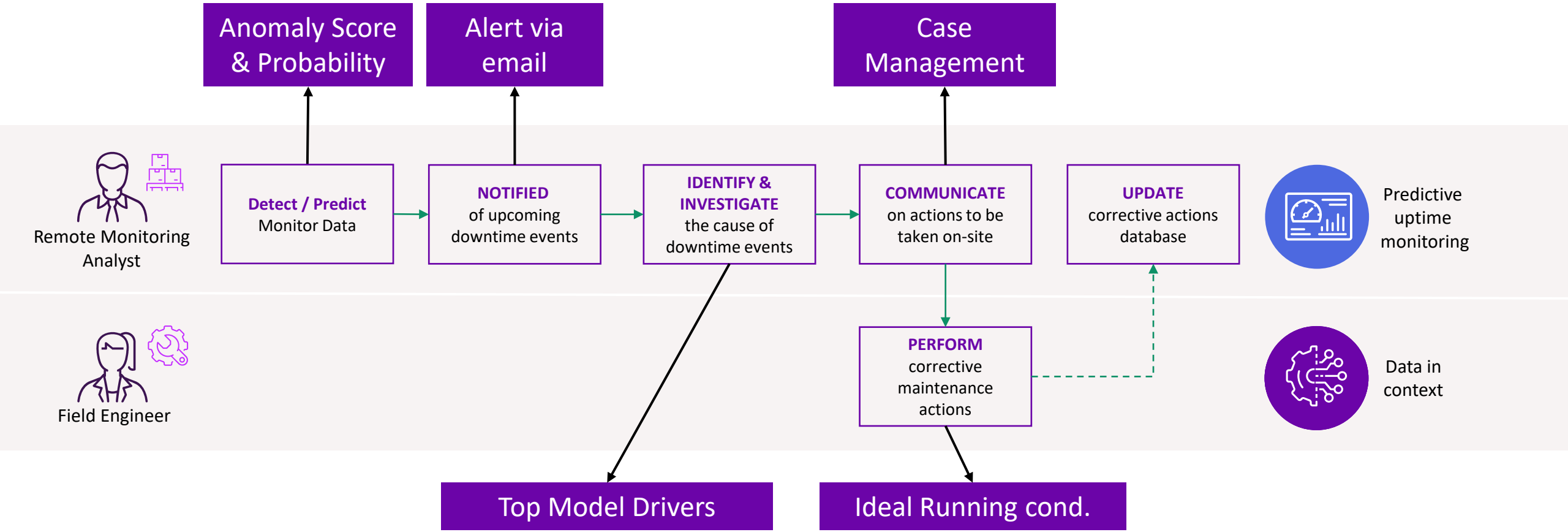
Predictive Uptime – Monitoring Production Parameters



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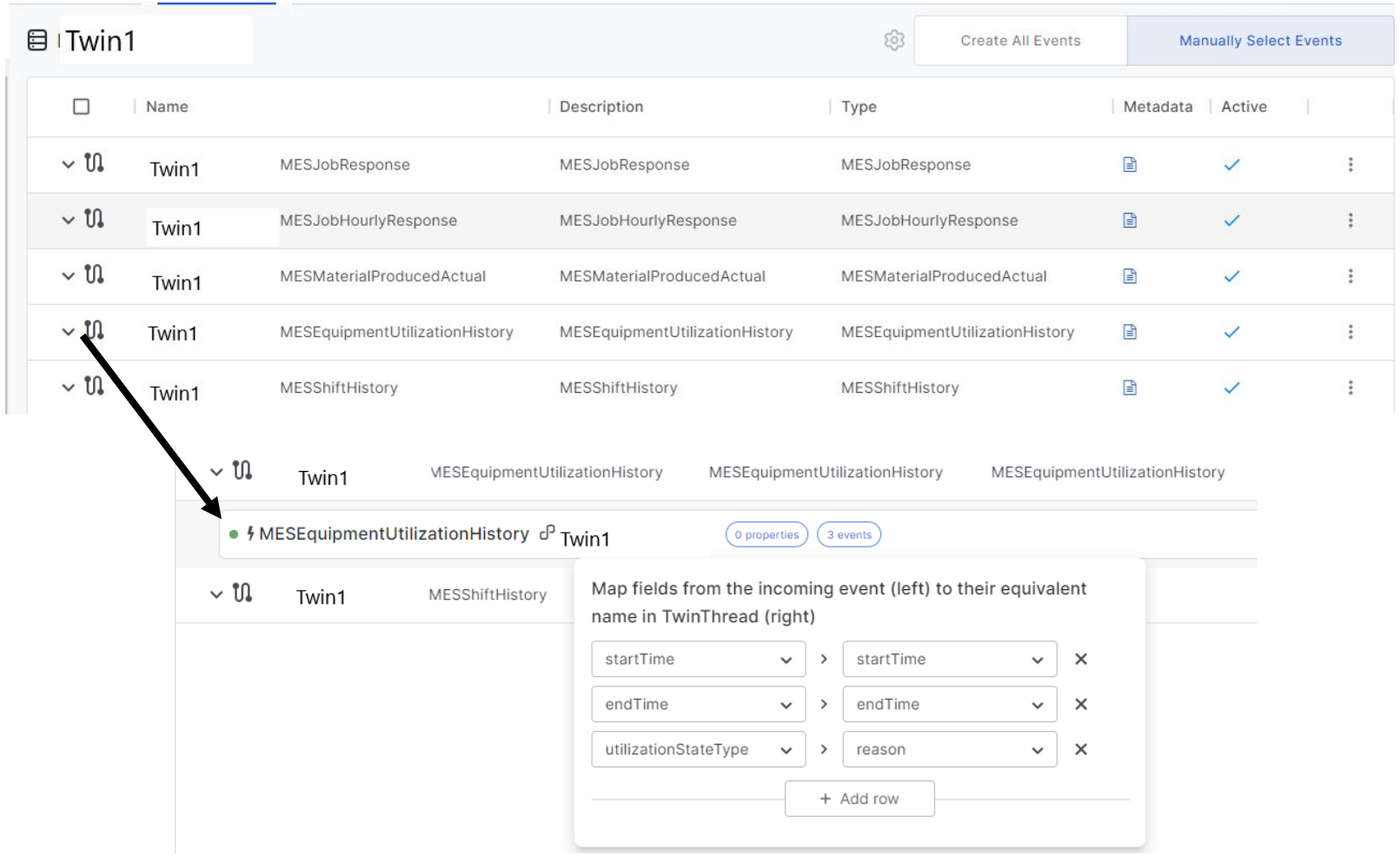
Connected MES data available in Advanced Analytics



- MES Events attached to Cds Assets are automatically pulled into Advanced Analytics
- Default fields from the MES Event are mapped to the proper fields in the Advanced Analytics Events
- The user can modify or extend this mapping as needed

- Primary MES Events used by Advanced Analytics
  - MESEquipmentUtilizationHistory – defines the state of the Asset (ie. Running, idle, down, maintenance, etc)
  - MESMaterialProducedActual – defines the product being produced over each interval and the quality results

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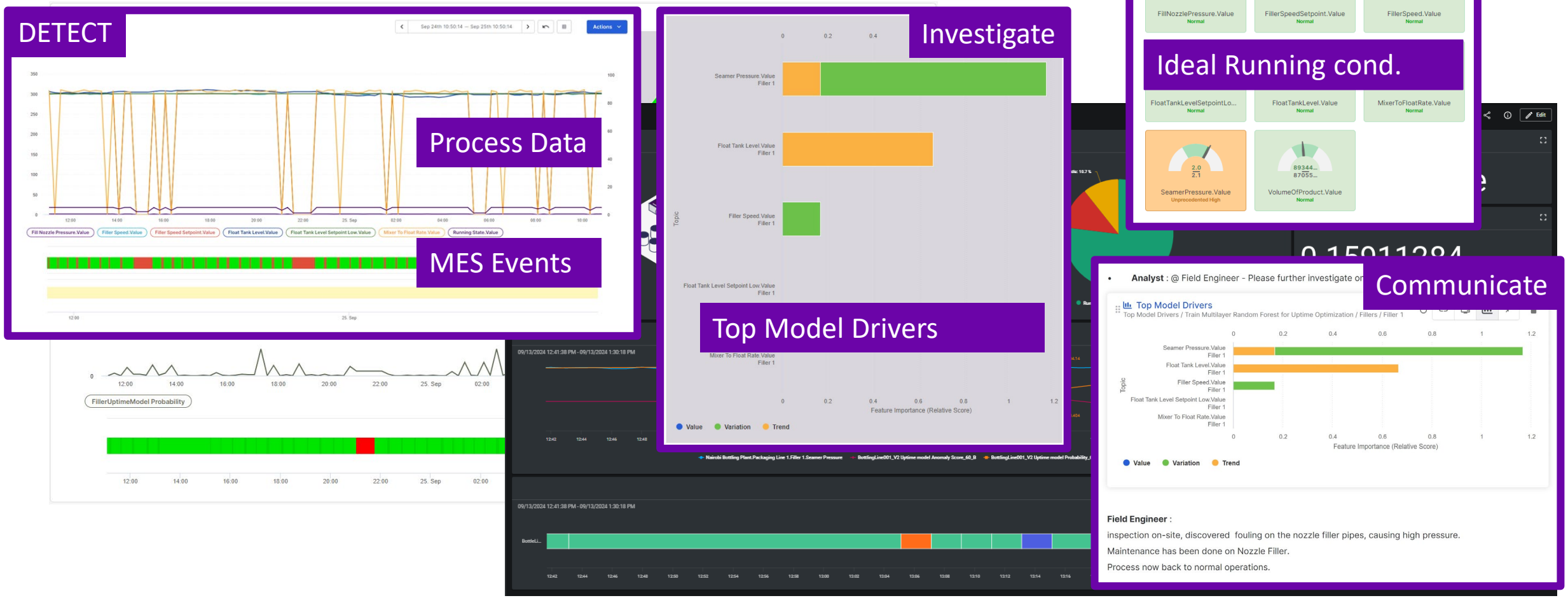
Predictive Uptime Monitoring

Monitoring Highlights and outcome



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MANUFACTURING - CONSUMER PRODUCTS | USA

Nestlé: Harnessing advanced analytics and real-time data in the cloud to enhance product quality and minimize waste

Challenge

- Fully manual operation of the agglomeration process caused variability in product moisture and density
- Low product yield due to low moisture
- Inconsistent product caused unnecessary waste

Solution

- Deployed CONNECT and transferred data via AVEVA™ Historian. AVEVA™ Advanced Analytics was used to predict quality parameters of powder production and recommend optimal process setpoints, removing the need for resource-constrained on-premises systems to carry the additional burden of supporting this solution.

Results

- **A 10% savings on Nesquik powder in the trial, or 101g saved from every 1kg jar**
- **Consistently tighter jar-to-jar weight variation**
- **Improved product consistency and consumer satisfaction**
- **Less product waste on production and packaging lines**

"Working with AVEVA's Lighthouse team helped us to understand how we can realize even more value from our solution in the future. For instance, running the solution in the cloud means we can easily roll out the analytical model to other plants across different regions without needing to invest in additional on-premises infrastructure.

***Greg O'Brien**, Project Engineer and Project Owner, Nestlé*

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To learn more

Jean-pierre.caron@aveva.com

- Expo area
- Upcoming Related session
  - Wednesday 9:00 AM – 9:30 AM AVEVA's Industrial AI: Generate impact to achieve greater goals
  - Wednesday 13:15 PM – 13:45 PM Harnessing AVEVA Advanced Analytics for Enhanced Quality Control powered by CONNECT at Coromandel International Limited
  - Wednesday 14:45 PM – 15:15 PM Nestlé: Harnessing advanced analytics and real-time data in the cloud to enhance product quality and minimize waste
- Past Presentation (Post conference Review)
  - Tuesday 1:30 PM – 2:00 PM AVEVA's Reimagining the AVEVA MES portfolio to support the transformation objectives of modern enterprises
  - Tuesday 2:15 PM – 2:45 PM Amcor : Enterprise analytics and visualization of MES/process data
  - Tuesday 3:15 PM – 3:45 PM AVEVA hybrid MES and CONNECT data and visualization services
  - Tuesday 3:15 PM – 3:45 PM AVEVA: AI-driven industrial optimization at scale with CONNECT
- Contact me (Will bring the required people)

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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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ABOUT AVEVA

AVEVA is a world leader in industrial software, providing engineering and operational solutions across multiple industries, including oil and gas, chemical, pharmaceutical, power and utilities, marine, renewables, and food and beverage. Our agnostic and open architecture helps organizations design, build, operate, maintain and optimize the complete lifecycle of complex industrial assets, from production plants and offshore platforms to manufactured consumer goods.

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. The company is headquartered in Cambridge, UK.

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