PTC and Microsoft: Connecting Business Processes and Applications with the Industrial IoT



The manufacturing world enters the universe of connected things.

The Industrial Internet of Things (IIoT) is no longer a futuristic idea for companies around the world. More and more, it's the way business is done.

The manufacturing sector is no exception. For companies that make parts, components, and other products, the IIoT is integral to creating smart factories that leverage high-speed communication and computing for real business impact. Leading companies around the world are using the IIoT to bring operational technology (OT) and informational technology (IT) together for the first time. By creating a universe of connected things, they are able to:

- Collect and analyze data more effectively
- Optimize their business practices
- Improve their customer experience
- Drive new revenue streams

For companies that manufacture smart connected products for end users, IIoT, through the delivery of real-time performance data, fundamentally changes the ways that products are designed, serviced, supported and sold. Ultimately, the IIoT presents an enormous opportunity for manufacturers—not simply to digitize and grow their operations, but to transform their business. The IIoT enables manufacturers to stay competitive and take full advantage of new and emerging opportunities in the market today.

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The role of lloT in smart manufacturing

The IIoT allows manufacturers to leverage the power of connected things to stay more closely connected to their operations and their products deployed to the field.

Using technologies such as big computing and advanced analytics, manufacturers can better understand equipment or product usage; when and how a part will wear out; and how to optimize equipment to perform better. Add a global cloud platform to the equation, and manufacturers can scale both production and monitoring around the world quickly and easily.

Why lloT matters in manufacturing and why now is the time to embrace it.

The IIoT gives manufacturers a level of access, perspective and knowledge they've never had before. By connecting products, people and things through IIoT technologies, companies can tap into terabytes of data and extract the deep insights they need to:

- Streamline operations
- Make more informed business decisions
- Predict customer preferences and behaviors

Ultimately, the universe of connected things—and the data it yields—gives manufacturers the clear, multi-dimensional view they need to develop high-value service.



The benefits of building a smart factory through the IIoT.

Manufacturers who have implemented IIoT technologies are seeing the impact on their bottom line.

Increased profitability

The IIoT can help manufacturers reduce production costs and eliminate inefficiencies. More importantly, today's leading-edge technology can support an end-to-end approach that drives new business models and revenues. In fact, even companies in traditionally low-growth industries are achieving growth rates in areas of their business that utilize IIoT technologies.

Faster time to market

Real-time visibility into operations provides manufacturers with the flexibility and agility they need to get products to market faster. With direct insight into their systems, manufacturers can avoid disruptions such as unnecessary equipment downtime, giving them the ability to truly maximize throughput. Factory managers can also leverage the IIoT to accelerate decision making and problem solving, which results in speedier production times.

Increased customer satisfaction

Manufacturers must work harder—and do more—to win a customer's brand loyalty. Today's customers expect more from the products and services they buy and are constantly seeking out the newest, fastest, and most cost-effective solution. Through IIoT technologies, companies gain the insight they need to keep pace with customers' changing needs and preferences. In addition, by building on an intelligent, scalable platform, they can create the kind of customer-focused solutions and experiences that drive brand loyalty.

Reduced costs

According to the American Society for Quality, manufacturers that connect devices using the IIoT and analyze the data generated by this connectivity—are better able to reduce overhead; conserve resources; and optimize throughput. In fact, 82% of companies that have digitized their operations via the IIoT have increased operational efficiency and improved product quality (with 49% fewer defects). 82% of manufacturers using IIoT increased operational efficiency and improved product quality.¹

79% of manufacturing leaders already use lloT technology to track customers, products, business premises, or supply chains.²

Industry Week, "How Manufacturers Use loT for Operational Efficiencies" TCS Global Trend Study, July 2015

The enterprise benefits of monitoring smart connected products in the field.

Service optimization

Monitoring the performance of equipment deployed to customers via automatic status notifications can have immediate benefits. By collecting and analyzing the appropriate data sets, service teams can move toward predictive maintenance, where service costs can be significantly reduced. Ultimately, this proactive approach will result in end users never having to initiate service requests since their systems will never be down on an unscheduled basis.

Transforming other functions

Data insights not only enable optimization of service costs while minimizing downtime, but uncover opportunities for sales of new/different equipment and consumables based on usage. This can significantly inform how products are designed and empower advanced, outcomes-based business models such as "Product as a Service."



Connecting business processes and industrial applications: Challenges, risks, and speed bumps.

There's the idea of the IIoT; then there's the reality of implementation. Manufacturing companies may run into some challenges as they ramp up.



Unlocking insights from millions of IIoT devices.

With the IIoT, manufacturers now have millions of devices, machines, products and assets connecting, communicating and producing terabytes of data.

The question is: How do you extract valuable insight from this vast collection of data? After all, it's these insights that allow you to solve problems, drive sales, cut costs and find new opportunities for revenue.

While the IIoT can offer decision makers an exponentially greater volume of data than ever before, dealing with this quantity of data can prove challenging. Decision makers must be able to easily visualize data in order to interpret it and to see what's happening in the factory, in their customers' systems, and why. Effective data visualization requires having the right tools (to transform data into meaningful insights) and the right dashboards (to make it actionable).

Establishing secure bi-directional communication to millions of devices.

Two-way communication and connectivity are critical to the success and effectiveness of the IIoT.

While the ability for connected devices to *send* realtime information provides manufacturers with better transparency into their operations, the ability for devices to also *receive messages* gives manufacturers the power to truly optimize their systems in the most efficient way. For example, IIoT data might indicate that a machine's behavior is deviating from the norm and that it needs service. Bi-directional communication enables the manufacturer to quickly diagnose the issue and avoid the disruption of a potential machine failure, saving them from the challenges and costs associated with unplanned downtime.







Enabling data storage, security and scalability.

The data derived from a smart manufacturing environment is useful in two varied scenarios. In the first, data is available in real-time to enable businesses to respond to developing situations. In the second, historical data is leveraged for problem solving or determining areas for improvement. These two different needs create challenging requirements for data storage. For the IIoT to work at its best, companies need to strike the right balance of data accessibility and security. At the same time, the quantity of data that needs to be stored continues to grow exponentially, making scalability and cost an ongoing concern.

In the consumer world, the hacking of baby monitors, smart fridges, cameras and even the car radio has raised serious concerns about safety in the IoT. These same concerns apply to the IIoT. Millions of devices must be able to send and receive commands, notifications and messages at any time—without opening your company up to security risks.

As manufacturing processes become smarter, the production processes are becoming more tech-driven. Most of the connected machines share information directly to the cloud, which can expose companies to security threats and attacks. In essence, any "thing" or device that is controlled by the network or the internet is at risk.

PTC and Microsoft: Because digital transformation requires a powerful partnership.

To adapt to the world of IIoT, manufacturers need more than technology to help them overcome challenges and risks. They need a holistic, turnkey solution that helps them digitize their operations seamlessly for real business impact. They need providers that have extensive experience running services which span across verticals and geographies, but are also able to scale in a secure and transparent fashion.

Enter PTC ThingWorx and Microsoft Azure—a proven industrial innovation platform with a market-leading cloud infrastructure. By joining forces, PTC and Microsoft leverage each other's strengths to help today's manufacturers realize their unique vision of digital transformation.







PTC ThingWorx: Built for Industrial IoT applications.

PTC provides ThingWorx, a best-in-class industrial innovation solution that helps global organizations capitalize on the value created by the convergence of the physical and digital worlds. Drawing on PTC's domain expertise in the factory, ThingWorx provides the functionality, flexibility and agility needed to develop and deploy purpose-built IIoT applications—faster and more easily. It also contains a broad set of features, including multiple connectivity options to analytics to seamlessly develop compelling AR experiences.

Ultimately, with ThingWorx, manufacturers can create scalable, secure solutions that deliver information and insight in context, improve business decision-making, and deliver a high return on investment.

Microsoft Azure and Azure IoT Hub: Designed to connect, monitor and manage billions of IoT assets.

Microsoft provides Azure, a single, intelligent cloud infrastructure that manufacturers can leverage to more effectively deploy ThingWorx. The Microsoft Cloud infrastructure supports more than one billion customers in 127 countries. Drawing on Microsoft's decades-long experience building enterprise software and running some of the largest online services in the world, Microsoft Azure provides higher levels of enhanced security, privacy, compliance, and threat mitigation practices than most customers could achieve on their own.

The Azure IoT Hub offers a fully-managed service that enables reliable, secure bi-directional communication between IoT devices and ThingWorx by using per-device security credentials and access control.



Smarter. Stronger. Together.

Together, the PTC and Microsoft joint solution helps companies realize a number of business advantages:

- ✓ Faster time to market and faster time to value with the ability to build powerful, IIoT applications and solutions on a global scale
- ✓ Bi-directional communications to IIoT assets—including the ability to send messages to any device and manage machines in the real world
- ✓ The ability to collect and manage data from devices—and to use that data to gain deeper insight into various levels of your organization
- ✓ Improved decision-making via predictive analytics, proactive alerting and actionable recommendations
- ✓ Insights to help enhance and personalize the customer experience to create more opportunities and drive new revenue streams
- ✓ The combined expertise of two industry leaders with over 30 years of proven innovation and the ability to support any customer use case



Colfax: Proof that a powerful partnership connects to results.

Colfax, a diversified and global industrial technology company, offers a compelling example of how to use the PTC and Microsoft holistic solution to achieve IIoT success. Learn how the company is reducing service operation costs; introducing new products to market more rapidly; elevating customer service; and introducing new revenue streams by becoming a smart manufacturer.

Watch the Colfax webinar

"These two industry leaders coming together makes perfect sense. With ThingWorx and Azure, Colfax will be able to capitalize on the opportunities inherent in the Internet of Things, to quickly grow and scale its operations."

RYAN CAHALANE VICE PRESIDENT OF DIGITAL COLFAX



Holistic technology to advance your own digital transformation.

For many manufacturers today, leveraging the power of the IIoT is not a matter of "if," but "when." If your company is ready to evolve and advance, now you have the opportunity to put the power of two industry leaders behind you.

With PTC and Microsoft joining forces, you can leverage PTC's leadership in IIoT, product design, manufacturing and service and Microsoft's expertise in intelligent cloud business— all through one secure, turnkey and holistic solution. Turn the IIoT into a gold mine of actionable data.

Contact us for more information on how PTC and Microsoft can help bring the IIoT to life for your organization.

