Smart Factories: a Symphony of the Industrial Internet in Action

As the world of traditional manufacturing fuses with digital manufacturing, organizations are tapping into a level of technical orchestration never attainable before. Symphonies of systems facilitate real-time interactions between machines, assets, systems and things. This is the Smart Factory; the factory of the future. It's conducted by the Industrial "Internet of Things," permitting processes to govern themselves, with intelligent machines and devices that take corrective action to avoid unscheduled breakdowns. Downtime becomes a thing of the past, waste and defects eliminated, each machine moves in perfect time. Every handheld digital device in the factory reports the status of every fixed device, giving personnel access to real-time, actionable information. Wearable technology tracks employee location in case of emergency. A global team of tech-savvy players will ensure that specific parts are ordered and replenished based on real time analysis of big data. The list goes on and on.

While the Internet of Things (IoT) has become everyday jargon, how does it relate to Smart Factories? And how is the Industrial Internet differentiated? It's simple – the first industrial revolution was powered by steam. Today's Industrial Revolution is being powered by the Industrial IoT. What are these "things?" They are an assembly of sensors and controllers, devices and embedded components, all talking to one another – interconnected, machine-to-machine, in real-time – the entire factory moving and producing in harmony. This is the Industrial Internet, Industry 4.0 and the Industrial Internet of Things (IIoT). When all of these things come together, the benefits and outcomes are extraordinary.

Empower Decision-Makers with New Insights

Smart Manufacturing takes the focus off what the equipment is doing and turns the focus onto what the equipment is communicating. Steps to capitalizing on this new knowledge:

1. Collect a broad array of data from your plant floor machinery
2. Analyze the data and use it to identify parts failure, end-of-life or performance issues and time-saving, money-generating opportunities
3. Turn these insights into actions

Technologies like Big Data and Cloud Computing will provide useful insight to the factory management, increase productivity, quality and flexibility within the manufacturing industry. Of course the data has to be stored and processed with advanced tools to generate meaningful information. Flexible, scalable clouds of cost-effective storage catch the outpouring of data. Then sophisticated software tools are applied to analyze the results and empower decision-makers to turn all of this into actionable insights.

Prepare for Digital Automation

What if you have a traditional factory with old machinery? Start retrofitting. In previous decades, it was only the manufacturing industry giants who were willing and able to make the necessary investment to purchase and connect sensors and controllers and analyze the results. Today, the cost of these devices has plummeted, making it possible for every operation to revamp, upgrade, retrofit, and prepare for digital automation. The process to becoming a Smart Factory is a journey.

Recognize the Benefits

Companies like Bosch, National Instruments, Cisco, TechMahindra among many other Industrial Internet Consortium Member organizations are deploying an IIoT Smart Factory strategy and realizing these benefits:

- Increased Shop Floor Visibility: insight into the production floor enhances quality control, tracks equipment wear and tear, optimizes repairs and other schedules and addresses issues before they occur.

- Intelligent Supply Chain Management: sensors such as RFID tags allow inventory tracking and monitoring, and process automation.

- Decreased Total Cost of Ownership: enabling smart grid technology optimizes power consumption, IoT-enabled HVAC, and load balancing. In turn, this might inspire natural resource conservation, and effective prediction of future energy requirements.

- Streamlined Human Resources: This doesn't necessarily mean job loss, but more importantly job optimizations. Continuous data means continuous analysis, risk assessment, and process coordination. It also means fewer field service calls, optimized remote monitoring and diagnostics and proactive equipment maintenance and repairs.

- Increased Revenue: All combined, Smart Factory optimizations are leading to better results, new business opportunities, cost savings and increased revenues.

Things are coming together

Just as every masterwork of composers past, the Smart Factory is an elaborate, calculated composition that has been years in the making, and will take years to fabricate, practice and become prevalent. Members of the Industrial Internet Consortium are delivering manufacturing-centric testbeds to prove out collaborative innovations developed across industries and areas of expertise.

Is your organization ready to become part of the Industrial Internet revolution? Visit **www.iiconsortium.org** for information on our activities and membership.

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