



Creating the Internet of Your Things

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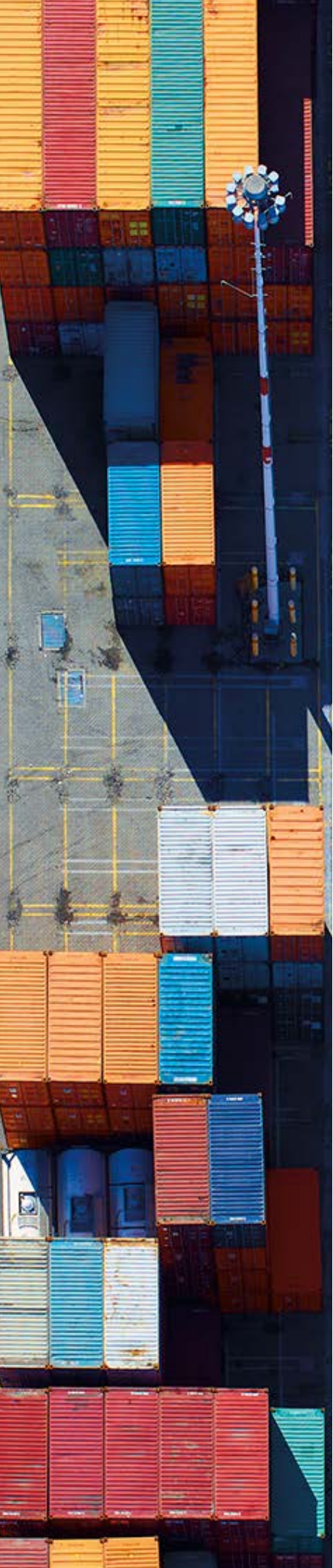
Executive Summary

Where is your business going? How are you going to make it thrive? How will you make the most of what you have, and incorporate today's and tomorrow's technology breakthroughs to ensure your business is set up for the long term? How are you going to help your employees become more efficient? How are you going to reduce costs yet improve customer service? The answers to these questions—and many more—likely already exist in your business with the data and systems you have today. You may need ideas, inspiration, and technology partners to help you stop running your business and start making it thrive.

Microsoft recognizes that buzz about new technology can be exciting but also challenging to assess from a business perspective. The Internet of Things, also known as IoT, is one such trend. The Internet of Things provides vast opportunities, but it can also pose a challenge to enterprises.

The Internet of Things has kept plenty of technology journalists busy during the past year, but few have answered the most important questions of how to make it relevant to your business today. Instead, it often seems overwhelming, complicated, and expensive.

It's no wonder many companies are uncertain about implementing an IoT strategy. In this paper, we explain how to look beyond the hype and start on a path that will unlock the potential of the Internet of Your Things. Real, transformative results in your organization await, and it's easier than you think.



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Understanding the Internet of Things

The term “Internet of Things” isn’t new. Almost 20 years ago, MIT professors described a world where “things” (devices or sensors) are connected and able to share data. Data coming from these devices and sensors provide business insights that were previously out of reach. The invaluable insights enabled by harnessing and analyzing the data from these connected devices are what the Internet of Things is all about.

Today the Internet of Things is at an inflection point. Although technology experts for decades have anticipated a world of billions of smart, connected devices, multiple factors have converged recently to accelerate adoption of IoT scenarios in businesses like yours. Consider the following:

- **Hardware costs are falling.** The costs of Internet of Things components such as microchips, GPS sensors, and accelerometers have fallen as volumes have increased. And it is not simply a cost reduction—tiny microchips are now capable of running more advanced software than ever.
- **More machines are talking to each other.** Machine-to-machine (M2M) solutions are going mainstream. Vodafone forecasts that 50 percent of companies will have adopted M2M communications technologies by 2020.¹
- **Software is more advanced than ever.** Today’s rich, dynamic business software is putting high-level data analysis capabilities into the hands of companies around the globe.
- **Connectivity is proliferating.** Previously, IoT solutions were limited to wired or wireless local area network connections as mobile operators priced M2M connections out of range. No longer. Fuelled by the additional capacity that advanced cellular networks provide, mobile operators are embracing the Internet of Things.
- **Cloud solutions offer lower costs, scale, and flexibility.** With the growth of services like Microsoft Azure, cloud storage and processing power is becoming more affordable and available, expanding the capability to analyze large amounts of data. Internet of Things scenarios that incorporate cloud-based storage, analysis, and other tools provide the added benefit of scalability and flexibility that businesses need when starting or expanding an IoT solution.
- **Potential economic benefits are enormous.** The Internet of Things has the potential to create economic impact of \$2.7 trillion to \$6.2 trillion annually by 2025, according to McKinsey Global Institute.²



With such huge potential, the marketing hype around the Internet of Things is creating a stream of noise. It seems like every technology company has an Internet of Things angle and their own set of buzzwords. And these buzzwords create confusion and inertia too often.

The Microsoft point of view on the Internet of Things

The Internet of Things does not need to be complicated. It doesn't have to be about billions or trillions of devices. The Internet of Things is here today, and it's a practical and applicable technology trend that can generate return on investment (ROI) and drive efficiencies and insights for organizations that know how to leverage it.

Across the globe every day, businesses are connecting their things and harnessing their data to create powerful new business value. Connecting devices to IT systems is only the first step. The real value lies in the data that is transmitted from those devices, and the compelling business insights this data can enable.

These connected "things" are producing large amounts of information. By tapping into those data streams and connecting them to the cloud and back-end systems, organizations can optimize business processes, make more informed decisions, identify new revenue opportunities, and understand and predict customer and partner behaviors in ways they couldn't imagine before.

At Microsoft, we believe the Internet of Things can make a difference to your business right now—beginning with the things in your business that matter the most. It's really the **Internet of Your Things**, and it starts by building on the infrastructure you already have in place, using familiar devices and services in new ways, and incorporating the right technology to ultimately help you use data to create insights and make more informed business decisions.

Rather than thinking about the **Internet of Things** as trillions of abstract devices and sensors, think about your things—your devices, sensors, IT infrastructure, cloud services, and software.

Instead of thinking about the massive amount of data being produced by billions of devices, think about how one piece of data about your customers, your processes, sales or inventory could provide value to your organization.

These are your things; they're critical to you and help you power your business.

The impact of data and the cloud

The advancements in connectivity, processing power, form factors, operating systems, and applications, among other technology breakthroughs, are key elements to unlocking value from the Internet of Things. And with these advancements, the impact of data and the cloud is paramount to using the power and potential of the Internet of Things.

Data is mission-critical to your business. Data can have different formats, values, retention requirements, and traffic patterns. It comes from different sources (intelligent industry devices, services, and more) and across different protocols.

This data may arrive at your doorstep predictably and structured, but it may also knock on the door in the middle of the night unexpectedly. By providing a framework for the data to ingress and be processed, Microsoft can automate through filters, rules, triggers, or other means—the reception of that data. Most important, data in the typical Internet of Things conversation is large—too large for a traditional organization's compute models to cost-effectively consume and manage.

Big data is the term for a collection of data sets so large and complex that they become difficult to process using typical on-premises database management and processing applications. Big data needs to be processed by a flexible, scalable compute model that evolves as your business evolves. Big data needs to be contextual and, through its very nature, combined with many other assets, sources, and datasets. By possessing data with a set of tools, engines, and scalable architecture, Microsoft is uniquely positioned in the industry to help you take advantage of your data, and then process and apply optimization to your assets. This can be done both on the operational side and when driving new and richer business insight strategy. Above all else, the power of the cloud to harness, store, and draw insights from your data is a game changer.

Cloud computing offers scalable data collection, processing, and analysis capabilities that are flexible to the needs of your business. Cloud solutions give businesses the ability to store and process significant amounts of data, whether it's latent or in real time; store that data; and apply rules and structure to it for consumption. Cloud computing technology and a flexible consumption-based price structure associated with off-premises hybrid, private, or public cloud compute models have created the ability to deliver new offerings to market, which were simply not achievable in the past.

The cloud also enables more data to be unlocked by enabling you to pull data in from different sources and across different line-of-business assets and devices. This data may arrive structured, unstructured or somewhere in between.

It may arrive regularly or intermittently. Despite this variability, by providing a framework for the data, Microsoft can automate—through filters, rules, triggers or other means—the intelligent processing of that data.

Internet of Things scenarios are even more valuable when you combine data from line-of-business assets and devices with data from other systems in your business. When you use cloud-based solutions for storage and analysis, you can combine data from multiple sources without worrying about capacity constraints or the significant costs that might result from building out your on-premises infrastructure. With a variety of cloud services to enable IoT scenarios, Microsoft is uniquely positioned to help you take advantage of your data.

Microsoft Azure Internet of Things services

As you might expect from a proven leader in the enterprise space, Microsoft has the mobile and cloud technology you need to make your Internet of Things plans come to fruition.

With **Microsoft Azure Internet of Things (IoT) services**, you can monitor assets to improve efficiencies, drive operational performance to enable innovation, and use advance data analytics to transform your business with new business models and revenue streams. Small changes can have a big impact to your bottom line. When you take advantage of the Microsoft cloud platform, you can use Azure services to help you move faster, do more, save money, and capture the benefits of the Internet of Things for your business.

Most important, you don't have to be at a particular juncture in adopting IoT scenarios in your business to benefit. You might be just starting to look at how you might improve a particular business process or you might already have years invested in creating an IoT solution.

Whatever the case may be, Azure IoT services meet your business where you are today—whether you're focused on where to start or ready to scale your IoT scenarios.



Here are some of the ways **Microsoft Azure IoT services** can help your business:

Improve Efficiency

Understanding the health of diverse line-of-business assets and devices can be a challenge. When you can easily connect and monitor these assets and devices, you can track their condition and performance over time. Rules and alerts notify the right team or department in your business when action is needed, so you can improve business processes and efficiencies.

Enable Innovation

Businesses that learn and adapt will continue to thrive. When you can see trends as they emerge, your business will be better able to respond to opportunities and threats. By monitoring and analyzing data from multiple sources in real time, you can enable your business to innovate and make the most out of the situation.

Transform your business

Data is only ones and zeros until you turn it into insights and business impact. When you leverage the data from your asset monitoring and use advanced data analytics to enhance decision-making and innovation, you can see the potential to transform your business by creating new business models and revenue streams through data insights.

Using the Microsoft Azure IoT services opens up a variety of new business possibilities. For example, Microsoft is working with telent and CGI to help **London Underground** modernize the systems that securely monitor, manage, and automate its things—everything from escalators, lifts, and HVAC controls to closed-circuit video and communication systems. Data from sensors and intelligent edge devices, such as temperature, vibration, humidity, fault warnings, and system alerts, are all available in one central location to provide access to needed information via mobile apps, a web browser, or text alerts.

Microsoft and its partners have also been working with **Royal Caribbean International**, which wanted to gain better insight into customer behavior and enhance workflow on its innovative new cruise ships. It deployed a solution that connected over 500 point-of-sales terminals, digital signs, and tablets.

This IoT solution improved the guest experience by providing ready access to photos for guests, improved the effectiveness of upsell interactions, and improved workflow (for example, reducing food inspection time from five hours to two hours).

Why Microsoft is best positioned to help you build the Internet of Your Things

Microsoft is likely already a strategic partner for your business with the platforms, infrastructure, and productivity tools you use today. Through its comprehensive technology offerings, such as Azure IoT services, Microsoft can help your business build on your existing technology and help unlock the potential of the Internet of Your Things—today.

Proven Microsoft experience and leadership can help you generate better, faster results, with less risk.

Microsoft delivers a comprehensive portfolio of traditional and cloud-based technologies, devices, and services to accelerate how you can create and use the Internet of Your Things.

With Microsoft, you can do the following:

- **Build on what already works.** Microsoft is a proven leader in the enterprise space, and has a longstanding commitment to help companies build on their existing technology assets, devices, and data to derive business value from the Internet of Things. So, choosing Azure IoT services enables you to take advantage of your existing infrastructure and technology investments.
- **Lean on trusted support and expertise.** Microsoft delivers technologies to enable your IoT solutions—cloud, networks and gateways, heterogeneous device support, systems capabilities, and data analytics. Microsoft has the right devices, the right tools, the right solutions and the right partners to take your business to the next level with the Internet of Your Things.
- **Have a trusted vendor to meet your business where you are today.** Most important, you don't have to be at a particular juncture in adopting Internet of Things scenarios in your business to get benefit. You might be just starting to look at how you might improve a particular business process or you might already have years invested in creating an IoT solution. Whatever the case may be, Azure IoT services meet your business where you are today—whether you're focused on where to start or ready to scale your IoT scenarios.
- **Unlock innovation with a cohesive ecosystem of partners and solutions.** Microsoft has a global partner ecosystem that is expert in putting technology to work on your company's challenges. Together with our partners, we have the technology and the experience to transform your business, right now. These partners know that Microsoft plays well with others, supporting your existing technology investments—even if they aren't Microsoft investments. With Microsoft and our ecosystem of leading experts and visionaries in the IoT space, you will deliver ROI faster.

Conclusion: A game-changing opportunity

The Internet of Your Things represents an immense opportunity. Imagine the power of unlocking the insights and data in the following scenarios:

- Point-of-sale scanners on a retail floor are connected to warehouse systems and analytics software at headquarters, for industry-leading efficiency in inventory.
- Robots on a factory floor send production and maintenance information directly to those who need it, for unparalleled reliability and uptime.
- Diagnostic images from a CT-scan machine are shared in near real time with radiologists at another medical facility and the family doctor, for improved patient care.

Other industry leaders aren't waiting. Microsoft is delivering the mobile and cloud services for the Internet of Things today, helping customers drive operational efficiency, improve innovation and enable the creation of new business models. Working together, we can transform your business by starting from your existing assets and creating new insights.

Microsoft looks forward to seeing what we can help you create with the Internet of Your Things. The potential is as limitless as your imagination and as unique as your business.

¹ Vodafone, The M2M Adoption Barometer, June 2013.

² McKinsey Global Institute, [Disruptive technologies: Advances that will transform life, business, and the global economy](#), May 2013.

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Get started today

Learn how you can put the Internet of Things to work for your business today:

- Learn more about how to create the **Internet of Your Things** in your organization.
- Learn more about the **Microsoft Azure IoT** services.

