

Where Does Smart Manufacturing Fit, on the Road to World-Class Manufacturing?

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Smart manufacturing is about the equipment telling us what will work better, not about us turning dials to tell the equipment what to do.

(IW - Andrew Waycott: 3-9-16) Smart Manufacturing is new to us. But World Class Manufacturing has been with us, at least in concept, since manufacturing began. It's only the definition that keeps changing.

In the late 1700s, General Jean Baptiste Vaquette de Gribeauval suggested that musket manufacturing might be faster and cheaper if muskets were made from ... wait for it ... interchangeable identical parts. What a concept!

Until then, each musket was made in full by a skilled machinist; each newly-created part had to be fashioned to fit the eccentricities of its previously-made counterpart. But by 1803, mass production with interchangeable parts had been achieved at Portsmouth, for the British Royal Navy. A new era of World Class Manufacturing (WCM) had begun.

Just as the French general's idea moved the standard of the day for WCM, so has Smart Manufacturing raised the bar today. What was not possible decades or even years ago is today increasingly necessary. Smart Manufacturing? It raises the bar, enables manufacturers to move further down the path to World Class Manufacturing.

The data tell the story

What is Smart Manufacturing? One could argue that it's technology-enabled manufacturing, but that begs the question of what 'technology' means. I think Smart Manufacturing takes a sharp turn away from what the equipment is doing, to what the equipment is telling us. It no longer focuses on us turning the dials in order to

tell the equipment what to do. It's about the equipment telling us what will work better.

The data tell the story that's the endgame. But how do you get there? It depends where you are now.

Let's discuss two broad scenarios—for those with older machinery who've yet to set out on the path, and those who have already made a start.

Scenario 1: I've got a traditional factory and old machinery—now what?

One major boon for manufacturers with investments in aging but still operating machinery has been the plunging cost of sensors. Only two decades ago, it was a handful of bold early adopters who were willing to invest hundreds of thousands to connect the sensors and controllers and analyze the results. Most, understandably, didn't.

Today, retrofitting sensors to older machinery is surprisingly doable. And because WCM is a journey rather than an event, it's possible to be successful adding one sensor at a time.

Start now.

Scenario 2: We collect digital data, we have a data historian - now what?

Maybe you've been collecting data electronically for years. The question is, what are you doing it for? And what do you do with it? Do you use it chiefly for record-keeping and compliance? Have you used it aggressively to, say, decrease downtime?

The greatest joy of digital data is the ability it gives you to objectively discover what warrants attention. To focus on what matters. Rather than noise.

This is increasingly true over the past 10 years. Sophisticated software has finally managed to catch up with the flood of data, find meaning, and, as times goes by, leverage that meaning. Find the critical bottlenecks where a new solution can make

a real difference, and make that solution happen.

All scenarios: The path to Smart Manufacturing runs through MES

Smart Manufacturing starts with a Manufacturing Execution System (MES). That means:

- Collecting a broad array of data from your plant floor machinery,
- Analyzing the data to identify issues and money-saving opportunities—driving fundamental operational improvements,
- Shaping those insights into always-visible, actionable information for your line managers. These people need to know, at a glance, the single best thing they can be doing right now. All day long.

To raise the bar further: Smart Manufacturing also is about logistics and the supply chain. In theory, a Smart Manufacturer can receive an order for 100,000 parts and automatically route that order to a number of plants in a range of locations, and have the order fulfilled in the most efficient way possible.

Today's reality

Not every operation will need to revamp and upgrade to attain the above giddy levels of digital automation. However, even the 'little guy down the road' will need to be able to fit into the advanced systems of his larger neighbor, in order to receive and fill his neighbor's outsourced orders.

Day by day, the world of manufacturing is getting Smarter ... raising the bar on the road to World Class Manufacturing.

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