



Unlock the Potential of Industrial IoT and Connected Service

The Internet of Things (IoT) promises to connect more than 41.6 billion devices by 2025, but there's more to it than a talking fridge or a smart toothbrush.

To date, the space has been dominated by consumer applications. Yet according to the IDC, it's industrial and medical applications that hold the most potential. So why have these industries been slower to lean into the IoT?

According to McKinsey, concerns that technology will replace workers and the assumption that 100% digital readiness is required are just two of many fears that companies have.

But despite their hesitation, industrial IoT (IIoT) adopters stand to gain measurable impact — they can experience up to 30% revenue growth by implementing connected, smart technologies.

And the opportunity is particularly vast in service, where, even in the midst of a pandemic, just 29% of industrial companies have reduced the need for in-field service by implementing remote, connected monitoring and resolution tools or equipment.

What will it take for the manufacturing, energy and other high tech industries to see the light when it comes to the IIoT? From highlighting the opportunity for improved ROI through reduced downtime, to breaking down the steps to actualizing connected service, we're tearing down the notion that the IoT is a futuristic pipe dream for a handful of big companies. The IoT is here, and it can work for everyone—here's how it can work for you.

Connected Service Delivers Real Impact

The Internet of Things is gaining traction among field service organizations. In 2018, 42% of companies had already incorporated the technology into their businesses, and an additional 31% aimed to do so by the end 2020.

So what can the Internet of Things do for connected service?

The IoT relies on a web of devices, all connected by data that's gathered and shared via sensors. This data provides key insight on how individual devices are performing in real-time and can identify patterns in behavior, which can then be used to deliver predictive recommendations.

With the right automation and analytics technology, companies can map data from their connected devices back to a unified platform and apply artificial intelligence (AI) or machine learning algorithms to deliver predictive analysis. This enables them to anticipate when one of their devices may fail, and proactively automating fixes.

For businesses, the case for connecting their devices to the Internet of Things is clear: they can save valuable time and money by getting their devices onto a network, and servicing them before things go wrong. And B2B companies in the industrial and manufacturing realms have the most to gain.



In the consumer world, a broken dishwasher may cost a business a couple hundred dollars and lead to one unhappy customer. But in the energy industry, a broken wind turbine can cost a business millions of dollars. A single turbine costs upwards of \$1M, and relies on thousands of sensors, actuators, integrating strain gauges, bearing monitors and power conditioning technology.

Monitoring these elements for irregular patterns, diagnosing small errors before they turn into massive outages, and optimizing their performance could prevent downtime not only in an individual device, but also in device families.

If one turbine experiences failure after exhibiting a certain pattern of behavior, chances are another turbine exhibiting similar symptoms may eventually fail, too — technology can identify this risk, and depending on the problem, either correct it automatically or flag the need for field service.

But not all devices are equipped with sensors or enabled with connectivity from the get-go. Older and analog machines have to be retrofitted to not only collect and report data, but also support automation, which can be costly. Still, despite the price tag, it's worth it.

Rob Meredith, Chairman of Bolt Data Connect, says for one client, each minute that a certain machine is not running costs the business \$2,000.

“Connecting your machines to avoid unnecessary downtime and zero dollar truck rolls provides a pretty clear ROI.”

- Rob Meredith, CEO of Bolt Data

Connect the Dots for the IIoT

If there's so much potential for ROI in the Industrial Internet of Things, then why haven't more businesses taken the plunge into connected service?

It turns out that a cost-benefit analysis isn't the only thing that's holding companies back. From having a limited understanding of what AI truly means from the perspective of connected service, to not fully grasping what the connected service use case might be for their individual business, companies are hesitant to make the IoT leap.

Taking the Mask Off of AI

Artificial intelligence and the IoT are increasingly converging, giving rise to a new concept—the AIoT. Simply put, the IoT needs artificial intelligence-powered platforms to analyze data and deliver the predictive insights that can make connected service a reality. But the idea of artificial intelligence (read: robots) scares off adopters that are unfamiliar with it. But in connected service, AI isn't a sci-fi concept—it's straightforward statistics.

For example, artificial intelligence can be applied at a food canning factory, where an assembly line connected to a network by sensors seals food products. If a can moves from point A to point B in four seconds, there's a 99% statistical chance that the machines involved are running properly.

But when that takes seven seconds instead of four to move the same distance, there's now a 64% chance that there's a problem with the assembly line somewhere, Meredith explains. "Something is causing performance to drop. The AI applies algorithms to trends in the product line that will identify the issue and predict failures weeks before it happens," he adds.

Demystifying artificial intelligence, machine learning and other concepts that make proactive, connected service possible is the key role to making this technology accessible, applicable, and simply not scary is the first step towards adoption.

From there, it's critical for businesses to understand how the AIoT and connected service can transform their business.

Finding the Use Case

Even though companies might see the promise of the AIoT and connected service in general, one big obstacle standing in the way of adoption is understanding the value it offers them specifically. Once the mystery of AI that surrounds connected service is removed, businesses can identify their clear use cases.



Actualizing Connected Service

Once the apprehension is gone, a use case is established, and the potential for ROI is clear, the real work of connecting devices and service can start. Typically, the first step that businesses take is to assess where they are along the connected service maturity curve: Are devices online? Are they connected? Where is their data stored? How is data applied and used?

From there, next steps depend on where the company falls along the maturity curve. For many companies, the journey to connected service follows these five steps, assuming a business is starting entirely from scratch.



Step 1: Add Sensors

If existing devices have no means of collecting data, they need to be retrofitted with sensors. Sensors will need to be placed strategically, to monitor key aspects of device processes.

For example, at a printing press, sensors can be placed on the print well line to monitor the vibration of the wheels, collect data on how the wheels are operating, and catch wheels that are prone to malfunctioning. Eventually, systems integrators can help set up your service platform to pull the data from each of these individual sensors and use it to evaluate the overall health of a device, diagnose and anticipate errors, and even automate service (i.e. automatically trigger a parts order when something breaks, for example).

Step 2: Build a Connection

With sensors in place, machines need the ability to talk to their network and connect to the internet. This requires another piece of technology—think of modems, routers, and other tools capable of picking up and emitting Internal signals. They are essential for enabling sensors to transmit data for analysis purposes.

Bolt Data Connect, for example, sets up Edge Gateways, connecting devices through a number of standardized technologies, allowing them to communicate by accepting inputted, outputted or other processed data. Systems integrators can establish this connectivity, enabling data to be gathered at scale and monitored for patterns, all in real-time.





Step 3: Establish a Database

Once devices are connected to a network, they can start collecting and processing data. But before any analysis can take place, the data must be gathered in a database. A database set up for AI analytics can simultaneously ingest, explore, analyze, and visualize fast-moving, complex data within milliseconds—and systems integrators can get this kind of database up and running.

“Our process is we set companies up on a cloud database to house the machine data. When that machine data comes out, it’s just ones and zeros. It is just noise, but we have to capture it all. We also do quite a bit of processing at the Edge. We convert the ones and zeros there, applying computational and alert logic before sending data to the cloud. And then once we have it all in the cloud, we can start analyzing,” Meredith explains.

Deep Dive: What is Edge Computing?

Edge computing is a distributed, open IT architecture offering decentralized processing power and enabling mobile computing and Internet of Things (IoT) technologies. Data processed at the “Edge” refers to data being processed by a device itself or by a local computer or server, rather than being transmitted to a data center.

Step 4: Analyze Data Through AI

With enough data collected over time, an AI-enabled service platform can start to work its magic. This allows the business to orchestrate AI to reach into the database to take those ones and zeros and apply algorithms that make sense of how a device is operating. That involves picking up on healthy patterns of performance as well as unhealthy ones. AI learns to look for abnormalities and diagnose problems.

Now the business is better prepared to determine what it can do with that diagnosis.





Step 5: Automate Based on Insight

Once data is analyzed and AI has learned to diagnose problems based on insight, it's time to automate actions that take place based on specific data indications—and identify the best opportunities for automation. Say a sensor has been monitoring the ink level of an industrial printer, and the AI has learned that once it reaches below a certain point, the quality of the print decreases. What can a business do with that information?

“This is the point where the manufacturer of that printer can say: We don’t need a cumbersome manual process. We can automatically order the replacement part, coordinate shipping carriers, schedule installation service, invoice the customer, and send notifications to provide status updates.”

In this scenario, the manufacturer has proactively anticipated a service need, saving a customer time and money, and providing a better experience. Without connected service, the customer wouldn’t know the printer was about to run out of ink, and would have to spend time troubleshooting. What’s more, any down time while the ink was in route could prove costly. But connecting the process prevented both.

Connected Service is Better Service

The culmination and true promise of connected smart service is a better experience for customers. But when it comes to the IIoT, the stakes are particularly high. From turbines that power factories, to medical equipment that saves people’s lives, the devices that make up the Industrial Internet of Things have big jobs to do—and they can’t afford to fail.

Manufacturers, energy companies and other industries need to consider the difference that connected service can make not only for their customers, but also for their business. From cost savings to happier customers, the opportunity is there—and systems integrators can help unlock it.