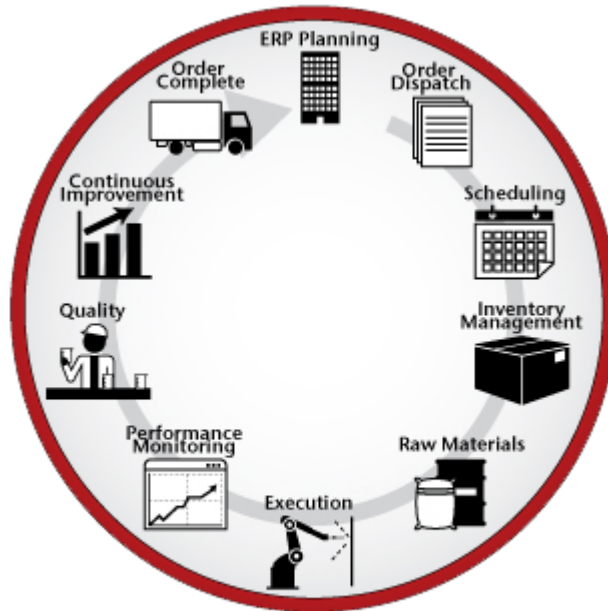# Manufacturing Execution Systems (MES)?

In its simplest form, MES links business systems such as ERP with real-time operational plant-control systems such as PLCs. With MES, the manufacturing process becomes information driven - this info can be used to trigger actions or 'execute' operations, activities, rules, etc.

Typically, our customers have a number of stand-alone databases, legacy MES systems, Excel spreadsheets, or ALL OF THE ABOVE, and want to move to a more integrated, holistic solution that drives business value across their enterprise.

What is MES Software?

Bring order to just about any industrial operation – from localized production cells to full-scale enterprise integration. Replace disparate applications or manual methods with a single, easy-to-use work order execution engine. Your teams can access job schedules, bills of materials, product specifications, work instructions, inventory utilization, product genealogy, material traceability and all other key production elements - in action, in consort and in context.

Manage work order execution, enforce products build to specification and capture all execution detail and material flow information in real time on the shop floor.

Such coordination can increase efficiencies, reduce errors, improves quality and increase product yields dramatically. Inventory turns faster, production lead times shrink, new products get to market faster and much else.

"If you build it, they will come," is not a quote about manufacturing, but the concept is related. MES software manages operations on the shop floor. The scope of MES can vary from scheduling a small set of critical machines to managing the entire fabricating operation for a manufacturer. In all but a handful of cases currently, the MES does not directly control a machine but rather tracks the work-in-progress on the shop floor.

MES is a subset of enterprise resource planning (ERP) systems and executes the plan determined by the manufacturing resource planning (MRP) system. The functions of MES programs include: compiling a bill of materials, resource management and scheduling, preparing and dispatching production orders, preparing work-in-progress (WIP) reports, and tracking production lots. Advanced systems will also have a product definition library with revision history and can report on production status to an ERP. In contrast, an MRP system sets the production schedule, determines the make versus buy list, and determines inventory requirements.

The MES is responsible for scheduling and tracking each step of the production phase of a particular job. It integrates the bill of materials data that the operator will monitor production steps to complete at each phase of production. It repeats this process for each operator and each step until a particular job is complete.

MES is not generally effected by a manufacturer's mode, be it make to stock (MTS), assemble to stock (ATS), assemble to order (ATO), make to order (MTO), or engineer to order (ETO). This is because by the time the MES is invoked, the parts and schedule are already set, usually by the MRP system.
MES is generally installed on-premises, but cloud-based solutions are becoming available. The incremental cost difference between having a server for the software is generally minimal. Instead, the benefit of cloud-based systems is the reduced cost for system management; the servers are out of the shop floor environment, can be backed-up and replicated automatically, and do not have to be maintained by trained on-site personnel. Downside is dependable internet connections through multiple ISPs to insure 100% uptime and security of systems is paramount!

Benefits & Potential Issues

- Reduced production order lead times and improved inventory velocity and accuracy
- Improve predictability of order fulfillment through integrated data for optimizing runs
- Reduce time-to-volume for new product introductions and measure, analyze and act
- Lower variance in production results by keeping with specification parameters
- Improved compliance governance and reporting
- Reduced production costs and operation errors
- Improve profitability
- Secure brand mgt.
- Improve quality through consistency with accurate data
- Increased customer satisfaction

Management Benefits to meet their Goals and Objectives:
- *Reduced production costs* by optimizing product runs and work schedules with less changeover time
- *Improved profitability* by increasing throughput, reducing scrap and rework and providing higher quality products
- *Secured brand equity* with fast and effective responses to unforeseen events or product quarantine/recalls
- *Increased customer satisfaction* by increasing transparency in order fulfillment, effective quality documentation and reducing variance in products built to customer specifications/orders

Operations Teams Benefits:

- *Reduced production order lead time* for rapid responses to changes in demand by dynamic allocation of production assets and more granular production planning
- *Improved inventory velocity* through increased visibility into actual material consumptions, movements and inventory levels
- *Improved predictability of order fulfillment* by monitoring accurate 'planned vs. actual' production quantities
- *Reduced time-to-volume* for new product introductions with quick 'change-overs' between products and lines or utilizing possible flex lines or processes in the advent of downtime or increase capacity needs to meet customer demands
- *Lower variance in production results* by improved consistency and QA in operational activities
- *Improved compliance and governance* through complete electronic system records for 'as planned' and 'as built' information

Tracking & Tracing for Compliance Mgt

Gain real-time visibility into the full range of production processes, from production planning and setup to actual execution of operational activities, as defined by a process model. Production managers and planners can build and view material specifications and grades, bills of materials, manufacturing procedures or steps; define production routing; define shifts; and adopt downloaded production schedules received from the ERP or scheduling system.

During production, track real-time and historical material and labor consumption, lots, WIP inventory, waste, yield and finished good totals, along with other important production events. Build a complete genealogy tree for all production activities. Be prepared to manage product recalls or troubleshoot production emergencies. Such deep visibility to all production information frees you to focus on operating your manufacturing facility with maximum efficiency and productivity.

Production Versatility

The ability to capitalize on fast-breaking opportunities is critical in today's volatile markets. This requires knowing exactly what is happening in your facility, what is planned, and most importantly what can happen. Put real-time production information at the fingertips of the people who need it most. So your manufacturing teams have the hard data they need to understand your true capabilities, maximizing improvements, flexibility and responsiveness, to change product runs or lines on demand.

Consistent Processes Products and Quality Mgt

Keeping production runs consistent is key to operational effectiveness. It starts with getting everyone on the same page with the established operating guidelines and procedures. It continues with ensuring that every sees the same bill of materials and material specifications. And is supported by effective team building, detailing user roles, and making sure they are filled with the right people with the right privileges.

Electronic workflow management provides integration of people and systems into operational processes and enforces consistency in operating procedure execution. Workflows can be triggered from planned or unplanned production events to provide notifications and information to the right people requiring a response or decision making feedback as defined in the process specification and business rules. Digitalization of people-based processes provides faster response, increased operational efficiency and mitigation of risks related to manual activities and data entry jobs.

Combining MES and advanced workflow software capabilities offers a "Model-driven," process-centric approach to sustainable enterprise standardization for Manufacturing Operations Management. With our unique modeling and engineering environment, it is easy to adapt templates that address emerging business opportunities and challenges as well as reduce risk and effort in creating enhancements or adapting to individual site needs.

Best Practices in Mfg

Timely and detailed production information enables production teams to measure line performance and refine to perfection. Armed with this information, plant managers can guide their team towards more productive, best operating practices to drive higher levels of plant performance.

Managers and engineers can view and compare the production processes used across their plant or across sister plants to determine which combination of materials, labor, equipment and procedures deliver the best results. Goodbye guesswork; hello streamlined operations.

Scale with Confidence

What may start as traceability solution or performance tracking can grow in functional capabilities as your requirements evolve. This expanded use increases your return of investment over time and limits project risks and budget with a reasonable step by step implementation.

Optional Modules include:

• Bill of Material (BOM) Definition

• Set Up Parameter Management

• Inventory and Storage Management

• Procedural Steps, Work Instructions & Document Management

Available Extensions include:

• In-line quality management and SPC

• OEE monitoring and Asset Utilization tracking

• Business Process and advanced Workflow Management

Contact

Would you like to learn more about INFO Analytics? Please feel free to contact directly:

INFO Analytics – www.myinfoanalytics.com Tel (289) 691-0955

Email: lloyd.rietze@myinfoanalytics.com

INFO Analytics is a team of system integrators, system analysts, BI Business Intelligence data experts, ready to consult & design, deploy your real time ERP, SCM, WMS, CRM, MES, BI & analytical systems & industrial automation software system needs.

Operational excellence begins with understanding your data. You need to capture, store, contextualize, and visualize real-time information and make it available to the right people at the right time to enable the right decisions. Call INFO Analytics today or email us a request to review your needs and operations.