

# THE BENEFITS OF INVESTING IN A MANUFACTURING EXECUTION SYSTEM

## SHOP FLOOR SAVINGS WITH AN MES SOLUTION

Whitepaper



The manufacturing industry is experiencing a reinvigoration in the use of Manufacturing Execution System (MES) solutions as critical business tools. Part of this readoption is due to the fact that MES packages are no longer what they used to be. With an explosion in the number of modules and options available, MES software has evolved into a sophisticated industry solution, both multi-faceted and technologically advanced. But without defined standards, potential customers are struggling to understand the vast variety of MES options available to them.

So what exactly is a Manufacturing Execution System (MES)? For your factory floor to no longer be isolated from the rest of your business, what exactly do you need in an MES? Finally, what is the value of a single version of the truth - How do you justify purchasing an MES? This whitepaper will answer those three questions and set you on the path to finding an MES that fits your specific needs.

### What is an MES?

A Manufacturing Execution System monitors and manages your operations and the work in-progress of your plant floor. A good MES will offer reliable, two-way real-time data exchange between your machines and your software to guide, trigger and report on plant activities. Ultimately, a MES supports real-time, proactive decision making through operator support, planning and scheduling, resource management and accurate realtime production visibility. Some of the core functionality that an MES could offer includes:

- **Business Activity Monitoring**

Use an event-based notification system to capture and evaluate data for proactive decision making and timely corrective actions.

- **Business Intelligence**

Leverage the data collected by your MES to bring Overall Equipment Effectiveness (OEE) data and Key Performance Indicator (KPI) reporting and analysis to your fingertips for informed decisions.

- **Document Control**

Conform to strict industry requirements while maintaining all pertinent external and internal documents for complete control of the entire lifecycle of your documents. Make quicker, more informed decisions with workflow-based routing and approval tools.





- **Inventory Management**

Simplify and improve inventory transactions, from the warehouse to the production floor to the shipping dock for maximum accountability and total inventory control, including:

- **Barcoding and Labeling**

Easily scan materials as they go in and products as they go out for accurate inventory control, detailed lot traceability, complex labeling and flexible barcoding.

- **Capacity Planning**

Maintain lean inventory levels and manage all aspects of manufacturing demand with Material Requirements Planning (MRP) tools.

- **Maintenance, Repair and Overhaul (MRO)**

Establish a complete preventative maintenance program for your machines, tools, auxiliary equipment, gages and more to eliminate scheduling conflicts and unexpected downtime.

- **Planning and Scheduling**

Incorporate all your scheduling requirements and objectives into one central engine that optimizes your schedule and meets your lean business objectives.

- **Quality Management**

Manage critical quality aspects such as audits, parts and equipment parameters trending out of specification and end-to-end part visibility with a comprehensive quality management system.

- **Statistical Process Control (SPC)**

A subset of quality, SPC can allow you to track, maintain, measure and perform calibrations to assure consistent quality and continually improve.

- **Real-Time Process Monitoring**

Continuously measure equipment capability and correlate process parameters to your products in real time.

- **Real-Time Production Monitoring**

Immediately track and report your results as parts are being made, including overall enterprise efficiency or specific work center performance for ultimate shop floor control. Capture material and process traceability for your products

- **Time and Attendance**

Streamline and track the clocking in/out of employees and relay labor reporting directly into your financial system.



## WHEN PURCHASING AN MES, WHAT SHOULD YOU LOOK FOR?

After reviewing the functionality above that an MES package can offer, you now understand the breadth of valuable information that can be gathered from your shop floor. So it is time to begin researching MES software. On a grand scale, there are three main general attributes to consider when evaluating how an MES package compliments your business and tech requirements:

- Quality of the software system
- Fit to your industry-specific requirements
- Flexibility to adapt to necessary changes in your processes

On a more singular level, how do you know which specific features you will need? What are some other key options that you should ensure an MES vendor offers to guarantee you are getting the best MES package available?

In today's MES world, manufacturers have a lot more choice when deciding what they want in their MES package. What was once designed to monitor a single class of machines can now manage your entire shop floor. When considering MES offerings, look at what comes standard with the core. Most MES packages are designed to work intimately together, so you need a specific set of modules to allow for inventory, scheduling and production monitoring. But can you customize from there? Check out the variety of modules that are offered, paying particular attention to how far the system can reach and whether you are limited in the tools that are available to you. You certainly do not want to invest in an MES package, only to discover that the MES vendor does not offer the quality tools you need and now you need to find a separate quality vendor.

As **mobile** technology continues to pervade the manufacturing environment, consider the level of state-of-the-art technology that the MES software offers. Does the MES package deliver tools and options that interface with today's new mobile technology? Can you perform SPC inspections on the fly? Scan inventory from the shop floor? Accept workflows and approve decisions from your smart phone? MES packages should be designed to keep up with the latest technology so your company stays on the cutting edge.

MES software packages used to operate as self-contained systems, but today are increasingly integrating with ERP software solutions. Good ERP integration occurs when the MES software compliments your ERP software. The two programs should integrate fluidly. You should be able to capture data in real time and make decisions in real time, with all of your critical information flowing easily back and forth between the two programs.

Finally, you should consider the MES software's ability to integrate at the machine level before making a selection. How will the MES package interface with your machines? Does it tie directly into the machine's controller, PLCs or directly to sensors? How about your current SCADA-based (supervisory control and data acquisition) or OPC-based (open platform communications) server system? How does it get that information back to the software for analysis and alerts? Can you get visual aids, like machine status light sticks, to assist in the process?

Before you embark on selecting an MES vendor, be sure to clearly define exactly what you are trying to achieve. That way, you won't miss inquiring about a feature or module that is critical to your success when evaluating packages.





## WHY ARE PEOPLE ADOPTING MES?

You have been convinced. You know adding a standalone MES package to your factory floor will truly solve your challenges. But now you have to convince management that it is worth the investment. So why are people rapidly adopting MES? The answer lies in MES' extensive return on investment (ROI).

You have all this history in your ERP software. But it doesn't help you make decisions based on what is happening on your shop floor right now. If time is money on the factory floor, then ask yourself the questions below regarding better management of your resources and time. Figure out what the savings are worth to you:

- How much money can my company save if I eliminate unexpected machine downtime and dramatically improve uptime of my valuable equipment?  
\_\_\_\_\_ # machine down hours X \_\_\_\_\_ machine cost/hour = \$\_\_\_\_\_ lost
- How valuable is it to my scheduler to have one simple button to push and just a few short minutes later have created the ideal schedule, taking into account priority orders, tooling conflicts, maintenance, inventory availability and shipping requirements?  
\_\_\_\_\_ Time spent creating the daily schedule now (vs. 5-7 minutes with a new MES).
- How valuable will it be to know when a machine is down for scheduled maintenance? Even better, how valuable is it to have my machines properly maintained so they don't go down unexpectedly?  
\_\_\_\_\_ # of unexpected times your machines went down last year (or do you not know?)
- Are you undercharging your customers? How much money can be saved by understanding true actual cost and adjusting your standard cost charges?

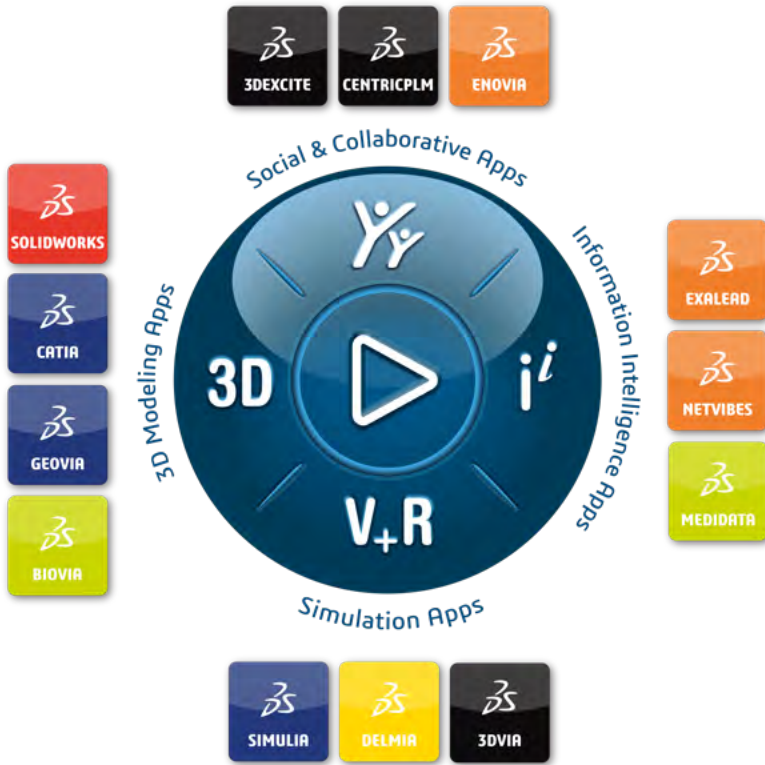


For example, what if \$1.25/part is your actual cost of a product and \$1.15/part is The standard cost you are charging. Who is eating that difference? Do you even know if you have a variance?

And those are just the quantifiable questions. What about the savings that don't have a monetary value assigned besides time, quality and customer satisfaction?

- What is the value of being able to predict and detect deviations in equipment operating parameters and parts before they become quality issues? How many parts will you produce incorrectly before you can get to the potential root cause and develop corrective or preventative actions?
- How valuable would it be to know the actual time (cost) it takes to make your product by having your operators accurately clock in and out of tasks?
- How much money can your purchasing department save by being able to bulk purchase inventory materials accurately?
- What is a 99 percent on-time shipping record worth, with no reshipments?
- What is it worth to not have the FDA or NHTSA on your back as you have full product lifecycle traceability to meeting stringent compliance mandates?

These questions are just the beginning. So many more savings can be uncovered with the right tools. Stop saying, "There has to be a better way." An MES can offer a single, reliable version of the truth and provide a full orchestration of your resources. Your shop floor no longer needs to remain isolated and disconnected from the top floor. With the advice in this paper in mind, begin researching standalone MES solutions today. You will be glad that you did!



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