eBook

Jumpstart Industry 4.0 with AWS Connected Factory solution

aws

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Modernize manufacturing using data from the plant floor

Manufacturers today only realize 20-30% of the value of the data they collect from their factory and fleet assets. However, modernizing the use of operational and IoT data enables near real-time visibility into operations via dashboards. Using deeper analytics, like ML/AI, they could reduce product development costs up to 50%; reduce operating costs up to 25%; and increase their gross margins by 33% or more, extracting up to five times more value overall.

In order to improve visibility at all levels of their business—enterprise, plant, line, machine, process, and product—manufacturers need a solution that combines all the data and provides near real-time visibility of it through dashboards. By applying deeper analytics, like ML/AI, connected machine data can be used to better understand the root cause of production micro-stoppages, improve throughput, and identify trends that lead to sub-optimal manufacturing.

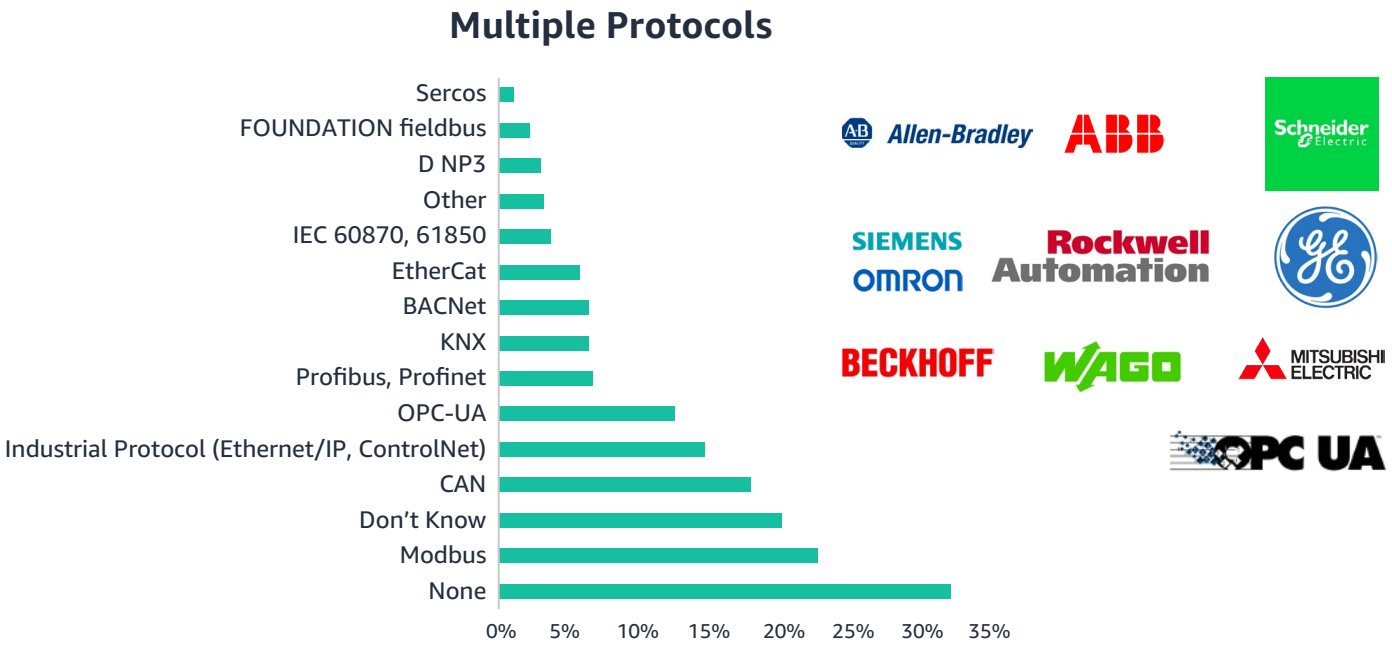
Industry 4.0 heralds new opportunities for transformation by empowering manufacturers to use centrally managed, readily consumable IoT data to solve business problems.

Overcome the challenges of disparate IoT

If you're like most manufacturers today, you run a hodgepodge of IoT devices and protocols across your factories and fleets. Individually, they capture important metrics, but there's no easy way to bring all the data together for real-time, big-picture insights. Certifying edge hardware takes a tremendous amount of work—ensuring device connectivity, integrating operational technology (OT) with IT, and scaling the solution across plants.

Rather than investing in one-off builds that bring your data together, you need a scalable, repeatable solution you can implement quickly. The AWS IoT Industrial Machine Connectivity (IMC) kit makes it easy to collect, organize, and extract value from industrial data. The kit provides a quick start approach to automatic deployment using pre-configured tools.

https://www.mckinsey.com/business-functions/operations/our-insights/manufacturing-analytics-unleashes-productivity-and-profitability



Unlock IoT data with the AWS IMC kit

The AWS IoT Industrial Machine Connectivity (IMC) kit equips AWS Professional Services (ProServe) and qualified SI or GSI partners with the resources and support they need to combine IoT data from your environment into a dashboard in under four weeks. Components in the IMC kit work with any device and any protocol, allowing you to use the assets you already have. As part of the engagement, partners guide you through the dashboard to spot a trouble area and resolve the issue with insights from the data.

Improve productivity without compromising quality by using a dashboard to see where you can make adjustments

[1]Michael Schallehn, Christopher Schorling, Peter Bowen and Oliver Straehle, "Beyond Proofs of Concept: Scaling the Industrial IoT." Bain and Company, 30 Jan. 2019. https://www.bain.com/insights/beyond-proofs-of-concept-scaling-the-industrial-iot/

Extract more value through customized extensions

After completing the IMC kit installation at a single location, you can continue to work with your partner to build out scalable IoT solutions that will trigger your Industry 4.0 transformation. Examples of possible projects include:

- Implementing the kit in all your locations and creating a company-wide dashboard
- Applying data analytics to specific business problems and optimizing for desired outcomes
- Writing customized AI to automatically identify and address issues using IoT data

Talk to your partner about business problems or opportunities.

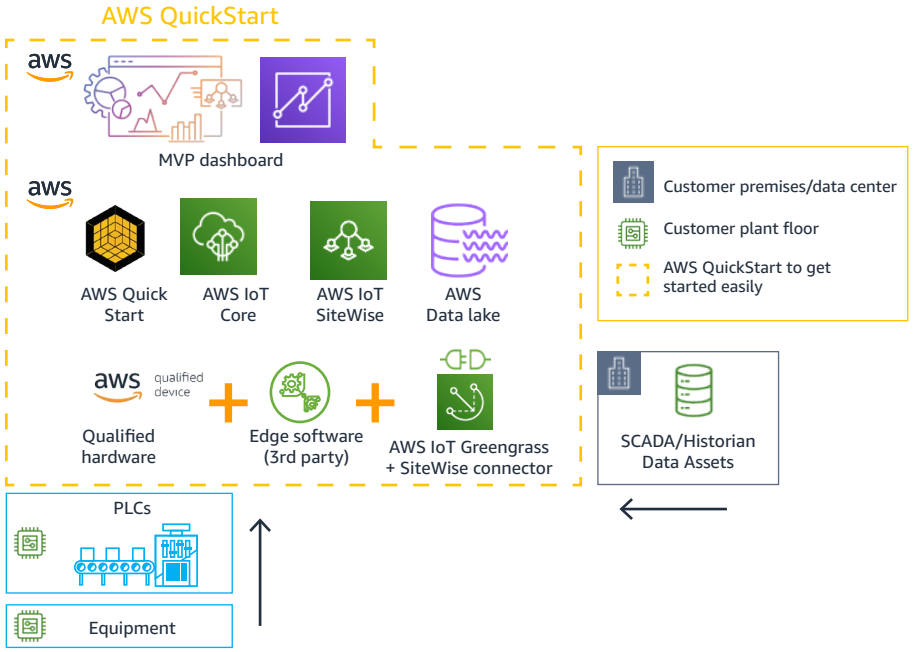
Connect to the power of AWS using proven components

The AWS IMC kit was designed to offer a repeatable way to connect, collect, and organize IoT data. The IMC kit includes technical and business assessments to pinpoint the correct workstreams, qualified hardware and software components that integrate with AWS IoT services, and professional deployment expertise by AWS ProServe and GSI or SI partners.

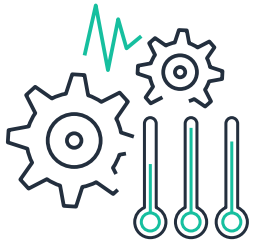
The IMC kit components integrate with AWS IoT Greengrass, AWS IoT SiteWise, or AWS Snowball and AWS Snowball Edge, enabling you to bring the power and innovation of AWS to your toughest business challenges.

AWS makes it easy to get started from where you are today:

1. Collect data with AWS IoT Greengrass and AWS IoT Core using MQTT connectors from your legacy SCADA systems and historians
2. Move entire asset frameworks to AWS IoT SiteWise with asset metadata transfer automation software and scripts
3. Convert data from proprietary industry protocols to OPC-UA/MQTT to connect with the cloud using industrial protocol conversion software



Anything is possible with the AWS Connected Factory solution



Predictive maintenance – stamping line

Conditional monitoring helps you predict premature failures of assets weeks ahead of breakage and reduce downtime. By measuring voltage, current, tool vibration, motor performance, and friction/heat of the tooling joints and comparing real-time values with the normal operating range, you can monitor the health of the assets.

Predictive quality management and OEE – welding

A closed feedback loop allows you to continuously learn ways to improve your overall system and drive output. Monitor and measure overall equipment effectiveness or OEE to improve operations and reduce waste. Detect patterns that cause weld defects by checking process variable measurements (such as voltage, current, end effector tool vibration, weld tip lifecycle, splatter pattern, tool material, welding wire material, weld speed, and images of the weld) against good/bad quality welds.

Energy/water usage optimization – facilities management and sustainability

Performance modeling helps you optimize how you run your existing facilities and machinery to save energy and money. Log and monitor all your process variables in near real-time and use machine learning algorithms to identify areas that yield the greatest improvement. Variables may include: discharge pressure, discharge temperatures, production variables, quality variables, moisture content, ambient conditions, suction pressure, slide valve positions, VSD speeds, or supply and return temperatures.

Find an approved IoT partner

AWS validates hardware by AWS Partners for FreeRTOS, AWS IoT Greengrass, AWS IoT Core, and Amazon Kinesis Video Streams as part of the AWS Device Qualification Program (DQP). Today, over a dozen Deployment partners have already achieved this distinction. Discover the latest solutions and hardware in the IoT Solutions Repository and the Partner Device Catalog.

AWS Partners for AWS Connected Factory solution

Partner solutions

Deployment partners

Edge applications

Qualified hardware

View your plant data faster

AWS offers two options for deploying the IMC kit—via an AWS Partner or ProServe. Choose the method that is right for you and get started today.

Configure a production-ready solution and improve operations in under 12 weeks

For a fixed price, AWS ProServe will deploy a production ready end-to-end solution at a pilot site with a fixed menu of features that allows you to:

1. Integrate data from equipment on a single production line to visualize real-time operational metrics on cloud dashboards
2. Create a rapid deployment template that will automate the deployment of the single-line solution to similar lines across plants, divisions and geographies globally
3. Demonstrate business outcomes against pre-agreed key performance indicators (KPIs) at the end of the pilot

Build a business case for Industry 4.0 and run a Proof of Value in less than 4 weeks

Over a 4-week period, an AWS Partner will help you build a business case for your Industry 4.0 initiative. The Proof of Value is designed to enable customers to get data from their assets into the AWS Cloud in a simple, structured process so they can rapidly realize the business value that is derived from that data. Customers can convert existing asset hierarchy definitions (i.e. factory, lines, machines, tags, etc.) defined in partner edge applications like Inductive Automation's Ignition Server or PTC's KEPServerEX to the equivalent asset hierarchy within AWS IoT SiteWise. With asset hierarchies defined within AWS IoT SiteWise, customer data can be ingested continuously into the AWS Cloud and all the pertinent metadata is readily accessible for applications to help customers uncover business value, such as developing more efficient maintenance schedules from asset condition monitoring dashboards.