



# The IoT-enabled enterprise

Reinventing industries on a global stage



## This isn't your father's business environment

The days of the 100-year-old company are over. Sure, some company names from the last century will still be recognizable. And values such as customer service, honesty, and integrity will never go out of style. But look closer at the most successful businesses in today's environment, and you will see organizations that are constantly finding ways to reinvent themselves. Redefining standard operating procedures and practices. Changing the ways they engage customers. Improving how they add value through the products and services they offer. Everything.

### Change is not surprising

Today's businesses operate in the sort of dynamic environment not seen since the first industrial revolution. In fact, in most expert opinions, the pace of change today far outweighs anything our ancestors experienced. However, in addition to the speed of change, organizations also face a number of other challenging market dynamics including:

**Hyper-informed (and sometimes misinformed) customers.** With so much publicly available information on the Internet, customers have access to an almost unlimited supply of facts and opinions about their purchase decisions. By the time they engage your sales force, many buyers already have a pretty good idea of what a "solution" looks like.

**Shrinking margins.** The Internet also gives these buyers access to far more options than ever before. For example, the buyer of a common household appliance such as a dishwasher can go to the local showroom, buy online from a manufacturer, buy from a wholesaler half a world away, or even buy from a public auction site like eBay. The sheer number of options has put sellers under incredible price pressures.

**Focus on experience.** Regardless of the industry, the number of options has also increased the attention on the buyer's experience. Don't like the ambiance of a certain store? There's an online retailer who can get it to you overnight. Is that supplier hard to work with and unreliable? There's a guy in Australia who can get the parts to you on time and for less. Tired of sitting for a half hour in your underwear, waiting for the doctor to finally show up? There's a boutique clinic down the street that respects your dignity and your busy schedule.

**Focus on outcomes.** The heart patient doesn't buy angioplasty; they buy a cleared artery. The homeowner doesn't buy a washing machine; they buy cleaned clothes. Gone are the days when buyers had to trust that products lived up to their promises. Now, with just a few clicks, they can access opinions from other buyers who have traveled the same road. Improved outcomes are becoming even more of a mandate in industries like healthcare due to rising costs and the demand for public funding.

## Knowledge really is power

As the old saying goes, knowledge is power. And in this day and age, it can seem like the buyer has every advantage. However, a new, innovative approach called the Internet of Things (IoT) is balancing the scales and helping sellers create a competitive advantage by providing today's hyper-informed buyers exactly what they are looking for.

In this white paper, we will accomplish three objectives. We'll start by clarifying what IoT really is. Then, we'll look at just some of the ways IoT is transforming three specific industries: healthcare, manufacturing, and retail. Lastly, we'll discuss how you can tap into the Internet of Your Things for a competitive advantage.

## What is IoT?

It should come as no surprise to anyone that more and more “things” are being equipped with intelligent sensors: household appliances, running shoes, manufacturing equipment, bracelets that monitor vital signs, practically everything in the modern automobile, and so much more. The kinds of things that can be (and are) embedded with intelligence are virtually endless. Just as the Internet vastly improved our ability to take advantage of computing power by increasing connectivity between our systems, IoT connects these myriad devices to the Internet, giving people the power to build better lives and allowing organizations to transform the way they do business.

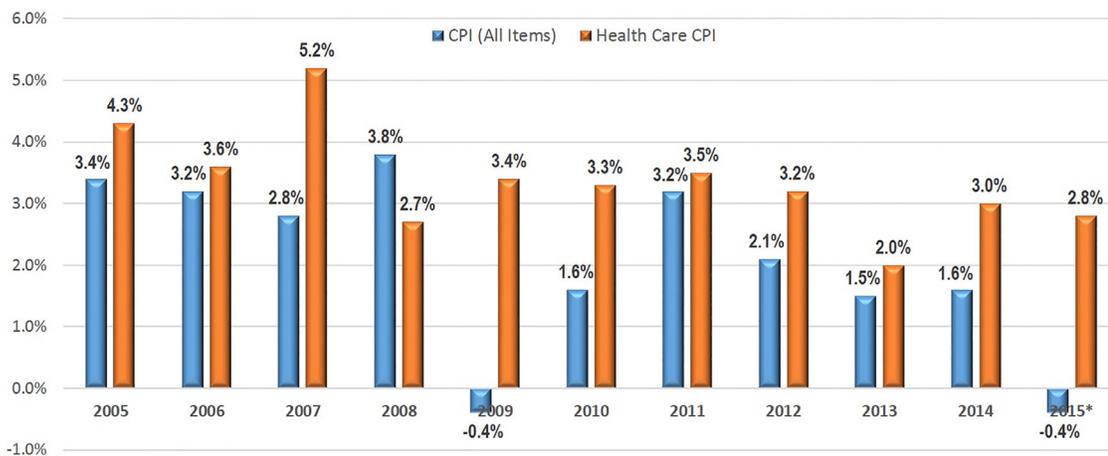
To help make sense of IoT, industry analysts often divide the discussion along two lines: consumer and industrial. Consumer IoT looks at consumer devices, such as household appliances, that can be connected to the Internet to help people live better. Industrial IoT focuses on how businesses can use intelligent devices and the data they collect to streamline and improve operations. In this paper, we will focus on industrial IoT, touching on consumer devices only when they are relevant to achieving business objectives.

## Healthcare: outcomes are essential

Perhaps no other industry has a greater incentive to do more with less. Despite the ACA's attempts to rein in costs, [the expense of healthcare services continues to outpace inflation](#).<sup>1</sup> With the public being asked to foot more of the bill, scrutiny of the efficacy of treatments and specific providers has increased.

CPI (All Items) & Health Care Inflation

*\*Through May 31, 2015*



## Putting the health back in healthcare

For years, visionaries have talked about ways we might reimagine healthcare to rein in costs and improve outcomes. One common suggestion has been to pay doctors, not for healing patients, but for keeping them healthy. That system may sound good, but it's easier proposed than implemented. However, IoT may be bringing us one giant step closer to making the dream a reality.

Wearable devices, from the low-cost fitness monitors you can buy at the gym to the more sophisticated devices, such as continuous glucose monitoring systems, are increasing the amount of information available to both individuals and healthcare providers. In turn, this information can help lower costs and improve outcomes in a number of ways:

**More focus on self-care.** Self-monitors, such as a wearable device that monitors something as simple as heart rate or level of movement throughout the day, can increase the average person's focus on their health. Instead of just thinking about their health occasionally, the device can let them know how they are doing as well as serve as “the rubber band around their finger” to remind them to take better care of their health.

**Limiting emergency room visits.** Patients with chronic diseases often make unnecessary trips to the emergency room because they can't tell the difference between feeling a little under the weather and a true emergency. A physician can access their vitals remotely and make an informed decision about when a visit is warranted or when the patient simply needs extra reassurance.

**Faster access to critical care.** Of course, when there is an emergency, every second counts. Monitoring vital signs can alert healthcare providers and patients to a problem such as an irregular heart rhythm even before the patient becomes aware of it, allowing for time to take action before the problem becomes life threatening or causes permanent damage.

**Fewer mistakes.** Sometimes symptoms come on suddenly, and then disappear just as suddenly. Home monitoring can provide the caregiver with a more complete picture and help avoid those tragic times when severely ill patients are sent home because they are temporarily asymptomatic.

**Improved collaboration between providers.** In addition to specializing, more and more doctors work as teams, providing a greater number of patients with access to quality care. Expanded access to data can improve collaboration between providers. In addition, when there is a record of case outcomes, general practitioners can have greater confidence when referring a patient to a specialist.

**More lifestyle-based remedies.** Medical procedures are costly. Prescriptions can have numerous side effects. Reputable physicians will almost always recommend lifestyle changes if they are indicated. Wearable devices can help physicians know how well these "prescriptions" are followed and better gauge their efficacy before resorting to more costly measures.

## Manufacturing: doing more with less

For manufacturers, IoT plays a dual role. To understand the power of IoT, it's helpful to look at the way data is used in a manufacturing environment.



**Monitor**—Workers can use smart devices to monitor the health of assets by collecting data from equipment and the shop floor.

**Control**—Smart devices also allow the user to control the equipment remotely, such as powering down the asset or adjusting settings.

**Automate**—Devices can also be used to start, stop, monitor, and change automated processes remotely, further eliminating the need for constant monitoring.

**Optimize**—Data sent to smart devices can also be used to manually or automatically optimize processes for improved performance or quality.

## Lean just got leaner

Here are three examples of how data monitoring alone can be used to improve operations:

**Predictive maintenance.** A piece of manufacturing equipment can cost millions of dollars. Sensors embedded into shop floor equipment can detect minute changes in performance or usage-level thresholds that indicate maintenance is required. This data can prolong the life of the manufacturer's equipment investment by focusing maintenance efforts where they are needed most.

**Avoid unplanned downtime.** Planned downtime is almost always shorter and far less disruptive than unplanned downtime. Using smart devices to continually monitor the status of equipment can eliminate many unpleasant surprises.

**Scrap reduction.** In many industries, quality is more than just job number one. For example, in foods and pharmaceuticals, tight calibration of equipment and formulas can mean the difference between a quality product and a scrapped production run. Real-time monitoring of equipment calibration or attributes of the product, such as sugar levels in a batch of ketchup, can improve overall product quality and reduce waste.

## Getting closer to the customer

Customer knowledge is key to building a competitive advantage, but manufacturers are often at least one step removed from those who use their products. IoT is changing that. By embedding smart devices into their products, manufacturers can collect data on how their products are being used, helping them increase customer engagement, provide better service, create new innovations, and offer new services to the marketplace.

One excellent example of this is the way HVAC manufacturers are building intelligence into their equipment, giving the home or business owner the power to control numerous factors such as temperature, humidity, and air recirculation from their mobile device. Future enhancements may also allow the owner to monitor attributes such as air quality, pollen count, CO<sub>2</sub>, or ozone levels. The son or daughter caring for an elderly parent with a chronic disease such as COPD can leave them at home with greater confidence, knowing that they can monitor air quality in their home with just a couple of clicks. At the same time, the HVAC manufacturer can collect data about how consumers use their products as well as increase service opportunities by alerting owners to potential problems.

## Retail: buyer 2.0 is in control

The days of caveat emptor are long gone. Today's buyer is in the driver's seat in most transactions. They have an unprecedented amount of information available to them. They can buy via numerous channels. They don't even have to stick to their geography. The emphasis is back to making the customer want to buy from you. That means creating an experience that stands out from all the other options available.

### Architecting the next-generation customer journey

Omni-channel retailing, blurring the lines between online shopping and in-store transactions, has been a big trend for the last several years. IoT takes omni-channel to the next level. The future will belong to the retailer who lets go of their preconceived notions about "what shopping looks like" and embraces a new relationship with the customer. Here are a few examples.

**Beacons.** No, we're not talking about the "blue light specials" of the 1970s. Today's beacons are intelligent devices embedded in store shelves and on products that communicate with the shopper's smartphone app, alerting them to special offers on products they usually buy or that fit their profile. In 2015, Business Insider expected beacons to directly influence more than \$4 billion worth of sales in the United States and ten times that in 2016.

**The dressing room of the future.** Let's face it. Taking multiple trips to a dressing room to find the right fit is not the most enjoyable part of shopping for most of us. Together with Accenture and Avanade, Microsoft created a new concept: the Connected Fitting Room. RFID tags embedded in your clothing selections alert a monitor in the fitting room to what you have. Need a different size, color, or a pair of shoes to go with the outfit? Simply tap the monitor and an attendant brings to you what you need.



**Point of sale becomes point of service.** Many retailers are using the mobile concept to eliminate lines altogether. Instead of having a central register, attendants carry handheld POS devices throughout the store, helping shoppers find what they need, making recommendations, and ringing them up on the spot when they are ready. Even the U.S. Postal Service is getting into the act, albeit a bit more slowly than the commercial retailers. When lines are long, some post offices are equipping workers with hand-held devices that they can use for fast transactions such as buying a roll of stamps.

## Four key ingredients

So what does it take to execute an IoT strategy that has the power to transform your business? There are four key ingredients:

**Data.** Chances are you already have lots of this, but do you have the right data? For example, a retailer may have plenty of data about what customers are buying historically, but very little about who is actually visiting the store.

**Embedded intelligence.** Some businesses, especially those in manufacturing and healthcare, probably already have sensors built into the equipment they use. However, if these aren't providing the data you need, you may need to look for additional smart, connected devices that integrate with your existing infrastructure to improve insights and efficiencies.

**Applications.** Of course, you will need applications that collect and make sense of the data. For many organizations, this means software-as-a-service (SaaS) applications that you either build in-house, using platforms like Microsoft Azure, or that device manufacturers build for you.

**Intelligent devices.** Lastly, you need a way for your customers and employees to interact with the data. These are often mobile devices such as handhelds, tablets, or smartphones that run the apps. Because these applications are mobile and use the cloud platform, they can interact with the data, using it to manage operations or engage the buyer in meaningful ways from wherever they are: in the factory, in the doctor's office, or on the retail floor.

## Windows 10: the secret sauce

Chances are, you're already running Windows in-house, but Microsoft also publishes other editions of Windows that you might not even be aware of. For example, did you know that the ATM you use to make a deposit or withdraw cash could be using Windows 10 IoT specifically designed for smart devices? These versions of Windows IoT are the secret sauce that makes IoT work so well for business. Here's where you'll find devices built with Windows 10 IoT across IoT-enabled enterprises:

### Windows 10 IoT Enterprise

Windows 10 IoT Enterprise is a full version of Windows 10 with advanced lockdown capabilities that power a range of industry devices. Windows 10 IoT devices run powerful line-of-business applications and perform specialized functions in a security-enhanced, reliable, and streamlined way.

### Windows 10 IoT Mobile

Windows 10 IoT Mobile is the next generation of the leading Microsoft platform for line-of-business mobile applications built on Windows 10. Microsoft reimagines a rich user experience, improving manageability and streamlining application development and collection. Windows 10 IoT Mobile increases productivity by providing a security-enhanced device experience, instantaneous application across devices, and excellent battery life to enable a variety of mobile scenarios.

### Windows 10 IoT Core

Windows 10 IoT Core is the version of Windows that is optimized for smaller, lower-cost industry devices. It is designed to power devices such as IoT gateways or micro-kiosks that run a single application. Windows 10 IoT Core extends the flexibility of Windows 10 to a wider range of specialized devices.

## Get more done with Windows 10 IoT

IT organizations have long trusted the productivity and security benefits of using Microsoft throughout the organization. The same benefits accrue to organizations that run Windows 10 IoT on their line-of-business and mobile devices, too.

**One common platform.** With one universal app platform, one commercial-ready security model, and one deployment and management approach, Windows 10 IoT makes it easier for your IT organization to manage these devices and incorporate them into their strategic plan.

**Empowered, mobile employees.** Windows 10 IoT delivers a friendly, familiar experience across a range of devices, including smartphones, tablets, handhelds, and more, making intelligent devices easy to learn and use.

**Trusted security for a modern workforce.** Windows 10 IoT introduces a number of advancements in security and identity protection, including access controls with biometrics and multifactor authentication, new ways to protect critical business information from leaks and thefts, and the ability to separate corporate and personal files on BYOD devices.

**Connected devices.** Windows 10 IoT is designed to work with the devices you already own—as well as the next generation of devices you deploy. This ensures interoperability across your device fleet and allows you to easily connect things, endpoints, and the cloud.

**Consistent device management.** Common device management tools allow you to manage all your Windows 10 IoT devices with the same tools you use to manage your PCs, smartphones, and tablets.

Are you ready to transform your business?

Visit [www.InnovateOnWindows10IoT.com](http://www.InnovateOnWindows10IoT.com) to learn more.



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<sup>1</sup> "U.S. Health Care Costs Rise Faster Than Inflation," Forbes, June 29, 2015.

<sup>2</sup> Cooper Smith, "How beacons—small, low-cost gadgets—will influence billions in US retail sales," Business Insider, February 9, 2015.