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Sorting out the Internet of Things and the Rest of the Buzz ★

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As always, there's a lot of hype surrounding new manufacturing technologies and industry initiatives, ranging from Big Data to Industry 4.0. In this article, we'll focus on what you need to know to determine the opportunities and threats that come with each of them.

Enlarge

The Internet of Things (IoT). Big Data. Cloud computing. Industry 4.0. If you're remotely paying attention, you've seen a barrage of articles on some or all of these topics. And if you've been around the industry for more than a couple of years, you've seen each of these coming for a long time. Essentially, they all entail a lot of devices networked together, a lot of data available to do things, and deciding whether you store your data and do your computing on the computer next to you or use a server located somewhere else.

The bottom line is that the supporting technologies behind all the buzzwords are already available. So let's tackle these topics one by one.

Internet of Things *aka* IoT

The IoT is about a lot of devices networked together. From automotive plants with 8,000 devices on a single network to consumer products plants with 12,000, the benefits of networking these devices include managing everything from anywhere, reducing complexity and hardware costs with one network technology, moving control and information at will, and expanding it all easily. The challenge is in learning the new technology and understanding how to carefully design for systems that dwarf even the largest fieldbuses.

As the IoT concept continues to develop, vendors and standards groups will take care of the hard stuff. The technology will evolve to accommodate the growth—more wireless will be added, everything will be made more secure, higher levels of network traffic will get managed, and more IP addresses will be created. When all is said and done, you'll be able to continue as before, just with a few more zeroes in the number of devices on your network. Ultimately, however, it will be up to you to decide how your company can operate differently when virtually anything can be on your network.

Big Data

Big Data is about having a ton of information to use. Ten years ago, manufacturers recognized they could and should store production data and, in response, they added storage space at an alarmingly fast rate. Now that all this data is at hand, more than one manufacturer has been known to say: "We're collecting everything, but we aren't really using any of it; and we aren't sure what we should do with it all."

This trend continues today, but with software that knows how to analyze and help you use that data. Some of the best technology is derived from search engine and web companies, like Google and Amazon, that measure, interpret and record every twitch their users make. Vendors will continue to make data transport and storage bigger and faster, and will keep creating software to help you use the data. Your decision is how to connect the information "gold" in your hands to your company's business challenges to see new opportunities to gain efficiencies, insight, speed and competitive advantage.

Cloud Computing

Cloud computing is about storing your information and computing power somewhere other than the computer next to you. Today, most see cloud computing as an opportunity to gain more computing power and storage space, while reducing the overall cost of maintaining and managing IT equipment and software. They also see new ways to collaborate with others.

While the computing aspect of cloud computing has a ways to go to become truly viable for the industrial space, storage is coming on strong as an easy way to back up and share data. Like the IoT and Big Data, vendors will handle the technology issues here as well. Your job is to assess the benefits and risks of having your critical data available and secure when it is located and managed by someone else, somewhere else.

In the industrial world, we define "real-time" and "mission-critical" different than the IT group, so our comfort level with what and how the cloud can work for us may vary dramatically. Proceed here with caution. Once satisfied, however, you can determine how your company might benefit by having virtually unlimited computing power, storage and, eventually, new avenues of collaboration.

Industry 4.0

Industry 4.0/Manufacturing 4.0, which originated in Germany, is about strategic use of smart devices. As a frame of reference, consider this: In the 1990s, a photo eye was available that held more than 30 pieces of information when networked on DeviceNet. About the same time, variable frequency drives (VFDs) and motor starters that once had only a few analog and digital signals tied in with their power began to share hundreds of pieces of information when networked.

The point here is that the technology behind Industry 4.0 isn't new; what's new is that the concept of Industry 4.0 is being used to drive an industrial revolution around actual use of the wealth of information enabled by smart, networked devices in new and innovative ways. The initiative is challenging you to capitalize on the innovation that's possible today.

Poised to Take Advantage

Given that the supporting technologies behind all these futuristic industry concepts are available today, the question is: Are you ready to take advantage of them?

Like the Good Witch tells Dorothy in *The Wizard of Oz*, "You've always had the power to go

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back to Kansas"… or, in our case, take full advantage of IoT, Big Data, cloud computing and Industry 4.0. Instead of clicking your heels together, the steps you need to take are:

- Move to a well-designed network infrastructure that lets you scale-up dramatically, easily and reliably. If you're like most, you've been moving to industrial Ethernet and away from fieldbuses. You've found Ethernet to be big, fast, and pretty forgiving. Chances are, however, that your network has grown ad-hoc but just keeps working. As your network grows, you'll need to evolve to a design that includes segmentation, security and redundancy in the right places, along with easy network management and expansion. (For more information on turning your ad hoc network into a real infrastructure, follow this link: http://www.automationworld.com/heres-your-sign-it-may-be-time-turn-your-...).

- Expect cost savings, and use them to justify your actions. You won't need to work very hard to find huge productivity gains through reduced training and spare parts, less need to train everyone on multiple network technologies, and faster response times from using one technology.

- Think big thoughts—way beyond cost savings, or your department or job function. If your company could have ultimate intelligence, in the blink of an eye, from anywhere in the world with the ability to change what you're doing or how you're doing it on a dime, what would you do? Take whatever you're thinking about now and think exponentially bigger. If you're not that kind of thinker, grab some people who are, take them out of their current box and get them to think the big thoughts. Once you've thought "big enough," make a list of the challenges and sort those out. I'm betting the number of organizational, logistical, and cultural challenges outnumber the technical ones. If you'll think a little longer, you can find solutions or workarounds to all of them.

- Determine how to do them today, who needs to buy in, and the help you'll need … then go line them up.

The bottom line to realize here is that the IoT, Big Data and the rest are just enablers to help make your big ideas possible. As you take the first steps by improving your network infrastructure design and adding smart networked devices, more computing power and space … shop wisely and tie your investments to specific goals that will result in cost savings and a big upside.

As one of those vendors who needs to keep up with the incremental growth in devices, data and computing, Belden is ready. We've been innovating in the standards community and with our own Hirschmann, GarrettCom, Lumberg Automation, Tofino Security and Belden brands to bring you great industrial products and features. We're the ones that delivered zero-loss wireless roaming; Clear Space® industrial wireless noise elimination; IP-67 rated on-machine Ethernet switches, connectors and cord sets; the ability to commission 1,000 or more switches in two minutes or less; and physical media with noise immunity and environmental certifications for nearly every industrial and otherwise demanding application.

We'd be happy to review your situation and provide free advice for improving or creating an industrial network infrastructure that will meet your needs both today, and in the future.

We're ready… are you?

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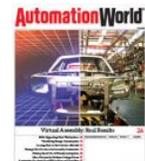| Enter your email address here | **SIGN UP** |

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