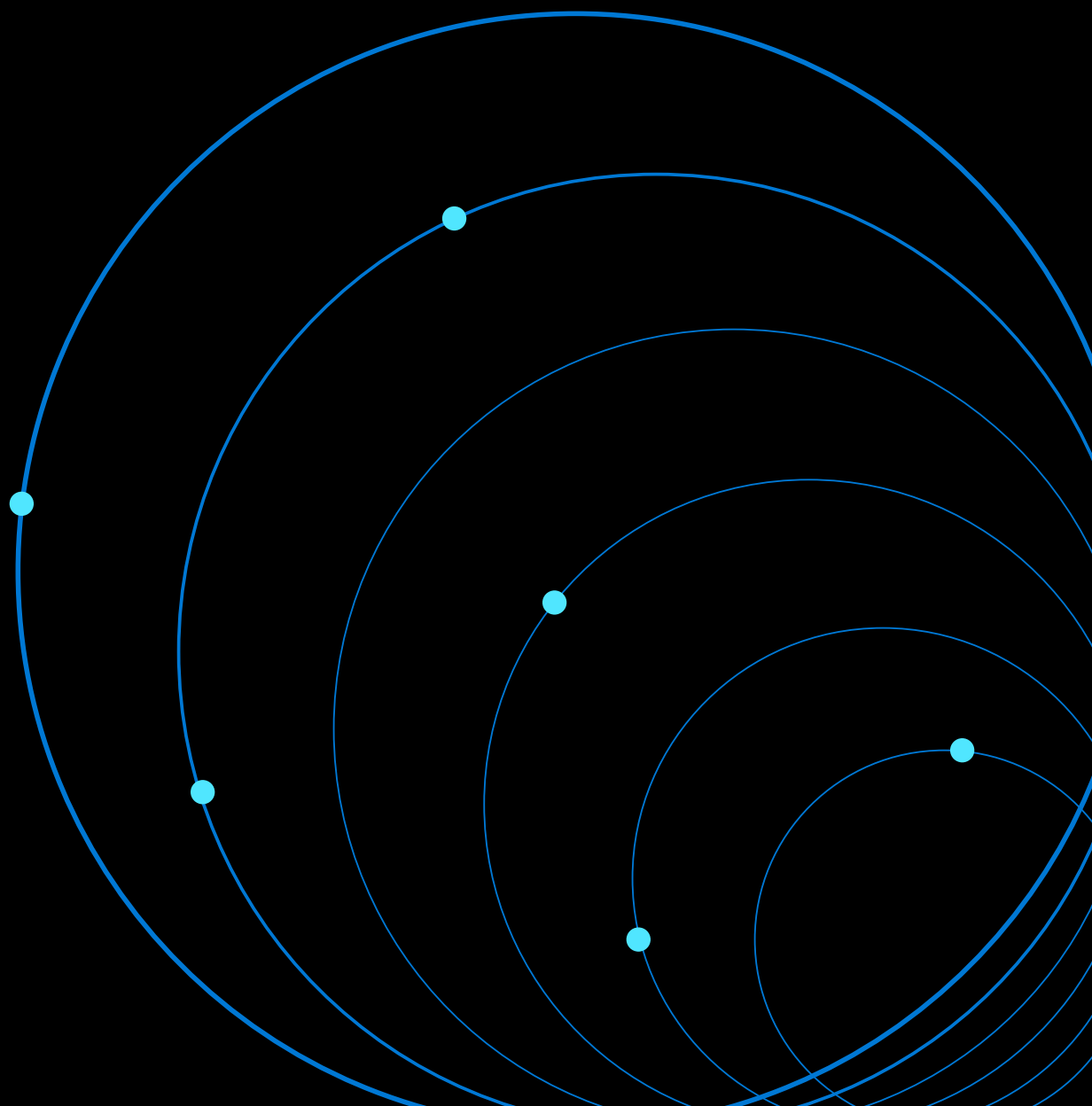
E-book series

Microsoft Azure

IoT in the real world

Stories from manufacturing



Contents

From a manufacturing company to a data company

With 120,000 employees in more than 150 countries and $30+ billion in annual global sales, Johnson Controls has been a top manufacturer of building technologies and solutions for more than 100 years. See how they are using IoT to usher in the next era of data-driven success for their customers.

Watch now ›

Johnson Controls

> Ultimately, it is about working from the customer's requirements back, and identifying what kind of problems we need to solve, and what's going to be the most optimal way of solving those problems.

Vineet Sinha,
GM Enterprise Management and Smart Connected Equipment, Johnson Controls

Three best practices from Johnson Controls

01

Data-driven—Embrace being not only a manufacturing company but also a data-driven, service-driven company. Quell any anxiety around the change by teaching and learning together with your customers.

02

Solutions mindset—Work from your customer requirements back. Identify problems first, hypothesize process solutions, and then see how IoT can be used to get the results.

03

Security—Build further cybersecurity capabilities into your IoT solutions as needed, and consider additional cybersecurity processes to ensure data and privacy is protected.

Top energy leader plans for scaled impact of IoT

Schneider Electric employs approximately 144,000 people and has a rich history as a global leader in energy management and automation. See how they choose and implement IoT projects, planning for scalability from the start.

Watch now >

Schneider Electric

The first thing you have to do is to find the correct machine to test your solution. So it has to be a really important machine, maybe with a lot of problems or when the impact will be really huge.

Mathieu Pompeo,
Smart Factory Project Leader,
Schneider Electric

Three best practices from Schneider Electric

01

Scalability—By creating an architecture that can scale IoT through your ecosystem from the beginning, replicating success across different manufacturing steps will be much easier.

02

Test wisely—Find the correct machine to test your solution, one that has the potential to show high impact so that you have a strong proof of concept for IoT from which to build support around expansion.

03

Workforce engagement—Identify skills and staff needed for your project, and involve those people up front. Train operations staff as needed before implementation so they can use the information your devices capture.

Successful snack manufacturer prepares for global growth

One of the largest family-owned snack food companies in Australia, Majans employs 120 people in its Queensland plant. See how the company is improving efficiency and modernizing operations a step at a time.

Watch now >

We didn't see IoT as a cost, we saw it as an investment, and we saw it as a cost-avoidance program. The whole business was committed to putting the money in now, so that we can save money in our day-to-day operations.

Andrew McManus,
Manufacturing Manager,
Majans

Three best practices from Majans

01

Financial impact—Position IoT as a way to save money in day-to-day operations to get stakeholders on board, which will increase support and make roll-out easier.

02

Start small—Plan for scale-ready IoT infrastructure by identifying one simple factory line and one or two things you want to measure to contain the complexity of coordinating different technologies, machines, and systems. Then scale up and roll out across other processes.

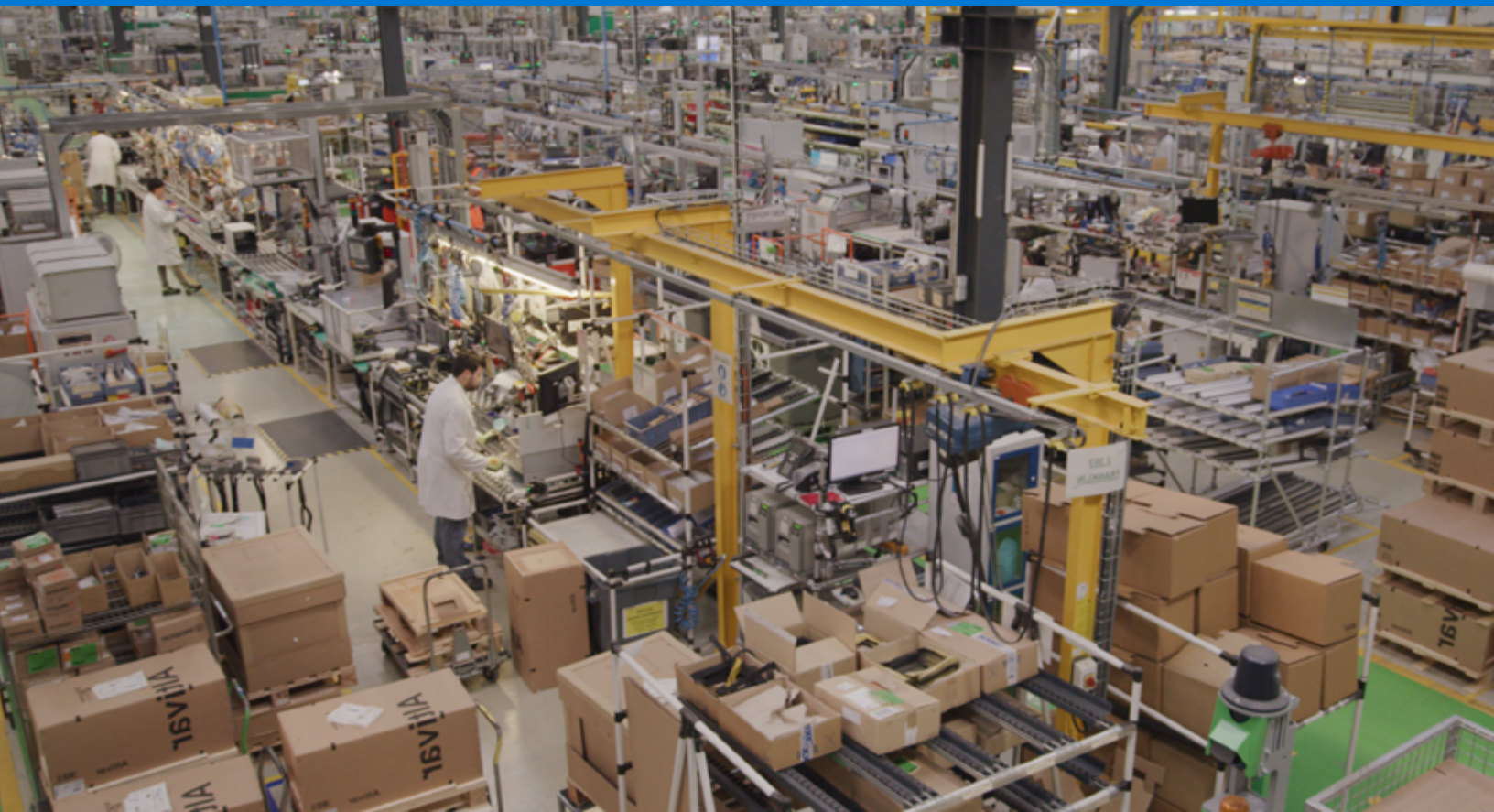
03

Interoperability—Manage challenges around multiple platforms and technologies by leveraging/choosing your suppliers and partners carefully.

Introduction

The last time you were at a trade show or conference, did you hear about your competitor and how they are using IoT? The Internet of Things (IoT) is more than the latest buzzword in technology. It's a real game-changer that can create business value from previously hidden data, especially for manufacturers.

Don't let concerns about cost, complexity, or security hold you back. All are manageable, and you don't want to fall behind just because you're unsure where to begin with Industry 4.0.



Learn from leading companies

"Isn't IoT expensive?"

It's a huge disruptor to our industry to be able to connect more directly with our end-user customers, to be able to track our devices, to be able to track how the devices and the gear are performing, but then also to derive new business models, new value streams that help our customers do more with what they have.

Michael MacKenzie,
Vice President of EcoStruxure Technology Platforms,
Schneider Electric

It can be, but it doesn't have to be. The real trick is understanding what the true and complete cost will be and what ROI you can expaect. The place to start is with your challenges. What are you trying to solve? Then you can look at the costs associated with that issue now, the IoT investment required, and the expected savings for comparison.

The good news is, you don't have to figure it all out yourself. A trusted partner can help you look realistically at the process and offer multiple options depending on your needs and budget—everything from simple device sensors connected to your existing brownfield facilities, to a fully managed solution priced per device—so you know exactly what it's going to cost now, and over time.

"We don't know where to begin."

The advice I would give any organization is first and foremost, understand the problem. Fall in love with the problem, not the solution. And once you understand the problem, then look to partner with somebody who can bring future-rich solutions such as Microsoft, who I feel is very strong in its marketplace at the moment.

Shane O'Neill,
Enterprise Infrastructure Architect and IoT Lead,
Rolls Royce

Many manufacturers, especially small and medium-sized ones, see IoT and its many moving parts as overwhelming. It can be difficult to know where to begin, what should be in scope, whether new technology is required, and what the impact on your business will be. Starting small is a great strategy. You can scale over time, making additional investments where they make the most sense for your business. Once the initial deployment is running smoothly, you can scale out.

"What about security?"

From a security standpoint, assets in the manufacturing environment have to be managed. Obviously, you can't break production, but you have to maintain some kind of security in that environment.

Doug Weber,
Business Manager, Analytics & Collaboration,
Rockwell Automation

Without proper planning and oversight, IoT has the potential to expose or introduce vulnerabilities in areas like device control and data privacy, so your security should be top-of-mind. But it shouldn't stop you from taking advantage of IoT to improve your business. It does mean you should choose your technology partners carefully. Microsoft builds security into every level of our products and services. Azure IoT is built for peace of mind with an end-to-end approach that maintains control and trust for data, devices, and applications.

IoT growth: by the numbers

IoT is growing in organizations of all sizes, and you don't have to be a large enterprise to see the benefits.

$267 billion

Predicted spend on IoT by manufacturers by 2020[1]

+ $100 million

Average increase in operating income among the most digitally transformed enterprises[2]

25.1 billion

Gartner predicts 25.1 billion installed IoT units by the end of 2021[3]

What is IoT?

The Internet of Things is just that. Your things—machines, trucks, products, any kind of device or durable good—are outfitted with data collection sensors and transmission capability. All your things are connected through the Internet, so your business systems can receive and analyze that data for insights. Then you can act on the data, by discrete decisions, or in an automated way that's triggered by a specific set of conditions.

How IoT benefits your business

Now that you can harness the equipment you already have and use it to gather data that reveals new insights, how can you make that benefit your business?

These eight IoT scenarios are providing businesses with real value:

Remote monitoring

Capture data from devices and monitor performance to improve business systems.

Predictive maintenance

Analyze performance and condition of equipment and machinery, apply advanced analytics to make predictions of when maintenance is required.

Connected supply chain

Gain real time insight to drive greater efficiencies, ensure higher quality and minimize loss across the entire supply chain.

Facilities management

Manage your spaces, buildings, factories and fields to reduce waste, optimize efficiency and enhance productivity.

Operational excellence

Blend all operational data, analyze it in real-time and over time with a historian and optimize your processes.

Connected products

Shift from selling products to selling outcomes to improve customer engagement, service quality and transform your business.

Overall equipment efficiency

Maximize the performance of your machinery, processes and production lines by ensuring optimal operations relative to designed capacity.

Precision farming

monitor, manage and optimize the use of land, water, and other resources by collecting data that enriches decision-making and leads to yield maximization.

Consider this scenario in manufacturing. Every time some part of the line breaks, it not only costs money to fix, but you also miss out on the profit not being generated while it's down. And every time some substandard raw material, part, or manufacturing error makes its way through, there's a lot of waste and expense associated with the issue. What if you knew when a break was likely to happen before it does? Or you could detect quality issues before the end of the line? What if you could detect issues for customers using your products, making service an integral part of your brand? You can, with IoT.

Plan for success

Once you've decided that you need the business value that only IoT can provide, it's time to start planning. According to 2018 research conducted by Keystone about implementing IoT, the biggest consideration is internal change management. Successful adoption of IoT relies on both top-down and bottom-up commitment to the initiative, as well as cross-functional collaboration. Internal change management is often the most difficult area for companies. They may face resistance to change from both leadership and employees, or find it difficult to facilitate collaboration across functions.

Getting leadership buy-in

Gaining top-down support can be challenging if the project is viewed as "just another IT initiative." And getting buy-in from senior leaders within your organization is crucial for a number of reasons, such as:

- Garnering necessary funding
- Aligning around corporate-wide metrics
- Demonstrating that the company is "all in"
- Providing necessary personnel to support the initiative
- Enabling cross-functional teams

You're more likely to gain needed support by thinking from the leaders' point of view. Framing the project in terms of how it meets specific business needs is critical, and engaging in initial consultation with customers can also help gather evidence for the impact your initiative could have. Bringing in evidence of competitor activity can also highlight the urgency of competing effectively using IoT and show viability as evidenced by the competition.

Motivating employee adoption

Gaining bottom-up support can be challenging if employees perceive IoT as threatening their current jobs and familiar ways of working. But it is critical and can have a tremendously positive impact on culture, morale, and overall business performance by:

- Ensuring the organization has the appropriate expertise to support an IoT initiative
- Identifying priority training requirements
- Creating implementation plans that maximize internal adoption
- Aligning your organization to a common set of goals and metrics
- Clearly communicating how Industry 4.0 will support the workforce and evolve the organization

Help employees feel like they have a voice in the change by communicating transparently and frequently, demonstrating how IoT will help achieve company goals, and clearly defining any necessary shifts in culture. Training existing employees is also key to gaining their support. Identify those with the right traits such as data curiosity and technology interests, and provide education in the form of e-learning modules, IoT videos, in-person training sessions, expert instruction, or online classes. Some new talent will almost certainly be required as well, often in the areas of engineering, data analytics, and IoT leadership. Involving HR early is important on both fronts.

Creating a cross-functional team

Siloed organizational structures often don't align well with digital transformation requirements. IoT initiatives generally span many divisions of an enterprise, requiring cross-team alignment and collaboration. Forming a deliberate cross-functional team is vital to success. Three options emerged in Keystone's research for structuring such a team:

- Stand-alone business unit with P&L responsibility for smart, connected products
- Cross-business-unit steering committee of thought leaders across various business units
- Center of excellence, a separate cost center that other business units can tap for support

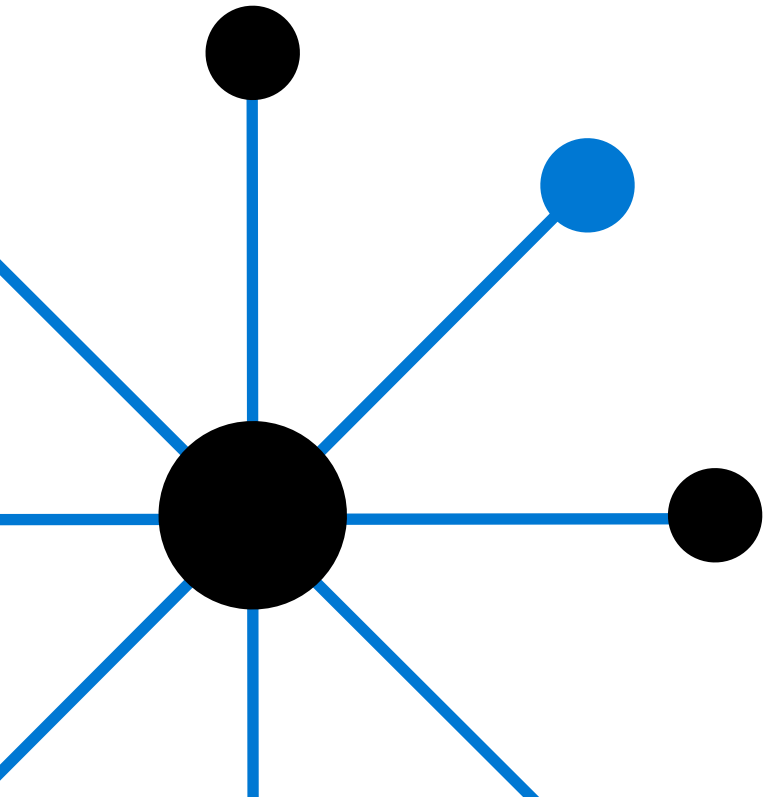
Without alignment, disparate teams often engage in uncoordinated efforts leading to poor or inconsistent implementation. Breaking down silos by creating a cross-functional team provides the cross-disciplinary input needed to define a successful path and ensures access to insights and necessary data that cut across existing departments.

Committing to data

To succeed with IoT, a company needs a data-driven culture that makes data collection, data access, data privacy, and data security core aspects of how employees think about the information being captured by devices and sensors. This need for data, and collaboration around data, cuts across teams, functions, and lines of business. Data is the lifeblood of IoT, but the full value of data can only be realized when all business units are on board. Data value grows exponentially when business units coordinate and share.

To that end, it is critical to have a plan for data from the beginning and make interoperability – including centralization of information (in a single data lake), consistent interfaces between applications, standardized integration opportunities, and open standards – part of the selection criteria for IoT platforms.

In addition, data analytics must become a priority if it isn't already. This requires data literacy from stakeholders who may not have previously seen metrics and analytics as major requirements of their roles. Manufacturers will want to optimize the use of existing capabilities across the organization and also identify skills gaps in newly crucial areas—including not only IoT and data sciences, but also architecture, artificial intelligence, and machine learning.



Get started with Microsoft

Through Azure IoT, Microsoft offers a full range of secured solutions for IoT scenarios in manufacturing. And we know how important it is to meet you where you are, start small, scale on success, and offer options for whatever degree of automation or control makes sense for your business.

You want to choose the right partner to help guide you. And we've been empowering manufacturers from the front office to the factory floor for decades. With the largest partner ecosystem in the world and a proven track record of success in IoT, Microsoft is ready to help—now and in the future.

- **Who can I talk to about IoT?**
- **What can I share with my technical team?**
- **Who can help me set up my IoT solution?**

[1] https://www.businessinsider.com/internet-of-things-in-manufacturing-2016-10

[2] Keystonwe Strategy interviews October 2015 - March 2016; Incremental operating income of $100M is based on median company revenue of $3.4B

[3] Gartner Getting Started: How to Strategize, Prepare, Plan and Manage Enterprise IoT Projects, Emil Berthelsen, Peter Havart-Simkin, 12 April 2018