NTT DATA Services

POINT OF VIEW | DIGITAL BUSINESS

Six Must-Haves for a Successful IoT Solution

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NTT DATA

Six key points

The first three industrial revolutions boldly launched industry into the future with steam engines and factories in the 18th and 19th centuries and with computers and robots in the 20th century. Now, we as a global society are experiencing the world's fourth industrial revolution, Industry 4.0, where the Internet of Things (IoT) is transforming the way we do business and go about our daily lives.

Forecasters predict that by 2020 IoT will include approximately 30 billion connected things, such as smartphones, wearable sensors, sensor-embedded machines and other products.[1] By 2025, the economic impact of IoT will be around $11.1 trillion, which is 14% of today's global gross domestic product (GDP), according to the McKinsey Global Institute.[2]

As the world experiences this vast revolution, NTT DATA's goal is to stay ahead of the curve and set the pace. We thrive on understanding what's driving IoT successes and failures, and on creating seamless processes that result in successful IoT solutions for our clients.

Many companies now realize there is an important decision to make: Embrace IoT or be left behind. But before moving forward, it's essential to have a well-curated IoT strategy in place.

NTT DATA has come up with **six key points** for creating successful IoT solutions:

- **Seamless experience**. Removing roadblocks and friction during the experience.
- **Scalability**. Ensuring your IoT solution scales across physical and digital platforms.
- **Security**. Knowing your stakeholders are secure, both physically and digitally.
- **Sensible business case**. Knowing your IoT solution is based on business sense and not hype.
- **Standardization**. Creating a world where all devices are "smart and connected."
- **Sustainability**. Creating solutions that are future-focused and responsible.

Seamless experience

It's not necessarily what the "thing" itself does that makes IoT so enticing, it's what that thing does for us. When IoT engineers, developers and innovators look at technology, we often forget there are things the user would prefer to not have to deal with anymore. For example, using a keyboard when you can instead command technology with your voice led to the rise of voice-activated IoT technology such as Apple's Siri, Amazon's Alexa, Microsoft's Cortana and Samsung's Bixby.

The further we push out the current technological landscape, the closer we are to embarking on the possibility of no longer having to use cell phones or keyboards at all. Instead, we can reasonably envision a reality where we speak and gesture our various IoT technologies into action.

Technologies like Google Glass will no longer be for techies; they'll be a part of our everyday experience. We'll only have to look ahead, quite literally, to have all the information we need before our eyes — and everything we want and need at our fingertips.

At NTT DATA, we're working to develop solutions that give workers the ability to seamlessly interact with their environment using natural language and gestures. We believe this type of technology will soon become standard for the modern-day consumer, just another part of our quest to create a seamless user experience.

Scalability

Like a living organism, an IoT solution must be able to "grow" within its environment so it can adapt to users' needs, now and in the future. This is where scalability comes into play, especially within the enterprise.

We can apply our talents to developing the most ingenious IoT solutions, but if they're unable to scale when necessary, our efforts will fail and be wasted. The problem many IoT developers face is that even with solid IoT concepts in place, the platform they're using can't scale as required.

In our modern technological ecosystem, it's common to see millions of messages per second exchanged between thousands or even millions of devices.

At the World Economic Forum Annual Meeting held in January 2018 in Davos, Switzerland, numerous reasons were given as to why most IoT projects haven't rolled out at large scale. In this case, a large-scale project is defined as any IoT project affecting at least one million people, involving several industries and rolling out across a continent.[3]

"On the technical front, interoperability challenges with equipment slow down scalability, as do different IT back-ends. On the commercial front, the budgets for sustainable IoT implementations are currently extremely limited, because they mostly come from company funds related to 'innovation and digital projects.' It will be some time before mainstream business P&L [profit and loss] budgets — which are substantially larger — can convert these small implementations into large-scale deployments," noted one article from the Forum's meeting.[3]

NTT DATA employs the support of popular IoT technology platforms such as Intelligent Data Services (IDS) and ThingWorx to help navigate scalability within our customers' IoT projects.[5] Both platforms provide excellent tools for embedding advanced analytics capabilities into smart, connected solutions and helping our customers analyze and understand the data collected from connected devices. This helps you understand how users are interacting with your IoT solution, what might happen next, and what you can do to change the outcomes.

NTT DATA incorporated ThingWorx analytics into our IndyCar project, in which we monitor our NTT-sponsored drivers' biometrics (for example, heart rhythm and muscle activity) while they're behind the wheel. We did this using hitoe™, a bio-electrode conductive nanofiber fabric that is infused with polymeric compounds that transmit bio-signals.[4] Using ThingWorx, we contextualized the biometrics with data from the race car to deliver insights for more effective sports training and to monitor our drivers' physical conditions, stress levels and more.

Security

The more connected our world becomes, the more opportunity there is for cyber-physical threats. Having your applications, networks, devices and equipment secure is not an option, it's a requirement. However, when it comes to true IoT security, a typical IT department strategy with "bolt-ons" to address IoT won't cut it. It's important to have a skilled team of security experts who will help you to design processes to lock down your security profile with respect to IoT.

As the harrowing Mirai Bot fiasco of late 2016 shows us, it's essential to have solid analytics that alert you to suspicious patterns. We work closely with our sister company, NTT Security, to provide advanced analytics so we can see the difference between normal traffic and malicious or suspicious activity. The M2M Alliance, based in Germany, is calling for uniform standards and more certificates and, through them, the ultimate elimination of insecure devices.[6]

NTT Security is the first group in the industry to offer management and monitoring on both operational technology (OT) and information technology (IT) at the same time to protect not only your OT and IT, but also your IoT solutions. Because many attacks on OT come from the IT side, it's important to be able to track them to take action quicker. From a factory device to a wearable to HVAC in a commercial building, you need to protect both sides. Do you have experts you can trust in your corner?

Sensible business case

Your IoT project may be seamless, scalable and secure, but is it sensible? Although IoT solutions are, in and of themselves, smart, innovative and connected, they must, most importantly, successfully connect with the consumer. These solutions need to be easy to understand and use, and consumers must see value in them.

For example, insurance companies selling connected home solutions found that less than 25% of their customers would take the products, even when offered for free, because they don't trust them. We don't want this fate happening to your IoT solution.

Whatever the reason behind your IoT project, it's important to take a hard, honest look at your IoT solution from a business perspective long before it goes to market. With NTT DATA as your partner, we'll ask the right questions and help you adjust your roadmap accordingly. We leverage a design thinking strategy to help our customers build sensible business models that propose value based on facts and human needs and wants, not industry hype.

Standardization

The future potential of IoT is to create a world where all devices on the market are connected — from wearables to household appliances to industrial machines. In this evolving culture, interacting with connected devices will be the standard, not a differentiator.

What currently makes a device connected is its ability to effectively communicate with consumers to make their lives better in a specific way. However, the ultimate advancement of IoT lies in the ability for these devices to also effectively communicate with each other, revolutionizing industries such as healthcare, transportation, retail, hospitality and manufacturing.

Unfortunately, one significant hurdle is blocking the path to this ultimate advancement: the lack of global standards for IoT development. Perhaps, more precisely, there are too many standards, globally.

Although most of the smart devices on the market today speak to consumers effectively, they can't talk to each other, because they don't speak the same language. The reason: IoT engineers, developers and innovators use a wide range of customized, proprietary technologies and protocols that all speak unique languages; they aren't interoperable.

Incompatibility creates buggy technology and causes companies to remove attractive features (for example, disabling the Nest Protect smoke alarm's popular "wave your hand to turn off the alarm" feature).[7] What's worse, consumers end up with IoT solutions that are no longer supported at all (like the Revolv home hub), leaving early adopters feeling angry and betrayed — and with equipment they can only use as a doorstop.[8]

Many IoT solutions that thrive in a pilot environment struggle to see the same success in production, often due to the hidden costs associated with the lack of standards.

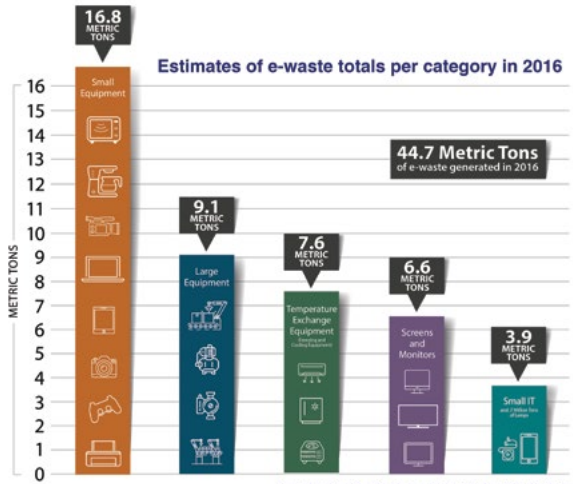
As with anything worth building, we must start with a solid foundation. Like the very technologies we create, the way we approach IoT also needs to be smart. We not only need to interact with our consumers, but we must also be able to interact with each other by speaking the same IoT language. Standardization is important, but until we change the way we approach IoT development by embracing global standards, we won't experience IoT's full potential. At NTT DATA, we're doing our part by actively championing global standards such as the ROOF Computing Model sponsored by the IEEE.

In this evolving culture, interacting with connected devices will be the standard, not a differentiator.

Sustainability

Focusing on sustainability may help reduce the raw materials we need to produce the devices and equipment we depend on — as devices become more interconnected, less production will be required. However, millions of devices, of varying degrees of usefulness and quality, have swarmed the market in the last 10 years. The pace is expected to continue. By some accounts, there is a global industrial component shortage, brought on to some extent by the hype of IoT. Much of the same raw material needed to build a high-quality, industrial-grade resistor is also used by lower quality general-purpose resistors.

On the other side of the coin, IoT has the promise to greatly reduce raw material demand in many areas, such as household appliances, large machinery, lighting and more, because it helps us produce smart devices that alert users to required maintenance and impending failures. This helps reduce complete disposal (which fills landfills with complete appliances, machinery and more) over smaller parts replacement.



Estimate of e-waste totals in 2016 per category[9]

Following the 2018 annual meeting of the World Economic Forum, it was reported that the projected growth of IoT could change the game in the global sustainability and that most current IoT projects can contribute to achieving the sustainable development goals set by the United Nations. The impact of IoT is so large because, as its core, IoT is about measuring and remotely controlling previously unconnected things. It reaches people and objects that older technology could not.[3]

IoT research firm IoT Analytics collaborated on an analysis of more than 640 IoT deployments. It found that 84% of existing deployments can address these sustainability goals. According to this research, 75% of these projects concentrate on five sustainable development goals: industry, innovation and infrastructure (25%); smart cities and communities (19%); affordable and clean energy (19%); health and well-being (7%); and responsible production and consumption (5%). The IoT projects reviewed by this study include smart lighting initiatives in Chinese cities that cut total power output by 50% and a remote water-monitoring solution that assures clean water in areas with indigenous populations.[3]

Accelerate your digital journey with NTT DATA

At NTT DATA, we believe that delivering engaging, individualized experiences that merge the physical and digital is central to building customer advocacy and a competitive advantage. We understand that enabling amazing experiences takes continuous innovation and insights. Our focus is to help you fully engage your customers, partners and employees through intelligent insights, processes and technology for profitable business growth.

NTT DATA Services is one of the largest global IT services companies, with operations in more than 40 countries, offering an advanced portfolio of application, business process, cloud and infrastructure services to businesses and governments worldwide.

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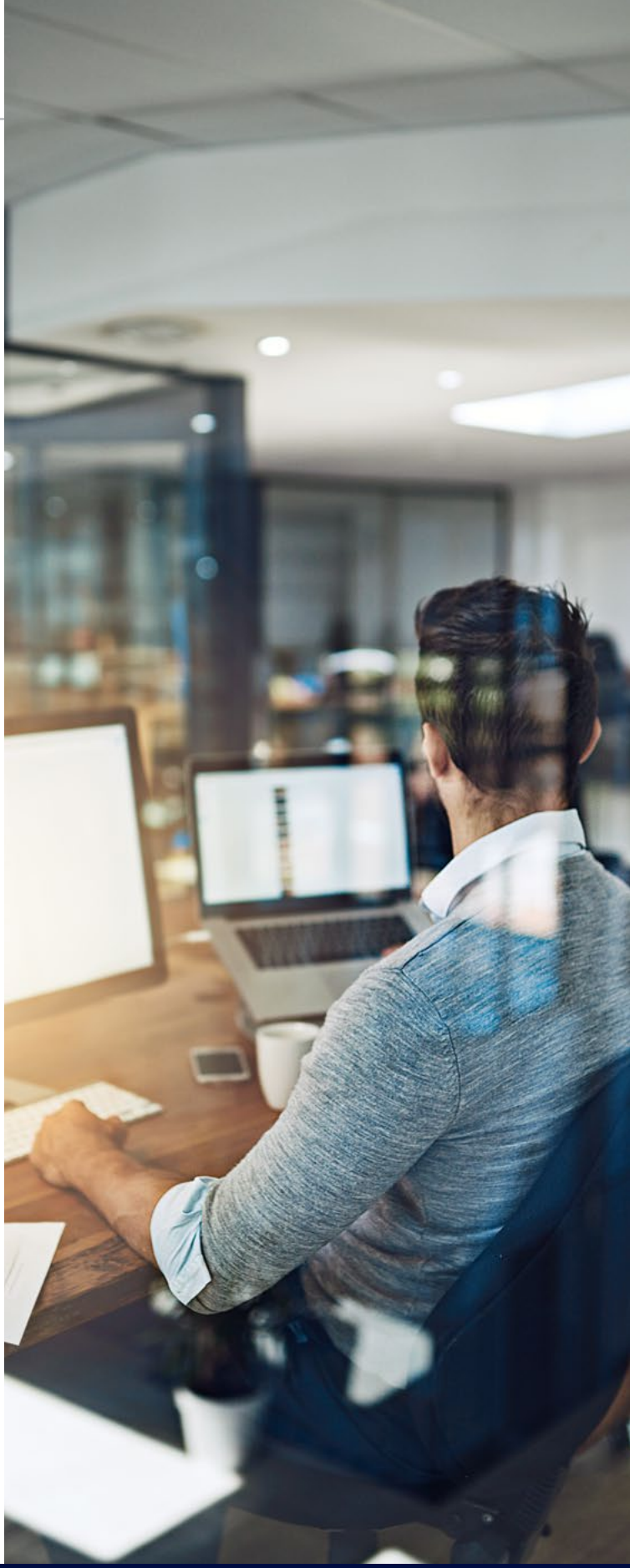

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