THE EVOLVING AUTOMATION ARCHITECTURE

The Internet of Things is driving analytic advantage – is your plant ready?

A Cisco Consulting Services Study from 2014 found that 86% of manufacturers are investing in the Internet of Things (IoT) as they go after an estimated $4 trillion in benefits for manufacturing applications.

Why now? The cost of sensors, networking, storage and computing has dropped dramatically. New architecture models and technologies have emerged that ease deployment and accelerate time to value. Operations can increase overall equipment effectiveness and create new value through insights culled from existing control systems and by adding new sensors to track asset health and processing conditions.

Traditional automation architectures will continue to evolve to make machines and process skids grow smarter. However, there is a complication: These equipment assets need to be connected to the plantwide enterprise to unlock data and allow for wider scale and more innovative analytic approaches. This plantwide network fabric is critical for advancing IoT.

Meanwhile, new approaches to acquiring sensor data through wireless mesh networks have been developed. These sensor networks do not connect directly to critical automation control systems but instead connect to computing resources close to the edge and to private/hybrid cloud resources. These new network architecture models advance what we can collaboratively achieve as end users and vendor communities.

What is the key to faster and larger return on investment? It lies in leveraging reference models, architectures, and ecosystems to go from opportunity assessment to pilot project to full-scale value creation. The exciting part about these new IoT approaches is the potential to innovate on an ongoing, sustainable basis with access

to deeper, richer data and more powerful, flexible data analytics for system-level insights. Let's look at three key areas to grow your IoT architecture.

Connecting Plant and Enterprise. A foundational IP network fabric that follows a validated architecture with security and scalability will enable the connection of people, processes and technology. This requires collaboration between IT and OT to execute. Maturity models

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exist to help frame the task at hand. A holistic architecture provides the power and flexibility to take advantage of innovations in sensing, computing, and mobile data access that are transforming value creation. Use the Converged PlantWide Ethernet (CPwE) architectures to provide the foundation for connecting the plant floor to the enterprise with defense-in-depth security, including an industrial demilitarized zone (iDMZ).

Scaling sensors with wireless mesh networks. Emerging wireless mesh solutions that connect to the IP network fabric provide the ability to cost-effectively deploy many wireless sensors across a plant floor. The inherent robustness, flexibility, and ease of deployment can be real game changers when calculating ROI or return on assets. The ability to cost-effectively add more sensors on desirable

SUPPORTING VIDEO:

Panduit's Jack Tison discusses the evolving automation network architecture, and how IT and OT are converging on the plant floor to help organizations stay competitive in the age of the Internet of Things (IoT):

http://plnt.sv/1504-az

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variables can provide predictive diagnostics and system optimization inputs that could only be dreamed about in the past, without requiring rip-replace or risking complications to existing automation systems and networks.

Computing at the edge. Analyzing data close to the machine or process is not a new concept, as evidenced by the continued success and evolution of industrial controllers. For IoT, the need to process data in industrial real time means that latency must be reduced in the computing and storage strategy for data from new wireless sensors and other new connected assets such as video. The approach of sending all data to a public cloud for processing may not prove timely enough for most manufacturing environments, to say nothing of the bandwidth and storage issues as well as costs that this may generate. Thus, intelligent gateways and routers can provide computational services that enable local real-time decision-making capabilities.

Consider how you will assess and explore these new models and technologies in order to innovate and compete. Market leaders have started down this path already, so you will not be alone. Great ways to start include obtaining education and training from organizations such as the Industrial IP Advantage (www.industrial-ip.org), becoming involved in organizations such as the IoT World Forum, and developing your own proof of concepts of these emerging models with ecosystem partners. Manufacturing is changing rapidly and will never be the same so the time to act is now. ⦾

Jack Tison is SVP of emerging business and former CTO at Panduit, a developer and provider of leading-edge solutions that connect, manage, and automate the physical infrastructure. Panduit is a founding member of Industrial IP Advantage (IIPA), which provides thought leadership on how manufacturing and industrial companies can build more successful businesses by deploying a secure, holistic digital communications fabric based on standard, unmodified use of the Internet Protocol. Discover more at www.industrial-ip.org.