

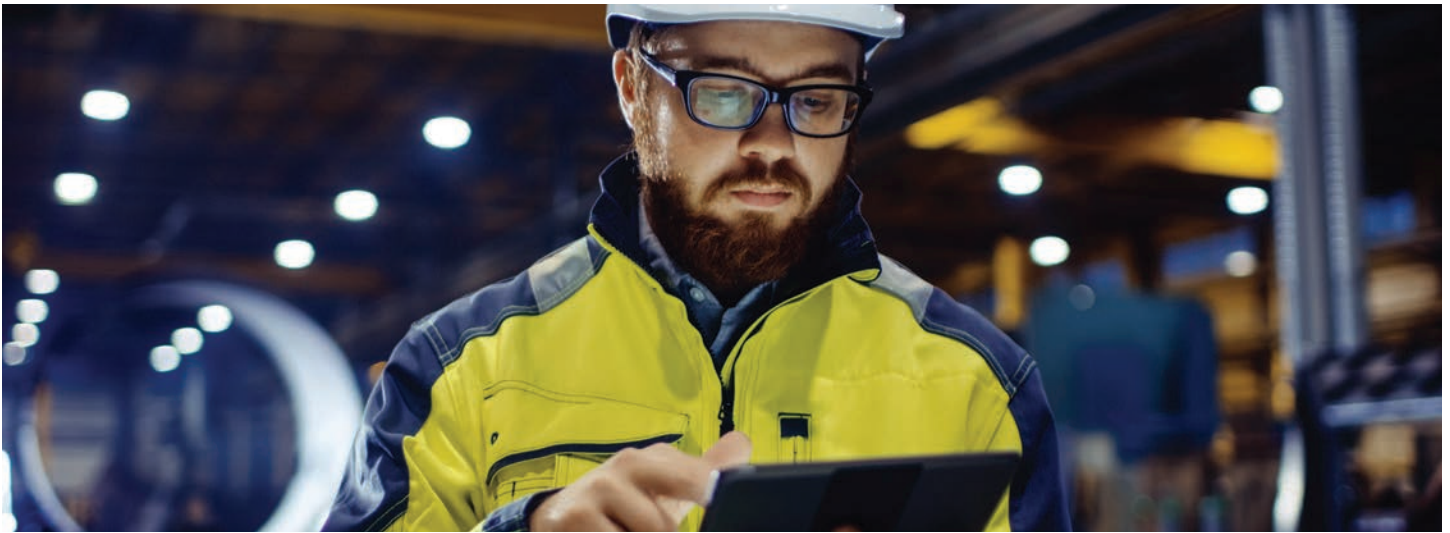


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# Model-Driven Manufacturing Execution System

A process centric approach to the digital transformation of best practices for reuse, sustainable standardisation and continuous improvement in plant and multi-site manufacturing operations.



## Digital transformation of manufacturing operations

Unlock and sustain the full value of your manufacturing business by aligning people and processes with advanced digital technologies for a cost effective and consistent approach to operational excellence, compliance, transparency and business agility across the enterprise.

Maximise profitability, quality, and compliance in manufacturing by digitally managing the business rules and capturing information for all operational activities and plant events in real time.

AVEVA's work process-centric and Model-Driven approach further reduces the time to value and cost of ownership of manufacturing execution system (MES) deployments and multi-site roll outs through the digital transformation of operational processes for standardisation with agility to adopt change, to continuously improve operational efficiency and the return on MES investment.

Our customers achieved the following average benefits by implementing our Manufacturing Execution System:

30%



Quality Improvement

30%



More Equipment Uptime

20%



Reduction in Manufacturing Costs

10%



Increased Productivity

20%



OEE Improvement

# Manufacturing Operations Management

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Manufacturing organisations are transforming their businesses by digitally transforming their business processes to deliver new and improved offerings that improve profitability or increase revenue and delight customers.

Digital transformation of manufacturing operations similarly transforms work processes to deliver productivity and performance improvements, increase manufacturing flexibility, while securing quality and consumer safety, and reducing the cost of compliance to internal or external regulations.

AVEVA's Model-Driven MES approach combines the traditional benefits of a manufacturing execution system with modern digital workflow management technology to bring people, organisations and processes together for increased efficiency as well as for capturing work processes and operational procedures in digital workflows and related user experience configurations (models).

Model-Driven digital transformation of work processes provides a higher level of automation, enforces consistency of operational activities and allows for systematic collaboration across teams and organisations.

The digital and graphical modelling of work processes and operational activities fully abstracts them from solution architectures and technology implications. The result is a new level of sustainability and reusability which is a key enabler for sharing best practices and standardisation of processes across lines, plants and multi-site enterprises.

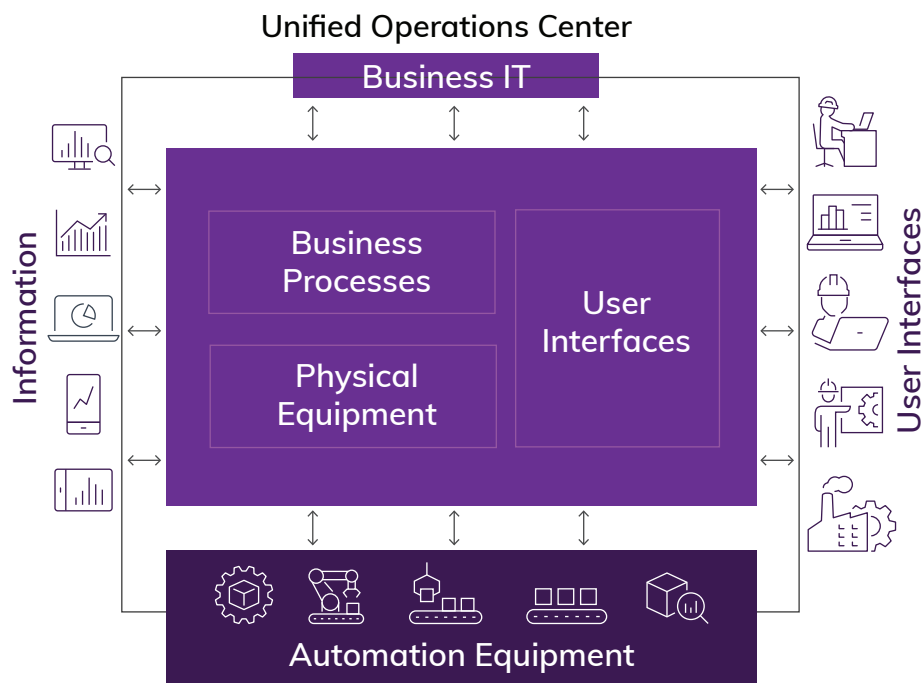
## Model-Driven MES/MOM enables our customers to:

- Digitally Transform Work Management – provide the ability to define operational practices as digital workflows that cross-over organisational and application boundaries
- Provide a consistent user experience from desktop and mobile
- Orchestrate Collaboration – provide a digital collaboration framework to coordinate people and/ or applications in a consistent and governed manner
- Deploy Modular MES Applications– provide the ability to deploy the “right-sized” solution to meet specific business needs
- Standardise operational work practices across a manufacturing enterprise, and cater site-specific practices as well
- Centrally develop and manage corporate standards for MES/MOM functions and applications
- Sustain and deploy new versions of standards in an agile and cost-effective manner
- Enable Multi-Site Change Management & Agility – provide the ability to evolve the solution to meet changing business needs across a manufacturing enterprise.

# A platform for the digital transformation in manufacturing operations

AVEVA's Manufacturing Operations Management platform minimises the risks and costs of MES deployment and reduces the time and effort for multi-site roll outs with:

- **An open engineering and runtime platform**, leveraging digital workflow management capabilities, hardened for industrial use and designed for integration of business, manufacturing operations and production processes and data.
- **A scalable MES application with broad manufacturing management functionality ranging from performance optimisation to inventory, production and quality operations management.**
- **A reusable work process and related user experience modeling approach**, which standardises all operations, simplifies deployment of processes to equipment, systems and people.



Manufacturing organisations can use this platform and modeling technique to:

- Drive higher levels of efficiency, collaboration and agility in plant operations by digitally transforming work processes and data collection procedures.
- Shorten the time to value for operational excellence initiatives across multi-site operations with the tools and support for a Center of Excellence approach for capturing best practices and standardisation of processes, KPI's and reporting.
- Reduce the total cost of manufacturing IT ownership through the harmonisation of technology and applications used across the enterprise.

# Manufacturing operation management capabilities

AVEVA's Manufacturing Execution System offers a complete set of functions to efficiently manage and document operational processes and material flow in industrial manufacturing plants. Manufacturing Execution System includes inventory, production and quality operations management and plant performance monitoring functionality which can be scaled to individual needs or incrementally implemented for faster return on investment and alignment with business priorities.

- **Production Management** - digital information and rules management for work order dispatching and tracking for any combination of manual or automated equipment job execution.
- **Inventory Operations Management** – real time tracking of materials, semi-finished and finished products including receiving, transfers or for managing Kanban inventory as materials are consumed and products are made.
- **Bill of Material and Recipe Management** - Quality losses can be minimised and consistency improved through enforcement of product and process specifications.
- **Track and Trace** - Reduce the cost of regulatory compliance and protect brand equity with automatic electronic record keeping for detailed product genealogy and end to end material traceability in minutes.
- **Enterprise Integration** - Integration with Enterprise Resource Planning enables agile, short-term production management and provides schedule flexibility and adoption for the plant as well as supply chain visibility into operations and inventory.
- **Quality Operations** - Automate and enforce quality inspection and data collection procedures in alignment with the real-time status of work order and job execution, and in response to shop floor events for reducing giveaway and variance in production results.
- **Plant Performance Management** - Unlock more value and capacity from existing assets with visibility into line and plant equipment utilisation and Overall Equipment Effectiveness (OEE) KPI's.
- **Digital Workflow Management** - Automate operational activity and data collection processes, eliminating paperwork and manual error-prone procedures.
- **Empowerment and Mobility** - Empower the modern workforce with a digital and mobile user experience and keep them connected with mission-critical processes on and offline.
- **Data Store for Reporting and Continuous Improvement** – detailed manufacturing history as performed vs. planned offers drill down analyses into operational performance and identification of improvement potentials.



# Our Global support for plant and multi-site MES deployment

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## MES best practices and industry solution models out of the box

Collaboration with our MES practice teams allows us to investigate the most common needs in manufacturing work processes, information models and industry solution functionality. We turn these identified industry best practices into generic reusable MES activity workflows and user interface models for reuse with our manufacturing operations platform.

These standard activity and solution models are shared for knowledge and best practices transfer with our partner ecosystem and customers to get MES solutions defined, deployed and running faster.

The out-of-the-box MES activity and industry solution models additionally help our customers to jumpstart their Center of Excellence program with the adoption of industry best practices for a programmatic approach to multi-site MES roll outs.

## A global network of Model-Driven MES services and support

The Center of Excellence is both an organisational structure and an approach to tackling large-scale, complex MES Programs to accelerate the adoption of an MES solution across the enterprise.

With the world's largest network of distributors and system integrators, AVEVA offers local and personalised support to assist in the building and management as well as deployment and support of model driven MES rollouts across single or multiple sites.

**At the Project Level of a Center of Excellence (COE) there are two types of teams:**

1. A Central Team that is responsible for designing, building, maintaining and sustaining the core solution templates at the COE.
  - Experienced and certified partners are available to help manufacturers in adopting the programmatic COE approach, in capturing best practices and creating libraries of reusable, corporate standard processes and operational data collection procedures for roll-out across the entire business.
2. Site-Specific Teams to support the deployment of the solution templates at each site.
  - Our global partner network is locally available around the globe to help with MES platform deployment and implementation of COE libraries, which significantly reduces the effort, compared to traditional multi-site MES deployments, while achieving consistent reporting, comparable KPIs, and enforcing compliance to company-wide standards.

For more information on Model-Driven Manufacturing Execution System, please visit: <https://sw.aveva.com/operate-and-optimise/batch-and-hybrid-management/manufacturing-execution-system>