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How the Industrial INTERNET OF THINGS Is Shaping Manufacturing

by Chuck Wallace

Potential for IIoT in Manufacturing Is Huge

The manufacturing world is an asset lifecycle of Design > Operate > Maintain > Retire. Historically, companies focused on the design and maintain phases, but information from the operations realm, namely distributed control and the operators' rounds, wasn't being intelligently integrated. Now, with the IIoT connecting everything more seamlessly, companies are starting to deeply focus on the operations component to tie it all together and improve overall system reliability.

Machine learning is improving asset reliability from the way manufacturers operate their production lines to the optimization of their assets' lifecycles. For example, the IIoT makes it possible to analyze two years' worth of online data from a 25,000 horsepower compressor system and predict the parameters that will keep it reliable. Laser scanners and 3-D software allow you to scan a problem part from a production line and redesign it to make it stronger and work better in the line with twice the working life.

In this unpredictable world, various companies, such as those that specialize in purpose-built robotics or provide supply chain as a service for maintenance, repair and operations (MRO), are helping organizations create predictable value. These companies are taking advantage of the IIoT by finding patterns in the data and turning them into actionable information to either predict problems or solve problems in a new way.

But the data usage technology itself isn't necessarily new. For instance, some companies have had demand compression algorithms built into their intelligent industrial vending systems for over a decade. These algorithms render the traditional min/max replenishment systems obsolete since they fall short on spiky demand cycles that are so difficult to manage. They use trend multipliers that accommodate lead time variances to recalculate and recommend new reorder quantities and points. There are a number of other ways the system can analyze demand and predict where it should be setting its reorder points. These systems are also adaptive to line changes, with cellular systems making adjustments based on usage and production requirements.

The big advantages of this big data are:

- Reducing inventory by 30 percent;
- Eliminating stockouts;
- Ending the dead on arrival inventory that happens because the needs of the manufacturer change so rapidly;
- Moving away from the guessing game of min/max.

With all the technology out there, all talking to each other, the world is increasingly becoming more and more connected – indeed, flat. The Industrial Internet of Things (IIoT) seems like a nebulous concept that encompasses everything from machine learning and robotics to drone delivery systems and intelligent point-of-use vending. There is more information available than ever before, but making sense of all this data can be daunting. This article will help bring clarity to how the IIoT can enhance all aspects of manufacturing.

What's Inhibiting Progress?

If the technology is out there, why are manufacturers still experiencing downtime and stockouts of critical spares? Technology is like a wave. It takes time to ripple through manufacturing. There are always innovators and early adopters of technology, but the majority of people like to wait and see how it plays out. And, of course, there are always the laggards that will only shift their way of doing things when the old way is no longer available. How many people still have flip phones and are pressing the number nine four times to type a *Z* in their texts?

Innovator and early IIoT adopter Steve Pixley sees this every day with his machines. He founded a company that builds purpose-built robotics that speed workflow, cut costs and give manufacturers better control over their indirect materials in the harsh environments of the manufacturing world. Often, Steve is asked to disable some of the predictive technology in his systems – the equivalent of using a super computer to do basic addition. In the age of Google™, people have less and less interest in mastering the technology or even understanding it. They want the answer or the process and they want it immediately. They don't want to have to think about it again until they need it. But, without an understanding of how the technology works, they can't really tweak it to make it work best for them.

Training and education on technology and processes will go a long way in user adoption as people realize the aim is not to replace operators or maintenance mechanics, but rather to empower them to do their work better and make their company more competitive on a global scale.

Aside from the rate of technology adoption, nobody is really integrating what the operators do on the production floor with the actual needs of the equipment. Shifting perspectives from focusing solely on maintenance to reevaluating operations' impact on the assets will move the needle even further. Now, more than ever, understanding how organizations can operate to best optimize the lifecycle of their assets becomes an important question.

The Possibilities Are Endless

The future will see production schedules fed back into the demand process, anticipating the next week's needs and adapting supply, not only in vending, but in supply chain management in general.

It's clear that point-of-use technology will advance further in the next few years as information becomes even more integrated and actionable. These intelligent systems and machines can analyze data and adapt to it.

Yet, whether talking about intelligent vending or machine learning, there is one common theme. These intelligent systems are only as good as the intelligent humans that input all the variables, monitor the systems and configure them to adapt to their needs.

With an increased focus on the *operate* component of manufacturing, operations will become so steady that eventually parts will rarely fail. Operations will know there's a problem before it happens and will be able to act so a failure never occurs. Spares will be dispensed for planned maintenance projects only and unplanned downtime will be a distant memory from another era.

The chief enablers of the IIoT will be mobile technology and machine learning. New technology always exponentially increases the degrees of freedom and organizations, with the help of specialized service providers, will find ways to use it in ways never thought imaginable!

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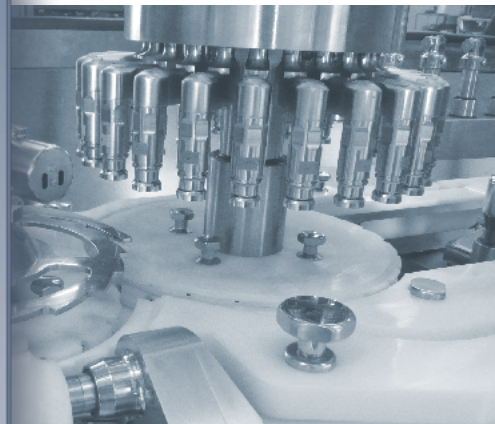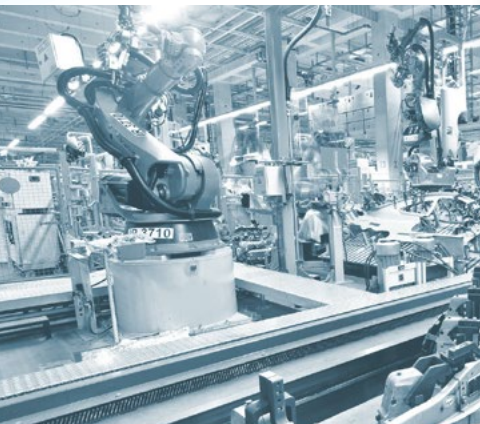
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