Q&A: Pushing the Boundaries of Manufacturing Automation

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1. What, in layman's terms, is PdM?

A quick internet search will return a plethora of detailed definitions of what PdM is and its potential impact on productivity. Many of those definitions tend to over complicate what truly is a very simple concept. Predictive Maintenance is nothing more than gathering information by various means to predict when a failure might occur and prevent or delay that failure by performing maintenance before the failure can occur. It's not rocket science, although in my decades of experience, PdM is much easier defined than successfully executed in today's manufacturing environment. In many cases the real road block to the success of these strategies is the actuality that companies don't use the information gathered to improve.

Another misnomer that delays or impairs a PdM program is in regards to the perceived difficulty, expense and time required for "gathering information." Included within many industry definitions are references to technologies like vibration analysis, oil analysis and thermal imaging. I also see references to concepts and systems like condition based monitoring, sensors, CPAS and wireless communication networks. All valid technologies and concepts that in many cases, are required to get to the Holy Grail of zero maintenance related down time. But in many cases, we overcomplicate these strategies and don't consider the reality that eyes, ears and feel can provide more than enough information to foster a basic, yet successful PdM program.

2. How will implementation of technology like PdM and robotics lower costs/increase productivity for CPGs?

A robust PdM program can have a significant impact in reducing the manufacturing cost of product. As an example, I don't believe anyone would argue that a well-maintained machine tool or process line will produce a more quality product over time than a poorly maintained one. It's just a fact that less reactive maintenance as a result of a robust PdM program equates to lower overall maintenance cost, more available production hours and lower costs in spare parts and supplies.

Significant increases in productivity can also be gained with the implementation or upgrading of existing technologies such as robotics. Beyond the much published fact that robots don't take breaks or call in sick, they are incredibly reliable and resilient pieces of equipment. As an example, the leading manufacture of robotic equipment in the world, FANUC, is currently reporting mean time between failures rates in excess of 100,000 hours. That's more than 10 years of continuous operation without a failure. Of course, many factors can impact those rates, including how robust a company's maintenance program truly is. But it's remarkable the abuse today's robotic technology can absorb without impacting production availability.

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3. What types of robotics are hitting the market to improve efficiency in the CPG industry? Is anything in particular standing out on the market currently?

Robotic manufactures like FANUC are continually pushing the boundaries of technology. Today's robots are incredibly fast. As an example, in some CPG related pick and place applications, robots can achieve 120 cycles/minute or more. Integrated scanners and their ever-increasing ability to react to a multitude of variables in the blink of an eye are continually expanding the value robots bring to processes such as order fulfillment, palletizing, de palletizing and packaging. Hugh gains in the area of collaborative robotics and their ability to work jointly with production workers are becoming more and more common place in the industry. In the past, safety concerns limited collaborative opportunities to a minimum. Today's embedded technologies combined with sensors, scanners, dual check safety and advanced control systems have all but eliminated those concerns. In fact, in many cases the traditional fenced in cages and the massive amount of floor space they consumed for robotic applications are no longer needed.

One of the most exciting trends in robotics today is in some of the OEM's efforts to achieve zero downtime. As an example, FANUC's latest robotics control systems are automatically collecting real time performance and maintenance-related data and uploading that data to the cloud every 90 seconds. The OEM's software systems are continually monitoring the incoming information and using that information to predict potential failures. Not only potential failures related to the robot, but end of arm tooling and 3rd party devices are integrated into the controller as well. Robots predicting failures weeks in advance, checking OEM stock, shipping a replacement part to the end user and preparing to work order is reality. I remember when we celebrated a robot actually running a complete shift. Those days are gone forever.

FANUC CR35IA Collaborative Robot

What other industry experts say…

"Artificial intelligence, Internet of Things and 3D printing will be the biggest manufacturing/utilities/services sector game changers in 2017. By 2035, the mass adoption of artificial intelligence and robotics will "double economic growth rates and boost productivity by up to 40 percent."

—Tom Roche,
Managing Director of Manufacturing,Utilities and Services Sector, Fujitsu