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Back to the Basics with Digital Manufacturing

MARKETING EFFORTS around artificial intelligence (AI) have become increasingly misleading, promising revolutionary advances for everyday tasks. It seems that a new product with a touchscreen and a cheap widget powered by an online chatbot is released daily. One could reasonably believe that a mobile phone attachment will be capable of autonomously scrambling eggs within the next quarter.

While it's true that in extremely well-controlled environments AI and automation can reduce the need for human operators, this is neither the best use case nor the right entry point for small- and medium-sized manufacturers (SMMs) that make up the largest category of American manufacturers.

Digital manufacturing technologies should be implemented to support skilled technicians in fabrication operations, not to remove them from the equation. At the core, connectivity can help with the basics of manufacturing, such as cycle time and quality control, while providing an easy on-ramp for SMMs looking to improve operations.

Make no mistake, specifications for digitally driven manufacturing operations are coming. It doesn't take a crystal ball to see that OEMs will soon request process information and even repair history of components that they accept from suppliers.

This could roll out over time, starting by prioritizing select suppliers based on the amount of information they're able to send, then eventually becoming a requirement for all suppliers of critical components.

Getting Started

However, implementing basic digital technologies can be far easier and cheaper than it seems, and you don't need to be a computer expert to get your feet wet. It's best to start with a simple problem to find what works for your team.

In September, companies will demonstrate the next generation of digital manufacturing products at IMTS. This is a great opportunity to see what's possible and practical for a job shop of any size.

Keep a few key questions in mind when evaluating the right first step, such as:

- What are the pain points in operational workflow?
- Are there simple measurements around a key process that could reduce downtime?
- Is there cycle time, stock inventory or tool usage information that could help plan a job?

Aim for a simple measurement that would provide actionable information. Basic connections can be made for creating a control chart on critical dimensions or checking run time for a bottleneck process. Involving operators and technicians can help identify operational challenges, while gaining critical buy-in for adoption and continued use of digital tools.

While initial digital manufacturing platforms leveraging MTConnect or OPC-UA required a user to conform to custom, proprietary cloud platforms, companies now can produce plug-ins that work with Microsoft Excel and Google Sheets. Cloud connectivity removes the need for capital investment on new computers or networking infrastructure, but it's possible to store run time information and process measurements completely on-site with a single, existing computer. Naturally, cybersecurity concerns should be acknowledged and Manufacturing USA Institutes such as CyManII and MxD are uniquely positioned to help SMMs handle those challenges.

At Georgia Tech, we teach students that rapid iteration is the key to success. Learning to use digital manufacturing technologies is no different, and, thankfully, plenty of resources exist. Tooling U-SME, provides courses for connectivity with exemplar digital manufacturing use cases. Technical colleges are rolling out introductory workshops for local manufacturers. Equipment distributors are also providing increased connectivity trainings for their hardware.

Regardless of the mechanism, you must get started, even at the most basic level of connectivity, to be prepared for the future of the digital manufacturing industry.

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