

Creating the Internet of Your Things

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Executive Summary

Where is your business going? How will you 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 that keep you up at night—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.

While technology trends and buzz can be exciting to read about, they can also be challenging to assess from a business perspective and challenging to drive business value from. 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, since it can seem overwhelming, complicated, and expensive.

At Microsoft, we know there are many conflicting messages in the marketplace about the massive scale and potential of the Internet of Things, so it's no wonder many companies are uncertain about implementing an IoT strategy. In this paper, Microsoft shows how to look beyond the hype and create a strategy that will unlock the potential of the Internet of Your Things to realize real, transformative results in your organization. It's easier than you think.

Contents

Understanding the Internet of Things 3

The Microsoft point of view on the Internet of Things..... 4

The impact of data and the cloud 4

Unleashing the Internet of Things with intelligent systems 5

Why bet on Microsoft to help you build the Internet of Your Things?..... 6

Conclusion: A game-changing opportunity 6

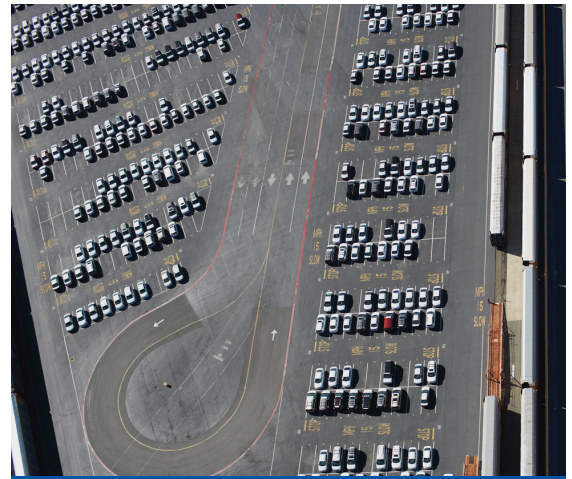
Getting started today..... 7

Understanding the Internet of Things

The term “the Internet of Things” isn’t new. It was actually coined nearly 20 years ago by professors at MIT to describe a world where “things,” which can be devices or sensors, are both smart and connected, with the ability to collect and share data. Data coming from those devices and/or sensors is endless, and when combined and analyzed with other types of data, it can uncover insights that were out of reach in the past. The relationships between all these things, and the invaluable data created by them, is what the Internet of Things is all about. Imagine if your business could understand and make use of the data collected by the things most important to your business and its processes, and if that understanding could help make your business thrive.

Although technology experts have anticipated the evolution of devices with embedded microchips, the proliferation of industry devices, and the rise of machine-to-machine communications scenarios for decades, today the Internet of Things is at an inflection point. Multiple factors are coming together to create the climate for major, worldwide adoption. Consider the following:

- **Costs are falling.** The costs of the Internet of Things components such as microchips, cloud services, GPS devices, accelerometers, connectivity, and other technologies have fallen and are now within reach for most organizations. In addition, processing power is becoming more affordable, and cloud computing services are increasingly available, vastly expanding the capability to crunch very large data sets.
- **Connected device demand is accelerating.** As more companies and consumers realize the value of connected things, the market is swelling into the billions and beyond.
- **Device options are expanding.** Everything from light bulbs and washing machines to point-of-sale terminals is becoming connected, and that connectivity is also greatly improved, whether it's wired, wireless, Wi-Fi, Bluetooth, cellular, or something else. And components are becoming more powerful—tiny microchips are now capable not only of connectivity but also of running much more advanced software than ever before.
- **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.
- **The 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 spiraling out of control and creating a steady stream of noise. It seems like every technology company has an Internet of Things pitch or angle, but in reality, most businesses are still touting the same set of products they've been selling.

The real differentiators will deliver innovation, end-to-end simplicity, and road maps that justify investments. A strategy for the Internet of Things needs to be simple to implement.

The results can't be outweighed by the effort and complexity. The data needs to be insightful, extensible, and connected to your business.

The Microsoft point of view on the Internet of Things

Despite persistent messages to the contrary, the Internet of Things does not need to be complicated. It's not about future predictions of billions or trillions of connected devices. The Internet of Things is here today, and it's a practical and applicable technology trend that is generating ROI and driving efficiencies and insights for organizations that know how to use 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 created by and transmitted from those devices as they interact with other devices and human beings, and the compelling business insights this data can enable.

Simply put, 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 devices and sensors connecting to systems and the cloud, think about your things—your devices, sensors, IT infrastructure, cloud services, and software.

Instead of trying to think about the massive amount of data being produced by billions of devices, think about how one piece of data—on your customers, your processes, sales, or inventory—can 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 are 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.

Cloud computing offers scalable data collection, processing, and analysis capabilities that change with the needs of your business and processes. Cloud solutions give enterprises the ability to consume 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.

Unleashing the Internet of Things with intelligent systems

Microsoft has the capabilities and experience to transform your business—right now—by building on your existing investments to easily create one truly flexible [intelligent system](#).



An intelligent system is transformative. 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 CAT-scan machine are shared instantly with radiologists at another medical facility and the family practitioner at the bedside, for state-of-the-art patient care. In each case, new insights are generated that drive the organization's objectives forward on many levels. Surprising new value is created from connecting assets that were already in place, and often by simply adding a few new devices that can tap into data in new ways.

Microsoft continues to invest in delivering the integrated platforms and services that help enterprises capitalize on the Internet of Things by gathering, storing, and processing data—this includes the [Microsoft Azure Intelligent Systems Service](#). Built on [Microsoft Azure](#), the Intelligent Systems Service makes it easier for enterprises to securely connect, manage, capture, and transform machine-generated data from line-of-business assets such as industry devices and sensors, regardless of their operating system.

When enterprises use Intelligent Systems Service to harness machine-generated data, they can drive improvements in operations and unlock new business opportunities by using Microsoft assets like [Power BI](#) for Office 365 and [HDInsight](#) for analytics to produce meaningful insights. Underlying all these capabilities is enterprise-grade security developed and supported by Microsoft.

Intelligent Systems Service provides agents and open-source agent software to support heterogeneous operating systems and protocols across these line-of-business assets. By supporting diverse environments, a barrier often associated with other customer solutions, enterprises can deploy and yield value from the Intelligent Systems Service at a faster rate. Also, having a unified approach to security distinguishes the solution with enterprise-grade security developed and supported by Microsoft. The Intelligent Systems Service is also distinguished as a horizontal solution applicable across industries, increasing the importance of partners in the sales cycle and often putting partners in the lead for solution implementation.

Using the Microsoft Azure Intelligent Systems Service 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 on mobile apps, a web browser, or through text alerts.

According to Steve Pears, managing director of rail for telent, telent is transforming its business with new services for London Underground not previously possible. Some transformations include automating manual processes, spotting equipment issues in real time before they cause service disruptions, and tracking equipment performance to support infrastructure planning.

Why bet on Microsoft 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, Microsoft has the analytics, business intelligence, and compute tools required to unlock the potential of the Internet of Things—today.

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

Businesses deploying customized intelligent systems with Microsoft can harness a trusted platform to gather data from the edge of the network, analyze it, and reap real business value. All the components are here today—the familiar Windows platform already powers everything from specialized industry devices to PCs, phones, and servers. The Microsoft Azure Intelligent Systems Service offers massive processing capabilities that can be tied into engaging analytics tools in Azure SQL Database, Power BI, and Office.

With Microsoft, you can do the following:

- **Build on what already works.** Microsoft can help you create an intelligent system to capture opportunities simply by building on your existing investments—and get you started today.
- **Lean on trusted support and expertise.** Microsoft is an industry leader with a clear vision for what the Internet of Things means to business. 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.
- **Unlock innovation with a cohesive platform and skilled partners.** Microsoft has a global ecosystem of partners who are experts in putting technology to work on your company's challenges—device manufacturers to build the next generation of devices and leading software vendors and systems integrators who can help you develop a compelling solution to make your vision a reality. Microsoft can connect you with all the pieces you need to create the Internet of Your Things. Together with our partners, we have the technology and the experience to transform your business, right now.

Conclusion:

A game-changing opportunity

Leveraging the Internet of Your Things with an intelligent system represents an immense opportunity for your business. For that reason, industry leaders aren't waiting.

Microsoft is delivering the technologies and services for the Internet of Things today, helping customers connect their things to reduce costs, drive operational efficiency, deliver better customer experiences, and more quickly respond to changing business conditions.

Working together, we can transform your business with better insight, enhanced customer service, improved processes, new business opportunities, and a real competitive edge.

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.

Get started today

Put the Internet of Your Things to work for you with four simple steps:

- Stay informed with the Internet of Your Things newsletter at www.InternetofYourThings.com.
- Learn about intelligent systems, the Microsoft solution for the Internet of Things, at www.microsoft.com/intelligentsystems.
- Request access to the Microsoft Azure Intelligent Systems Service limited public preview at www.microsoft.com/iss.
- Move your existing devices to a modern Windows platform by upgrading through volume licensing or buying new devices from our OEM partners at www.microsoft.com/windowseembedded/en-us/products-solutions-overview.aspx.

Why your business needs a strategy for the Internet of Things

- When you connect business systems and tap into new and existing data streams, you get real-time visibility into your processes, enabling you to make smarter decisions now—and better plans for the future.
- By putting the Internet of Your Things to work against the competition, you can gain an edge that allows you to become a leader in your industry. When you harness your data and connect your people and infrastructure, you can unlock new opportunities, increase efficiency, delight customers, and gain a real advantage over the competition.
- Open new business opportunities. By harnessing and analyzing data, your organization can more quickly spot trends, identify and prepare for new opportunities, open new revenue streams, predict customer and partner behavior, and innovate faster.
- Redefine customer service. When you build the Internet of Your Things, you gain greater insight into your customers, allowing you to provide what they want—sometimes before they even know they want it.

When you create truly personalized experiences that surpass your customers' needs, provide instant access to inventory information via connected devices, or offer speedy and streamlined service, you raise the bar on customer service—and that leads to loyal, repeat customers.

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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