Manufacturing Operations Management
How do I run my manufacturing operations better? Different terms are just trying to explain how wide the scope can be.

The best name to describe the whole "category" of Level 3 operations is indeed Manufacturing Operations Management, or MOM.

MOM represents a holistic solution to improve manufacturing operations performance.

MOM systems are built to consolidate the management of several production processes, such as quality management, sequencing, non conformance management, asset management, and so on, within one system.
Manufacturing Operations Management is the core element to link PLM & Automation and to provide a real-time Industry Software layer

- Plant model
- BoM, BoP / Recipes
- NPI (new products)

Globalization & consolidation has created enterprise platforms to manage the Supply Chain and PLM processes with no link to the manufacturing base.

The Siemens MOM Platform interacts with ERP, PLM and Automation domains to fill the gap, towards a single coordinated Enterprise.

- Order/Supply chain data
- As-built data
- Manufacturing Execution
- Data collection

- Today SCM and PLM processes have no consistent interaction to the manufacturing base
- Only Siemens is able to have PLM, ERP & Automation into a single coordinated Enterprise
Siemens is expanding its portfolio towards a Manufacturing Operations Management (MOM).

Replicate improvement across all plants and integrate intelligence from the shop floor to the top floor, maximizing efficiency and quality across production operations are the goals of manufacturing companies.

Siemens MOM standardize and optimize manufacturing processes, minimizing lead-times, optimizing asset utilization, reduce global Time-to-Market improving response time and increasing production visibility. This is critical to gaining the full benefits of further investments in manufacturing operations management solutions covering the whole enterprise.
Industry key steps to success:

- Choose technology capabilities that are integrated through a common solution platform and support all aspects of manufacturing operations
- Automate data collection
- Standardize processes
- Guarantee higher quality
- Provide visibility to decision makers investing in Manufacturing intelligence

Only Siemens is able to offer a Complete & Integrated Industrial Portfolio with strong Industrial Software Layer
Global presence of the Siemens MOM Team – R&D and Delivery Hubs
Siemens has probably the largest Manufacturing IT organization in the world

Quick facts:
- HQ in Genoa, Italy
- Core R&D sites in Germany, Italy, UK, India, Austria & US
- Global Delivery Hubs in Key Regions
- Organization of approx 1.500 people
- Considerable Portfolio covering Vertical knowledge in key processes
- 500+ in R&D – significant investment
- Global and worldwide partners network
- Strong growth - Faster growth than market
AS SW Manufacturing Operations Management portfolio: Five strong software offerings

<table>
<thead>
<tr>
<th>WinCC – HMI SW</th>
<th>SIMATIC IT - MES</th>
<th>WinCC OA - SCADA</th>
<th>QSYS - QMS</th>
<th>PREACTOR - APS</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Number 1 HMI-SW</td>
<td>The Leading MES</td>
<td>Open &amp; High End SCADA</td>
<td>Quality Management</td>
<td>World Leader in APS SW</td>
</tr>
<tr>
<td>Complete and powerful HMI-SW functionality for all industry sectors</td>
<td>Full featured MES with model based architecture</td>
<td>Open Architecture for flexible usage</td>
<td>Quality Management</td>
<td>Detailed Production Scheduling</td>
</tr>
<tr>
<td>Highest Availability</td>
<td></td>
<td>Large scale distributed applications possible</td>
<td>Complete PDCA Cycle for Quality &amp; Production</td>
<td>Graphical MPS</td>
</tr>
<tr>
<td>Openness &amp; Scalability</td>
<td></td>
<td>Highest safety</td>
<td></td>
<td>Used in all Manufacturing Sectors</td>
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</tbody>
</table>

5 strong building blocks as foundation for an integrated & complete Manufacturing Operation Management Software Portfolio
Towards The Global Shop Floor
Manufacturers value creation processes start at the plant

- Each plant has its own strategy and they all operate in a very individual way
- Manufacturing operations need to be transparent and coordinated, worldwide
- Successful coordination can only occur through seamless integration of operating levels
- Manufacturers need the right technological enabler to coordinate their manufacturing and R&D/engineering processes
- Cross plant visibility can help to optimize global business

SIMATIC IT offers the right level of responsiveness for today’s and tomorrow’s business requirements
Fulfill the key market challenges with a unique MES/MOM solution

<table>
<thead>
<tr>
<th>Main market challenges</th>
<th>MES/MOM benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Huge market and pricing pressure</strong></td>
<td><em>Improve efficiency, flexibility and visibility</em></td>
</tr>
<tr>
<td><strong>Recent economic crisis</strong></td>
<td><em>Improve strategic decisions and business plans</em></td>
</tr>
<tr>
<td><strong>Achieve the efficiency targets</strong></td>
<td><em>Improve in different areas with key strategic initiatives</em></td>
</tr>
<tr>
<td><strong>Innovation</strong></td>
<td><em>Speed up on new products introduction, release, design, maintenance, …</em></td>
</tr>
<tr>
<td><strong>Quality</strong></td>
<td><em>Improve quality of raw materials, procedures, setups, materials assembly, …</em></td>
</tr>
</tbody>
</table>

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Maximize Typical Manufacturing Execution and Intelligence benefits to the corporate level

<table>
<thead>
<tr>
<th>MES benefits at Plant level</th>
<th>ENTERPRISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced waste and rework</td>
<td>Interoperability with Enterprise, unlocking incremental ERP and PLM benefits</td>
</tr>
<tr>
<td>Higher materials yield</td>
<td>Manufacturing Intelligence with KPI’s &amp; Reporting, facilitating the collection, tracking and reporting of accurate and unified manufacturing performance data</td>
</tr>
<tr>
<td>Improved efficiency of equipment</td>
<td>Plant Execution, systemizing the execution of production (modeling and building a workflow of procedures)</td>
</tr>
<tr>
<td>Improved OEE</td>
<td></td>
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<tr>
<td>Reduced work-in-progress</td>
<td></td>
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<tr>
<td>Increased overall quality</td>
<td></td>
</tr>
</tbody>
</table>

MES-MOM offers significant benefits improving operational performance in the plant and yet has a role to play in strategic initiatives.
SIMATIC IT Portfolio

Production Suite
Production management and execution

R&D Suite
Integrating R&D and manufacturing processes, workflows and data

Intelligence Suite
Real-time data monitoring and historical data collection in a unified environment

Industry Libraries
- Discrete Manufacturing
- Process Industry
- Life Sciences Industry

Value Added Services
A broad concept of Customer Care

- Scalability
- Efficiency
- Profitability
- Consistency
- Flexibility
- Visibility
- Quality
- Transparency
ISA-95 as Siemens MES Standard
ISA-95 defines integration of control and business levels

Four Pillars in ISA-95:
- Process & Product Analysis
- Maintenance Operation
- Production Operation
- Quality Operation
- Inventory Operation

With the SIMATIC IT MES Portfolio, we cover fully the pillars of ISA-95
Both the functionality as the architecture of SIMATIC IT, allow modular, scalable approaches and enable faster roll-outs
The open and diversified SIMATIC IT portfolio enables collaboration across plants and integration with ERP, PLM, SCM ...
SIMATIC IT Production Suite for Increased Performance and Synchronized processes

**Production Suite**
Production management and execution

- SIMATIC IT Production Suite organizes and integrates the manufacturing process, including standard operating procedures, control points and business events.

- SIMATIC IT Production Suite is based on the ISA-95 standard and synchronizes business processes with manufacturing processes, collecting and providing production and quality data.

**Manufacturing Workflow**

- Cross industry standard software
- Flexible and Scalable
- True ERP collaboration through interoperability
- Lower cost of ownership
- Fast to roll-out
- Secure existing investments
SIMATIC IT R&D Suite
for Increased Brand Value and Faster Time-to-Production

R&D Suite
Integrating R&D and manufacturing processes, workflows and data

- SIMATIC IT R&D Suite decreases time-to-production and positively influences market position, cost and business results based on that capability.

- SIMATIC IT R&D Suite uses key capabilities of SIMATIC IT Production Suite, combined with dedicated libraries comprising functionality that is adapted to R&D Environments in order to provide key collaboration tools.

Key Features
- Production Modeling, Material Management, Laboratory Information Management (LIMS), Product Specification Management
- Electronic Lab Notebook (ELN) to drive the day to day drive the day-to-day operational R&D activities and to document experiments and to make knowledge available within a common repository.
- Formula Work benching Temporary Workspace Re-use of what is already available in SIMATIC IT Interspec Formulation Development with cloning & copying capabilities, calculation support.
SIMATIC IT Intelligence Suite
for Optimum Visibility

Intelligence Suite
Real-time data monitoring and historical data collection in a unified environment

- SIMATIC IT Intelligence Suite turns large amounts of manufacturing data into real knowledge and drives business results based on that knowledge.
- SIMATIC IT Intelligence Suite in each plant can deliver KPIs to a centralized Data Mart and provide an overview for manufacturing executives with drill-down capabilities.

**KPIs**
- **Time Held, Time Late, Lead Time, Running Time, WIP, Queue, On Time Quality**
- Dashboards and scorecards

**KPIs**
- **Machine States, Reliability Algorithms, Performance and Quality Algorithms, Design Speed Algorithms, State Duration, Cycle time**
- Dashboards and scorecards

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SIMATIC IT Portfolio: MES for Verticals

**Production Suite**
Production management and execution

**R&D Suite**
Integrating R&D and manufacturing processes, workflows and data

**Intelligence Suite**
Real-time data monitoring and historical data collection in a unified environment

**Industry Libraries**
- Discrete Manufacturing
- Process Industry
- Life Sciences Industry

**Value Added Services**
A broad concept of Customer Care

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**Discrete Manufacturing**
Scalability
- Efficiency
- Profitability
- Consistency
- Flexibility
- Visibility
- Quality
- Transparency

**Process Industries**

**Life Sciences Industries**
SIMATIC IT MES for Verticals
Technological Highlights

- SIMATIC IT for Process Industries
- SIMATIC IT for Discrete Manufacturing
- SIMATIC IT for Life Sciences Industries

Continuous Investment in Repeatability and 360° Interoperability
Industry Orientation:  
Standard Software + Vertical functionality packages

Process Industries

MES for verticals:
- Primary Production Mgt
- Secondary Production Mgt

Including:
- Integrated Quality
- Asset & Utilities Mgt
- Detailed Scheduling

Discrete Manufacturing

MES for verticals:
- Assembly & Complex Manufacturing
- Assembly in a box
- Automotive

Including:
- Quality and Non conformance
- Detailed scheduling

Life Sciences Industries

MES for verticals:
- Electronic Batch Recording (eBR)
- Weighing & Dispensing

Including:
- Integration with R&D Suite functionality: Specification Management, LIMS, ELN, Formula Workbench
- Detailed scheduling

(Enterprise) Manufacturing Intelligence
MES for Verticals: Faster project implementation with lower TCO

- Efficient application engineering and standardization through a modular approach and the reuse of model sections
- Reduction of the configuration effort on a project, building MES solutions with fast ROI (Return on Investment) and low TCO (Total Cost of Ownership)
SIMATIC IT Value Added Services (VAS) offers significant benefits to customers through an innovative Maintenance concept, a new Partner Program and Technical Training.

**SIMATIC IT Maintenance program:**
helps customers to prevent unforeseen or unplanned costs for system interventions, composing a maintenance program based on both standard and optional services, with the right balance between predictive, preventive and reactive measures, and based on the newest technologies.

**SIMATIC IT Technical Partner Development program:**
offers a wide range of technical services from presales to product consulting to support of Partner projects in the best possible manner.

**SIMATIC IT Technical Training program:**
consists of a range of training courses providing deep knowledge of SIMATIC IT Products.

The right balanced approach for a complete coverage of the customers’ MES installation
SIMATIC IT integrates Manufacturing Operations into the Enterprise

Built on ISA-95

Four Pillars in ISA-95: Process & Product Analysis

Vertical Integration:
to and from ERP and Control

Horizontal Integration: Product and Production

For all Industries...

...and for all Regions

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SIMATIC IT key benefits

- Integrated portfolio (MES-ERP, MES-PLM, MES-Control, ...) enabling integrated and standardized processes (plant, R&D, HQ...), resulting in:
  - increased performance/flexibility and cost reductions
  - increased brand value/quality and faster time-to-market
  - better visibility/transparency
- Optimizing market responsiveness
- High level of scalability
- Real-time capabilities and broad range of functionalities
- Highest availability of the production system
- Optimization of system reliability
- Faster Return on Investment (ROI) and lower Total Cost of Ownership (TCO)
For more information, please visit our website:
www.siemens.com/simatic-it

For more information, please contact:
marketing.simatic-it@siemens.com

siemens.com/answers