









MAY 2022

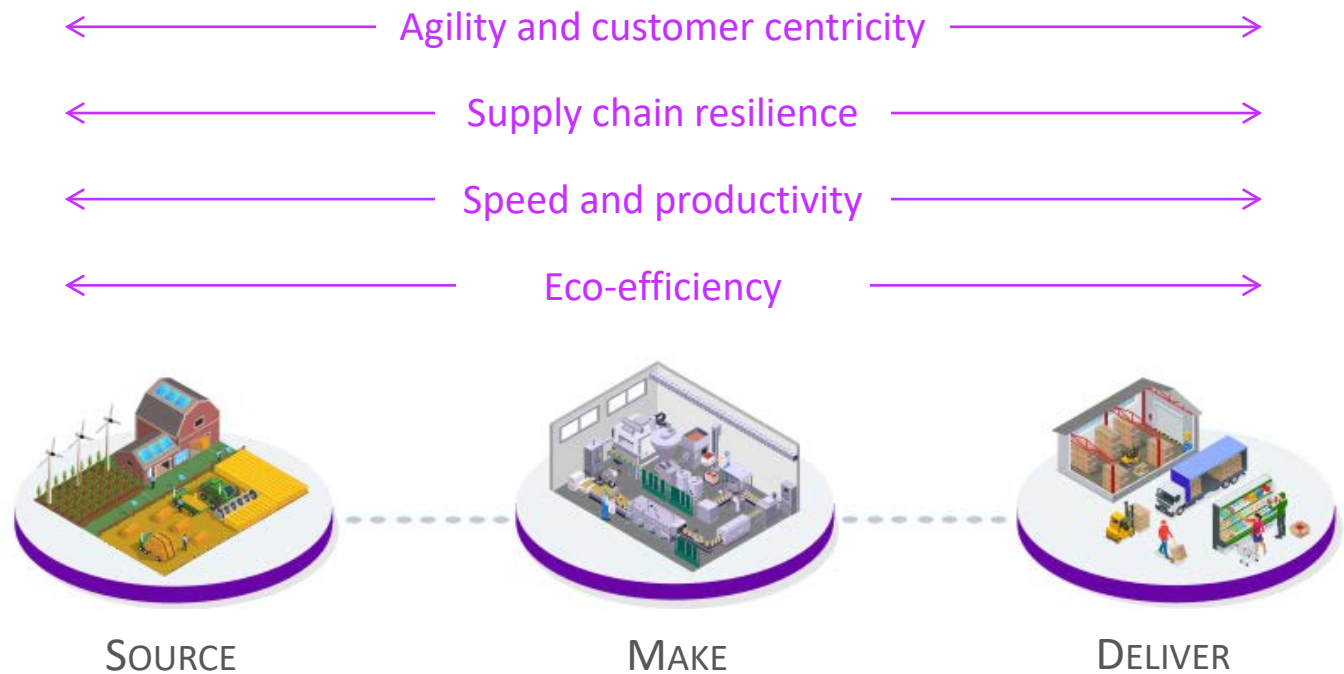
AVEVA Manufacturing Execution System Innovations and Roadmap

Keith Chambers: Vice President, Operations Management Software

AVEVA

Welcome to the “Great Reset”

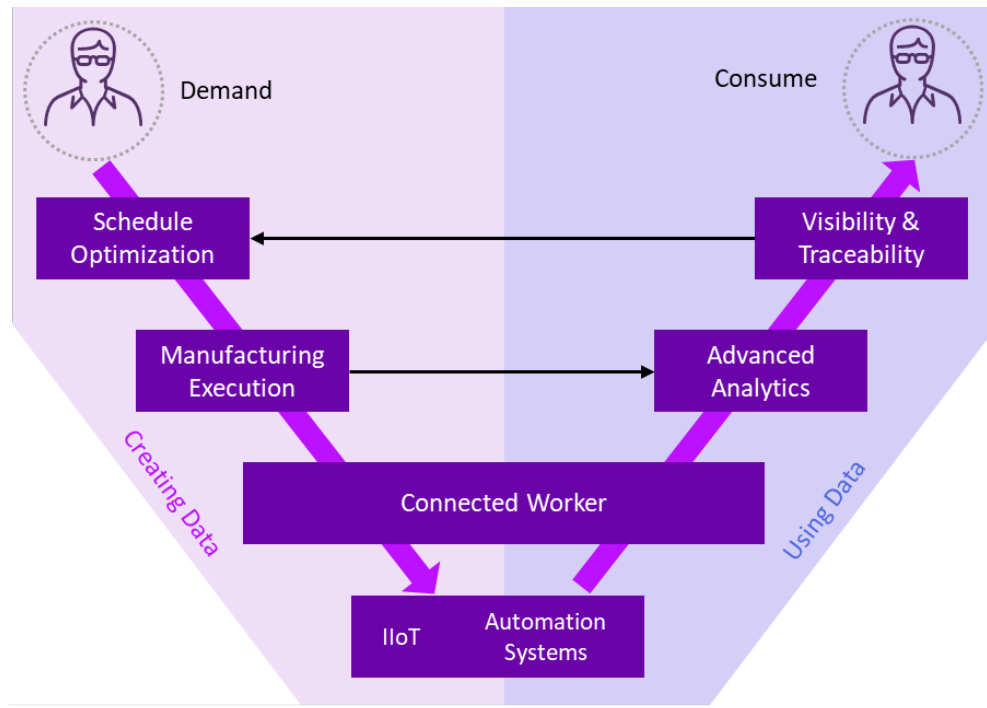
What has changed in the world?	
	Demand uncertainty and disruptions are challenging planning systems
	National security interests, trade barriers and logistics disruption will demand alternatives to globalized supply chains
	Disruption of global manufacturing and supply chains are challenging manufacturers
	Forced transition to remote management and digital collaboration
	Physical distancing regulations for safe return to work are forcing manufactures to reconfigure their manufacturing flows
	Displacement of large parts of the workforce, unbalanced decline and growth between sectors
	Economic recession necessitates rapid operational and capital cost reduction
	Increased global concern for environmental impact of human activities



http://www3.weforum.org/docs/WEF_GLN_2020_Four_Durable_Shifts_In_Manufacturing.pdf

The Role of MES in the “Great Reset”

Delivering on growth, profitability and sustainability as part of a digital thread



AVEVA's Digital Thread for Value Chain Optimization

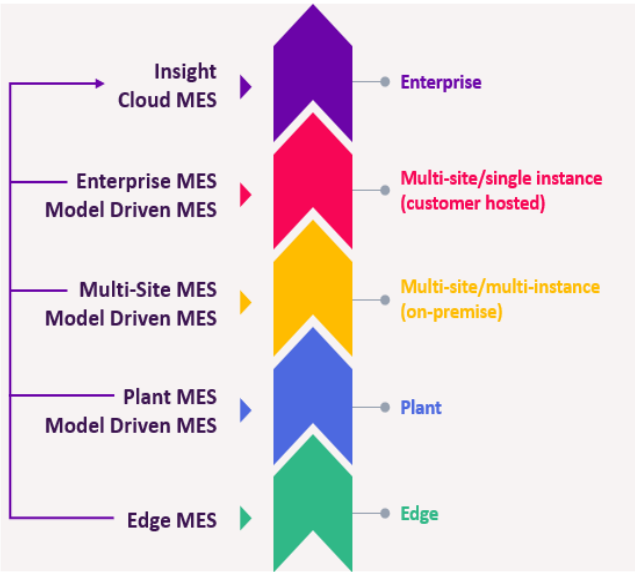
- MES provides a key element in the digital thread from your customer, to the plant floor and back
- MES receives the plan from supply chain planning systems and optimizes its execution around both business and operational drivers
- It provides critical context to production “big data,” enabling better visibility, decisions making and fueling the use of advanced analytics to optimize production processes
- Today MES is
 - Multi-site
 - Connected to the supply chain
 - Integrated with both automation and workers
 - Drives best practices across the manufacturing network
 - Supplies context for advanced analytics

Big Themes in AVEVA MES for 2022

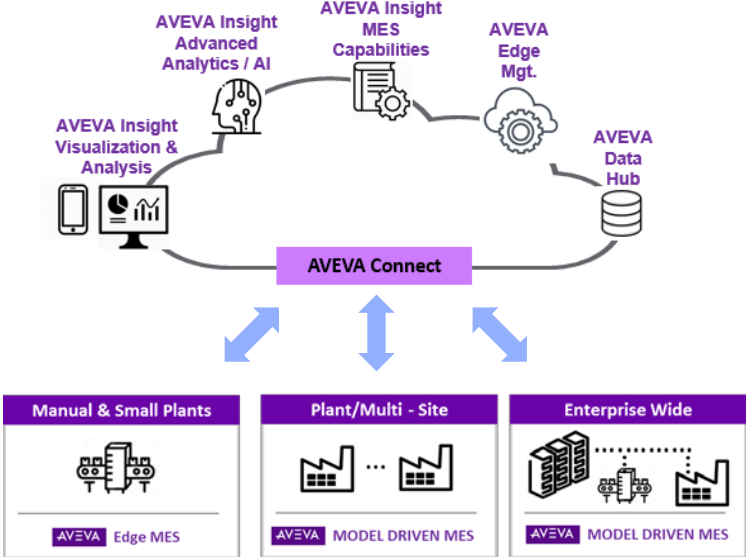
Model Driven & Extended Capabilities



Edge to Enterprise Deployment

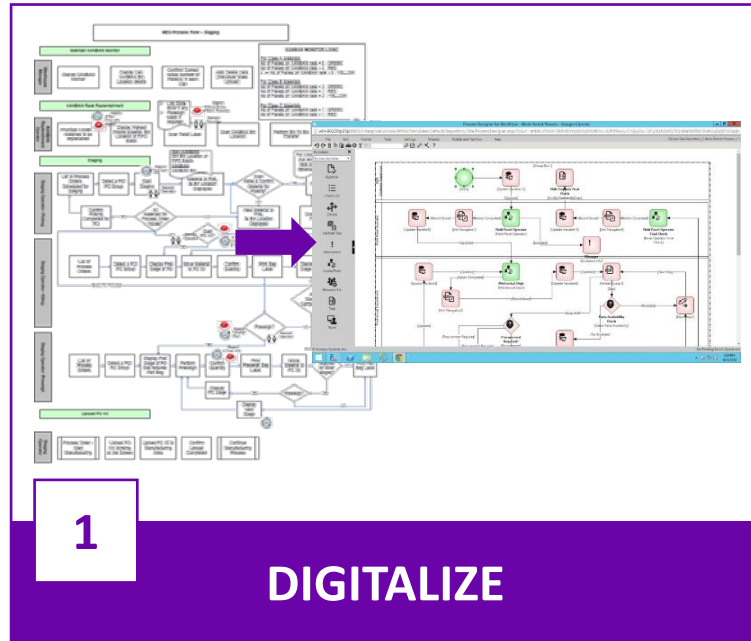


Connected MES



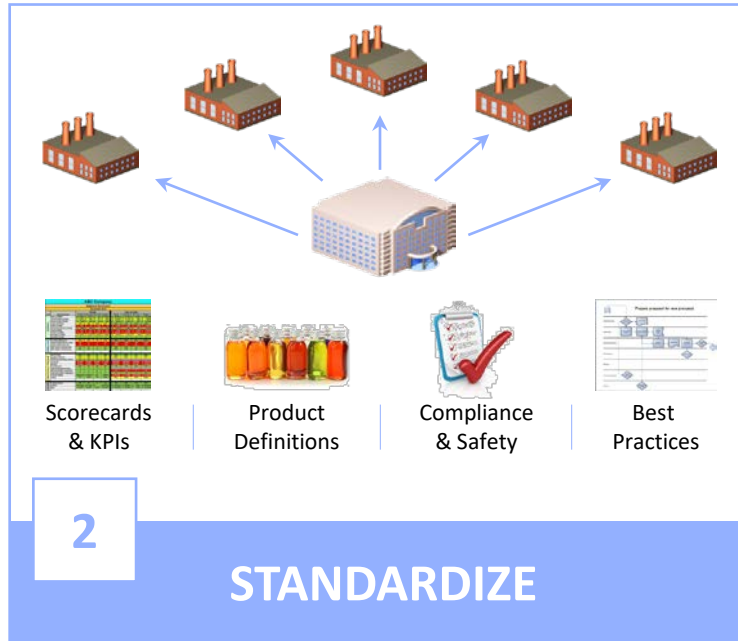
Model Driven MES

A process-based approach to manufacturing operations management

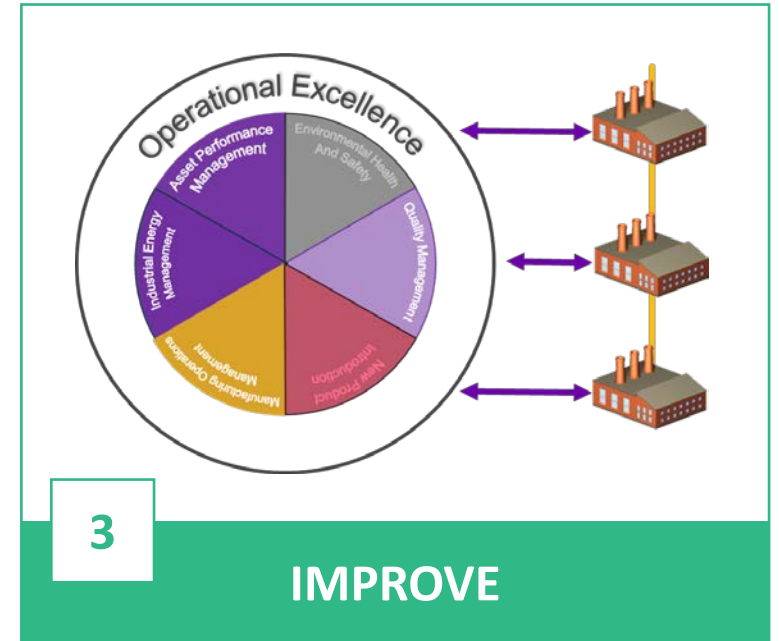


Capture manufacturing processes and collaborations and digitalize them using low code technology

Transform how work is done in the plant



Manage best practices, KPI's, product specifications and compliance and safety data between sites



Continuous improvement of processes based on rich data collection with governed change management

Model Driven MES Architecture

Operational Activities Modeling for Digital Execution, Standardization and Continuous Improvement

Operational Activities Framework:



AVEVA Workflow Management

- **Workflow model** defining the procedures and collaboration of work execution and data collection
- **Configurable and sustainable User Interface** to meet our customers operational activity practice

↕ **Integration**



AVEVA Manufacturing Execution System

- **Production Process model** with execution and data collection rules, and specification data
- **Information model** for accessing and storing work planning and execution data + KPI's in real time

↕ **Integration**



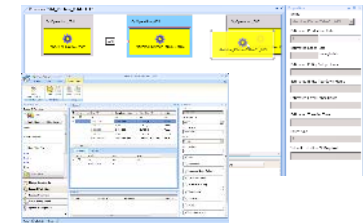
AVEVA System Platform

- **Equipment model** with integration to process data for automatic data collection, recipe parameter download and enforcement of process rules and specifications (BOM) through e.g. Barcode or RFID

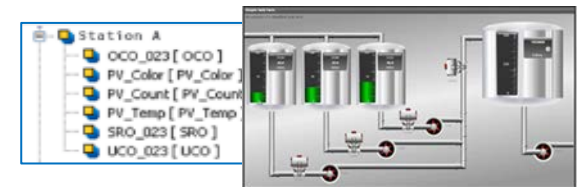


User Interfaces

Business Rules



Process Model, Product and Work Specifications

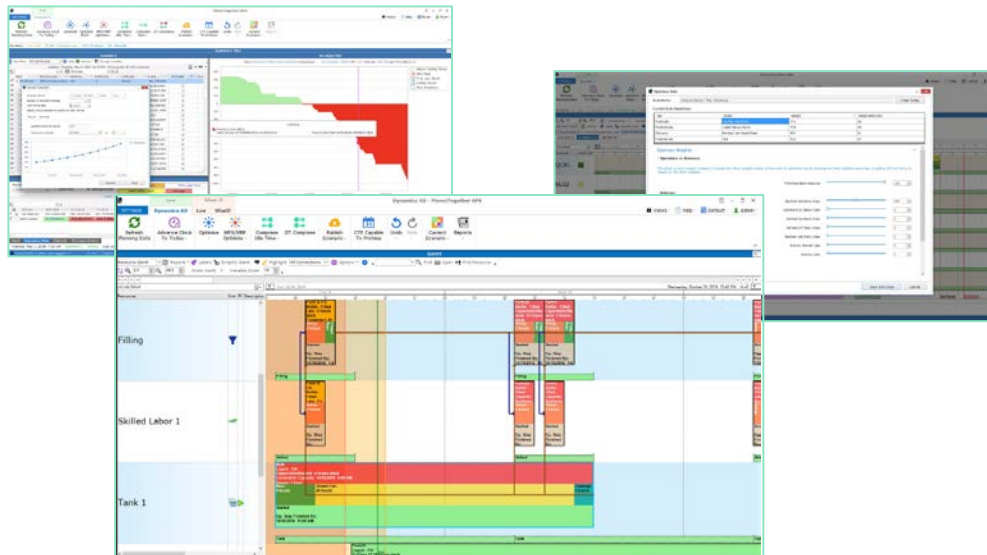


Physical Model and Process Visualization

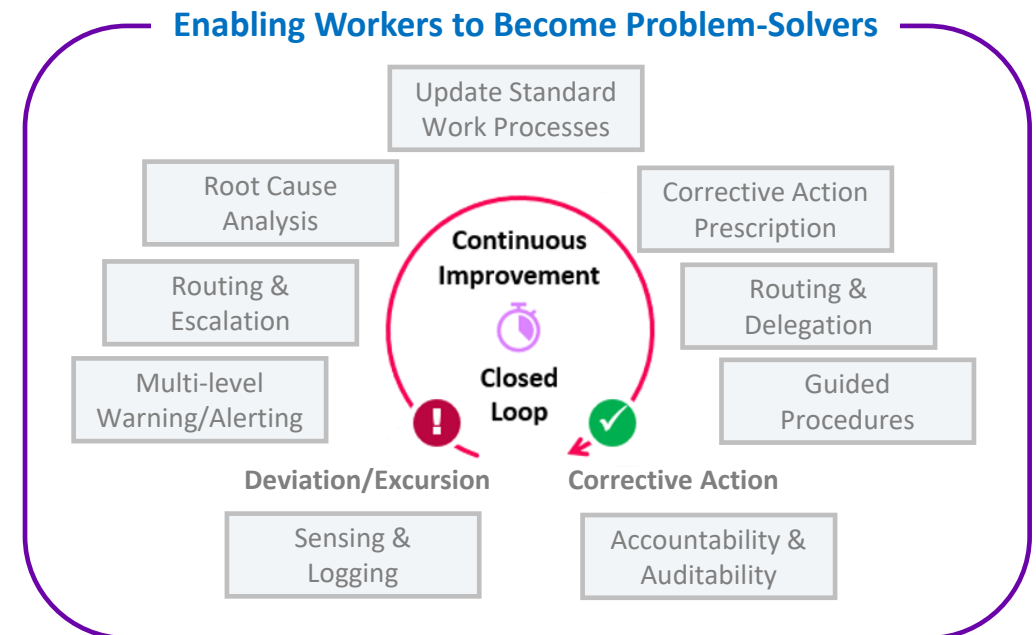
Extended Capabilities

Planning & scheduling, digital procedures

- Advanced Planning and Scheduling by PlanetTogether
- Extends MES with full APS capabilities, with out of box integration to AVEVA MES, ERP and Supply Chain S&OP Systems

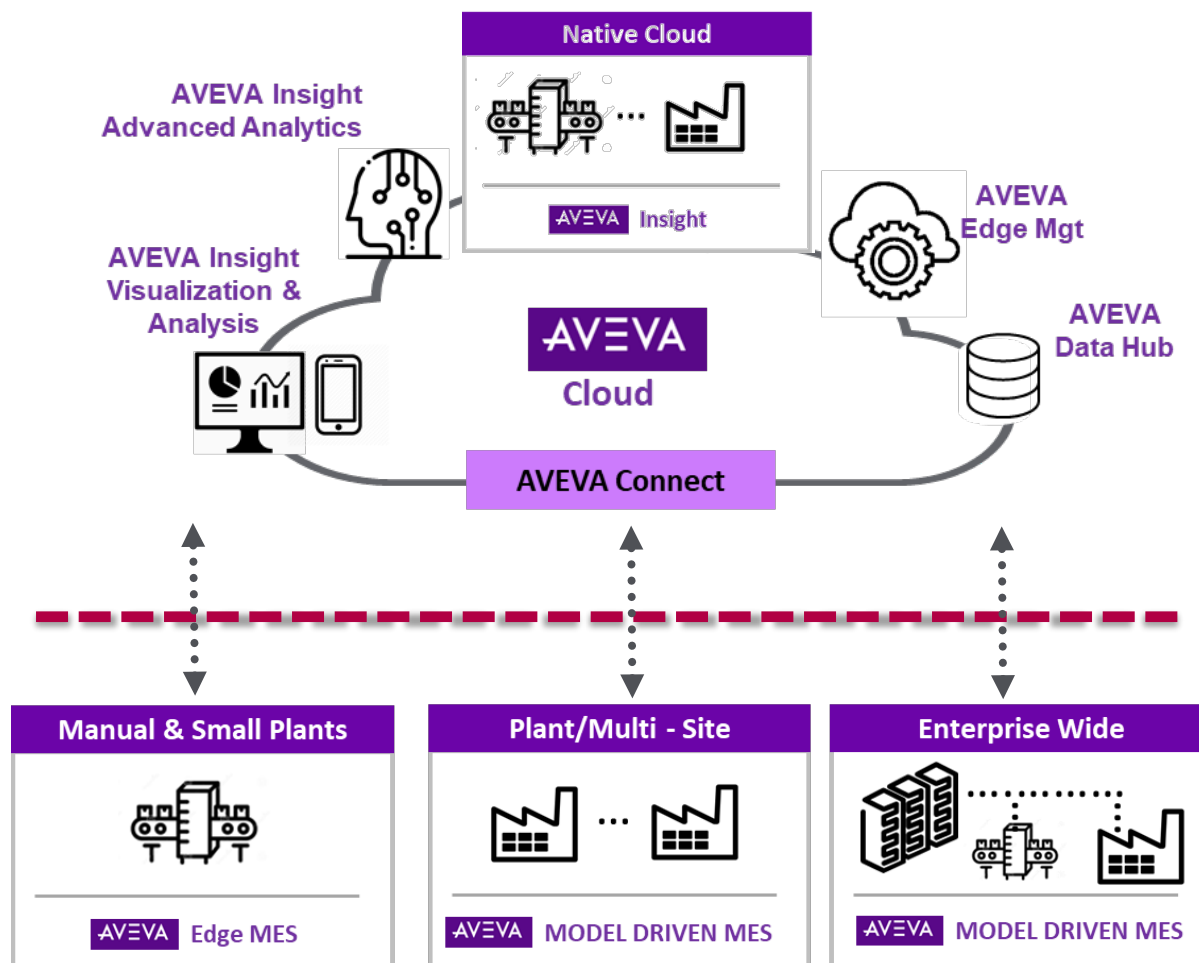


- Digital closed-loop work process – leverage MD MES framework to drive broader action management and operational governance on the plant floor



Edge to Enterprise Deployment Options

Suite of MES configurations to lower cost of ownership



Edge to Enterprise MES...

Model-Driven (MD) Enterprise MES:

- Full-featured, Manufacturing Operations Mgt. (MOM) capability
- Single solution instance deployed in a Remote Data Center (e.g. customer cloud) that services multiple plants

Model-Driven (MD) Plant/Multi-Site MES:

- Full-featured, Manufacturing Operations Mgt. (MOM) capability
- Single solution instance deployed in each plant

Edge MES (Edge Module):

- Simple productivity apps (e.g. OEE, Work Instructions, etc.)
- Single or multiple instances per plant
- Light-weight footprint – built on top of our core MES offering

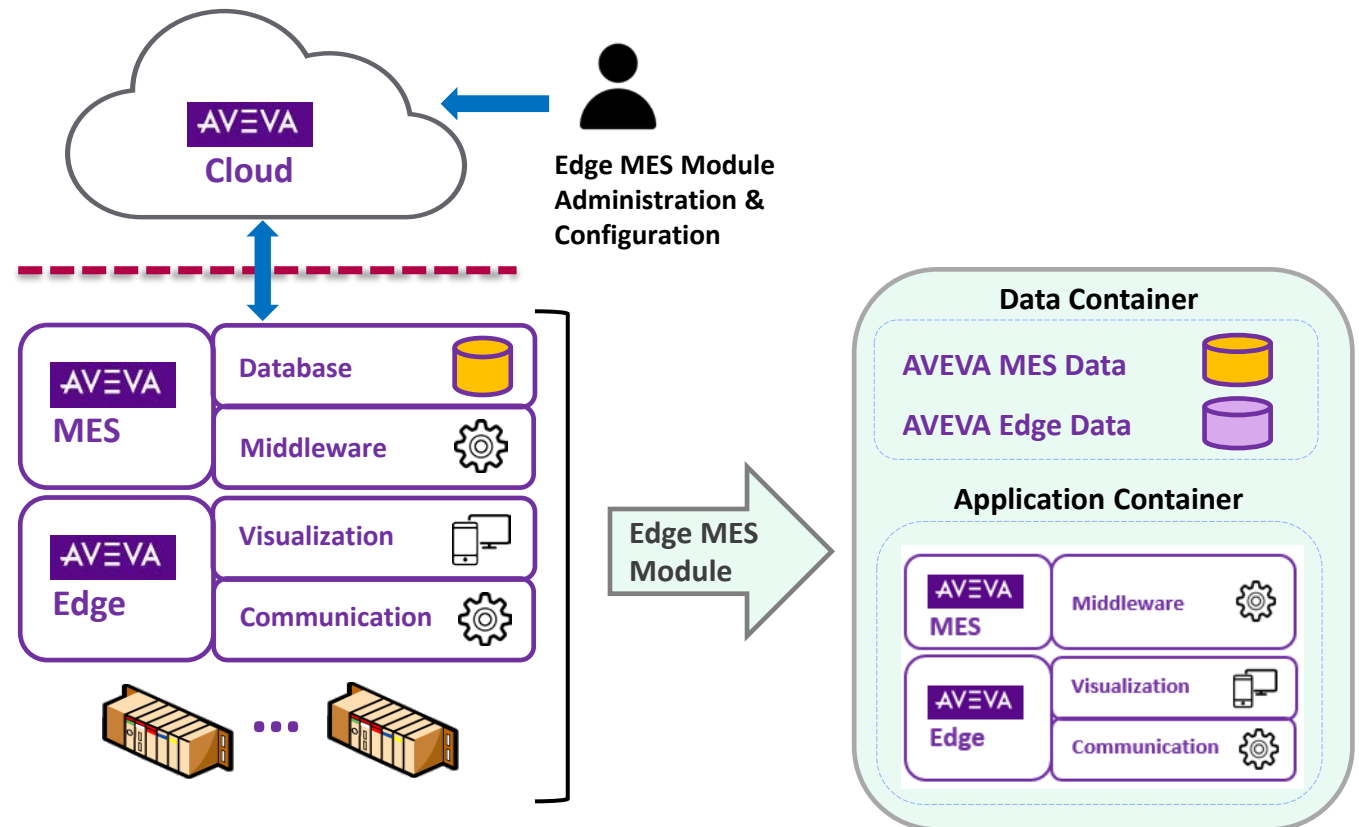
Automation Connectivity (Edge Module):

- Light-weight IoT and automation device connectivity for edge and native cloud apps

Edge MES Overview

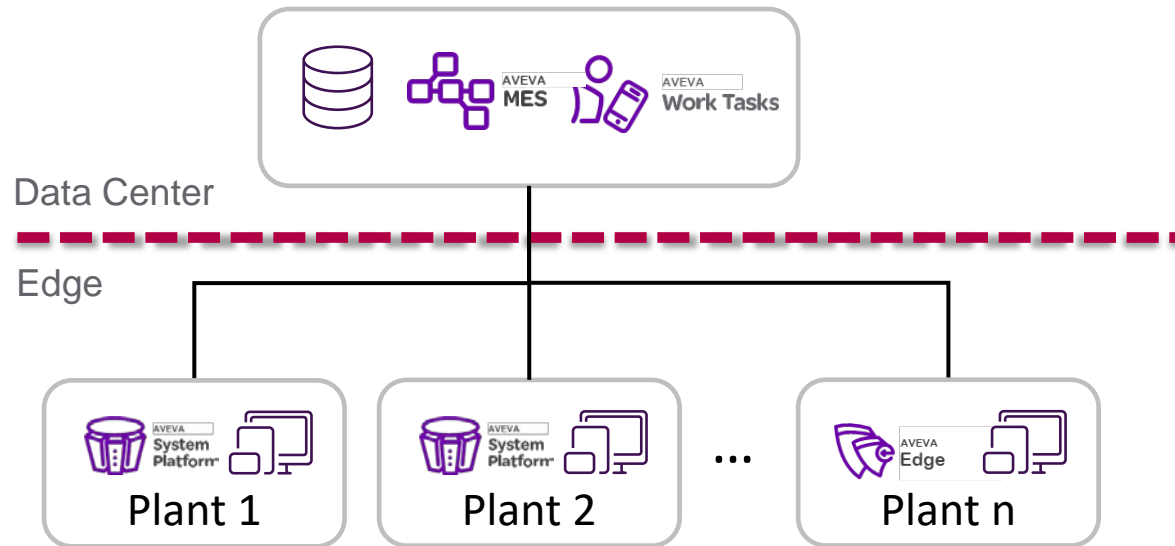
Offering Overview

- Uses AVEVA MES to provide classic MOM functions (e.g. Performance, Production Mgt., Quality Mgt. & Inventory Mgt.)
- Uses AVEVA Edge for automation device connectivity and visualization, as well as business rules layer for lite MES capabilities
- Uses SQL Express or Standard Edition for MES configuration and runtime data
- Will become a fully Cloud managed Edge component
- Will publish to Data Hub as connected MES, with limited, managed on-premise storage

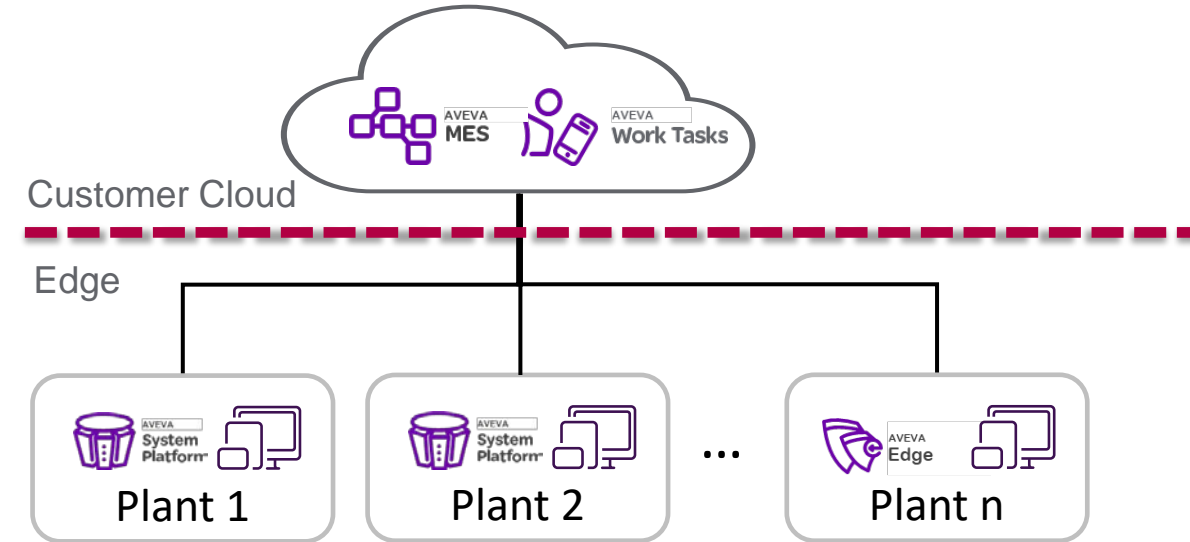


Enterprise MES

Single instance, multi-site deployments



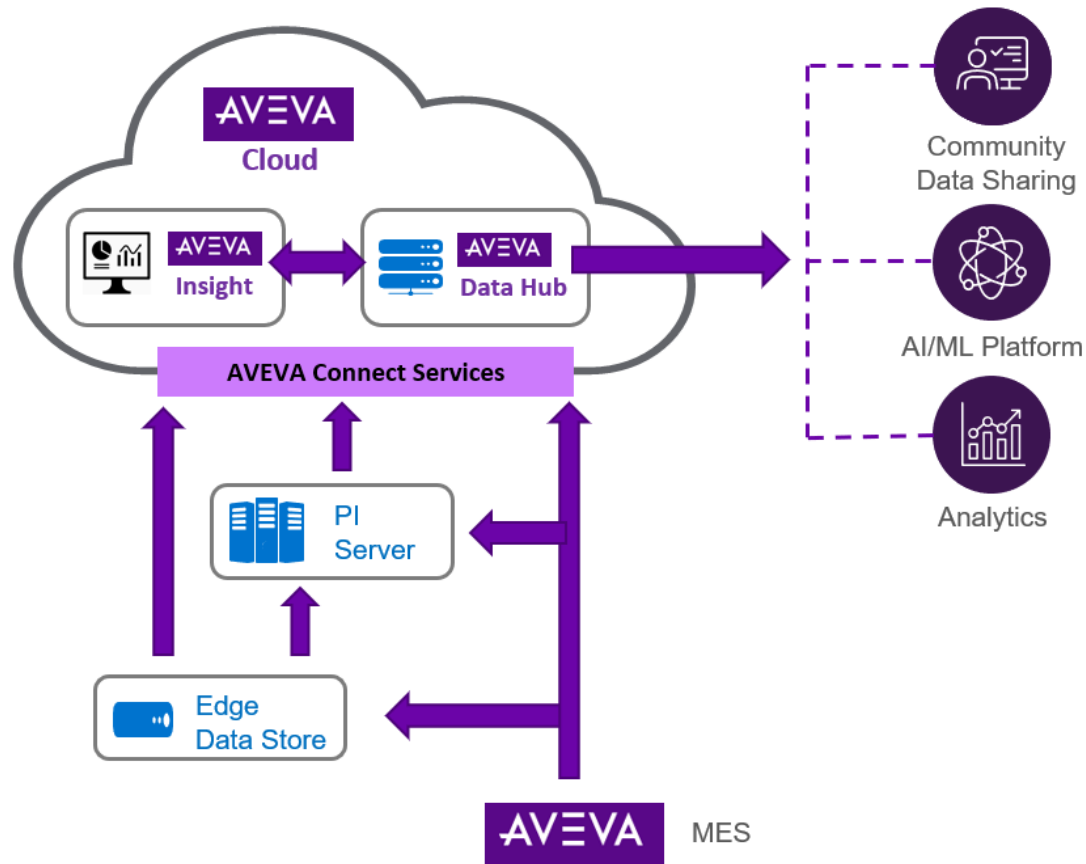
- Several instances in production
- Strict enforcement of common blueprint for solution
- More rapid deployment to sites
- Bump less migration for Edge MES in future



- Early adopters underway Supported for either Azure or AWS
- Driven by IT based, on data center costs
- Increased cyber security, connectivity, bandwidth and latency concerns

Connected MES

Enterprise-wide visualization, analytics and sharing through the AVEVA Cloud



- MES data a connected part of our information management platform
 - At the edge
 - At the smart factory
 - At the enterprise
 - In the cloud
- MES adds production context and events to enable an enterprise-wide data infrastructure
 - Into PI System for site & enterprise visualization and self-service analytics
 - Into AVEVA Data Hub through data publishers for Edge to Enterprise MES offers
- Enables more powerful enterprise visualization, analytics and AI using the full power of our information platform

AVEVA MES Multi-Year Vision & Strategy

What to sell and what's coming up in FY23

CY 2022

Extended Capabilities and User Experience

- New Production Planning and Scheduling SaaS offering (by PlanetTogether)
- New and improved model-driven content
- Web widget support and components for Work Tasks
- New Logbook/Shift Handover template

Edge to Enterprise MES Solutions

- New Edge MES low code performance management template (OEE), built using Web widgets
- Improved Enterprise MES capabilities - single instance/ multi-site deployments

Connected MES

- Existing PI System AF capabilities can be used to connect and historize MES data
- New MES data historization with AVEVA Data Hub

CY 2023

Extended Capabilities and User Experience

- New and improved model-driven content
- New Ux for Model Driven MES

Edge to Enterprise MES Solutions

- Edge MES modules managed centrally from the cloud
- New Edge MES application templates (Operations & Quality)

Connected MES

- Predictive and prescriptive analytics (AI/ML) in the cloud
- New and improved dashboarding with AVEVA Insight



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AVEVA is a global leader in industrial software, driving digital transformation and sustainability. By connecting the power of information and artificial intelligence with human insight, AVEVA enables teams to use their data to unlock new value. We call this Performance Intelligence. AVEVA's comprehensive portfolio enables more than 20,000 industrial enterprises to engineer smarter, operate better and drive sustainable efficiency. AVEVA supports customers through a trusted ecosystem that includes 5,500 partners and 5,700 certified developers around the world. The company is headquartered in Cambridge, UK, with over 6,500 employees and 90 offices in over 40 countries.

Learn more at www.aveva.com