The Business Value of Cloud-Based MES Technology

Since taking its manufacturing execution system to the cloud, a large EMS provider has been able to achieve new levels of visibility, efficiency and quality.

By Gelston Howell , Member, MESA International, on August 20, 2018

Manufacturing execution systems (MESs) are now well established in many high-tech manufacturing operations and are a topic regularly covered in this column. We've arrived at a point where the foundational technologies of MES, the Industrial Internet of Thing (IIoT) and Industry 4.0 are all more mainstream. Technology is no longer a barrier—the tools are here. It's now incumbent on manufacturing executives to identify the right production and global supply chain problems to solve with these technologies. In this post, I will focus on how one large manufacturer, Sanmina, derived business value from moving its MES platform to the cloud.

Sanmina is a tier-one global electromechanical system (EMS) provider that makes complex electronic equipment such as medical imaging equipment, automotive products and advanced communications technology. The company deals with constant change—shipping more than 230 million products to 300

different companies each year. Sanmina also manages 10,000 suppliers, more than 1.3 million part numbers and 3,000 new product launches (10 per day) in 75 manufacturing sites around the world.

Sanmina has 20 years of experience with MES. Five years ago, the company to its MES to the cloud, connecting its factories and 25,000 pieces of manufacturing equipment to achieve new levels of visibility, efficiency and quality. We've seen significant results applying cloud-based MES technology for high-tech, highly regulated manufacturing environments. Some of the business impact Sanmina has achieved over the past few years with cloud MES includes:

Instant visibility into factory floor fata with a digital twin. With cloud-based MES technology, a manufacturing executive can log on by laptop from any location in the world and instantly see a digital twin of any one of 60 Sanmina factory floors. Sanmina has connected 25,000 pieces of equipment in the cloud, and hundreds of data collection points around the world can be accessed in real time, such as work in progress (WIP), yields, production problems and delivery status. The system can also be programmed to send text or email alerts to anyone in the organization when yield, throughput or other key performance indicators (KPIs) are outside of preset limits.

This real-time visibility not only helps executives more efficiently manage global operations, it also promotes a proactive factory culture. People on the factory floor know that after a preset period of time, out-of-control key business indicators (KBIs) will automatically be escalated to management.

Forced quality framework for error-free production. Some of the most common causes of product recalls for highly regulated industries are due to defective components or operator errors during production. Cloud technology can eliminate these mistakes by creating a forced quality framework. Equipment, materials and worker activity are scanned via barcode and loaded directly into the cloud platform. If the wrong component is scanned during assembly or an operator has not been trained according to the latest work instructions, the system will prevent the next step from occurring until the issue is resolved.

In the event of a product recall, production errors can be isolated without having to pull large volumes of unaffected products from the field. A comprehensive historical record of all operator actions, test data, in-process data and component data is stored and accessible via the cloud. Having this level of historical detail significantly improves quality and regulatory compliance.

We have come a long way over the past five years. Significant results are being achieved using a combination of MES, cloud technology, IIoT and Industry 4.0 practices. Organizations are surprised at how quickly a cloud-based MES platform can be deployed—initial functionality can be rolled out to multiple production lines in six to eight weeks. From a manufacturing and supply chain perspective, technology is no longer a barrier. It's more about selecting the problems that you want to address and choosing the right technology to solve them.

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