CDW ® PEOPLE WHO GET IT ®

# DIGITAL TRANSFORMATION: THE FUTURE OF IT ARRIVES

**Organizations can get started now** on IoT initiatives that deliver powerful business results.

## EXECUTIVE SUMMARY

The Internet of Things is here, but many organizations aren't ready for it.

While leaders across nearly every industry say they expect IoT and digital transformation to have a significant impact on their organizations and sectors in the near future, only a relative handful are actively adopting IoT technologies. Real hurdles are keeping enterprises from fully embracing digital transformation, but this disconnect between what organizations are saying about the potential of IoT and what they're actually doing to implement solutions is holding them back from realizing important benefits.

Even if organizations aren't ready to move forward with significant IT-driven changes across their entire enterprise, they must work now to develop a digital transformation strategy and pilot high-value use cases. An approach that endeavors to ''think big, act small and move fast'' can help organizations to get started.

Through IoT and digital transformation, organizations can collect and analyze data in ways that add new business value — enhancing productivity, increasing efficiency and giving them a competitive edge.

## The Time Is Now for Digital Transformation

When it comes to digital transformation and the Internet of Things (IoT), there's a disconnect between talk and action.

IoT has been a focal point of tech observers for half a decade or more, with analysts warning that organizations will be left behind if they fail to connect systems and utilize data in new and innovative ways. And indeed, digital disrupters have already upended entire industries, including retail, transportation and journalism. By 2020, Gartner estimates, more than half of all new business systems and processes will incorporate IoT in some way. And the McKinsey Global Institute predicts that, by 2025, IoT could have a global economic impact of up to $11 trillion — equivalent to around 11 percent of the entire current world economy.

And yet, for most traditional organizations, adoption of IoT and digital transformation initiatives has been relatively slow. According to IDC, only around 10 percent of U.S. businesses have IoT initiatives in production across the enterprise, with just over 25 percent of organizations saying that IoT is in production within *any* of their business units or departments.

For many organizations, IoT and digital transformation seem to be perpetually "just over the horizon." When The Economist Intelligence Unit surveyed business leaders in 2013, nearly all (96 percent) said they expected their organizations to be using IoT in some respect within three years, and the vast majority (75 percent) said they were actively exploring IoT. But when the group conducted a new study in 2017, a majority (56 percent) of executives said that their progress with IoT was slower than they had expected, and only 6 percent said that IoT is used extensively in their internal operations.

Part of this lag is because of a skills gap. According to Network World, only 20 percent of technology professionals say they have

# 30-40 percent
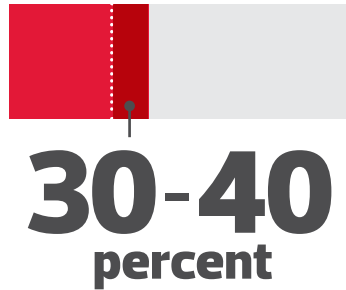
The potential increase in employee motivation because of end-to-end IT modernization[1]

the skills needed to successfully implement their organization's planned IoT projects. Some organizations are still waiting for connectivity standards to sort themselves out. And other enterprises cite challenges ranging from security concerns to a simple inability to identify practical business use cases.

## The Power of Digital Transformation

These obstacles are real, but companies do themselves a disservice by not actively looking for ways to overcome them. Some business leaders may be reluctant to move forward with IoT because they don't know where to start (and certainly, the phrase "business transformation" can seem daunting, as though organizations are expected to change their entire operations all at once). But the truth is, the implementation of IoT and digital transformation is an evolutionary process, not a revolutionary leap. And the analysis and insights produced by these efforts can help organizations move from hindsight, to insight and eventually to foresight — giving them the ability to solve problems before they even arise.

It can be tempting to dismiss such hypothetical benefits as mere lofty rhetoric. Enterprise IT shops are busy, and it's often difficult for organizations to justify spending scarce resources on technology use cases that have yet to fully prove their value in a real-world business setting. However, observers and analysts point to hard data about the benefits of digital transformation and IoT. According to the MIT Center for Digital Business, for example, companies that have embraced digital transformation are 26 percent more profitable than their average industry competitors, and also have a 12 percent higher market valuation. And a quick glance at recent business history shows that failing to take action can be far more costly than experimenting with new solutions.

## What's the Difference Between Digital Transformation and IoT?

The terms "digital transformation" and "Internet of Things" are often used interchangeably; but in fact, IoT is a subset of digital transformation.

**Internet of Things:** IoT refers to the convergence of information technology (IT) and operational technology (OT). In IoT systems, sensors gather data on real-world conditions (such as temperature or location) and integrate it with the IT world, running the information through analytics engines to produce fresh insights. This integration enables more comprehensive monitoring and management of remote systems, which can significantly boost productivity, efficiency and innovation.

By networking OT devices, organizations can improve and speed up existing processes, or even develop the technology needed to create and support new business models.

**Digital transformation:** The broader concept of digital transformation refers to the use of technology and digitization to profoundly transform an organization's business operations. Digital transformation initiatives can help deliver value on several levels: operational efficiency (meaning that the organization performs tasks more efficiently than before); business differentiation (meaning that the organization improves its operations so significantly that it gains a noticeable edge over its competitors); and business disruption (meaning that the organization enhances business practices so radically that an entire industry is transformed).

Imagine, for example, if New York City's largest taxi companies had banded together to develop a ride-hailing mobile app, rather than waiting for a Silicon Valley startup to take over their industry. Imagine if major publishers had championed e-books instead of allowing an online retailer to practically invent the medium. Or imagine if the world's largest video rental chain had pioneered digital media streaming, rather than scrambling to react after a DVDs-by-mail company had already established the market. Not only would these companies and industries have prevented their own obsolescence, but they also would have captured billions of dollars in new value.

That's the potential power of digital transformation.
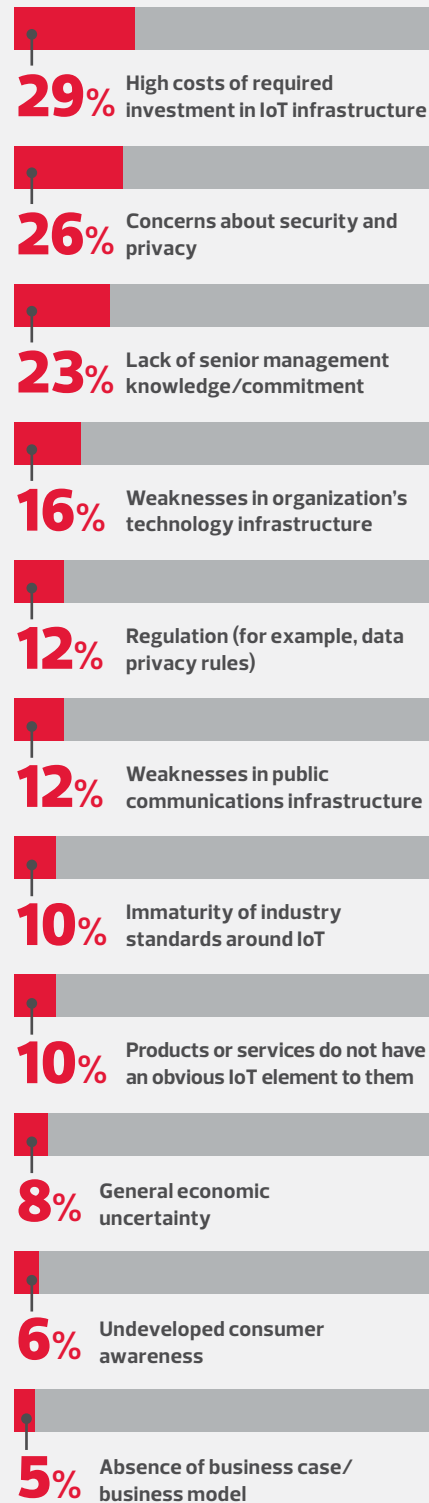
## Achieve Digital Transformation

Digital transformation isn't a switch that can be flipped on instantly. Every business pursuing a digital transformation strategy sits somewhere on a continuum of implementation and adoption, and most sit at the starting end of the continuum.

IDC identifies five levels of digital transformation maturity, categorizing organizations with ranks ranging from "digital resister" at the bottom to "digital disrupter" at the top. For business leaders who feel that their organizations haven't made progress on digital transformation and IoT initiatives as quickly as they would like, it may be comforting to know that only 5.8 percent of companies find themselves in this upper echelon. Nearly two-thirds (63.2 percent) of organizations are classified as either "digital explorers" or "digital players" — the second and third steps, respectively, on IDC's five-step digital transformation journey.

Many organizations have adopted a "think big, act small, move fast" approach to digital transformation because it works. This approach can help organizations to create a blueprint that breaks the digital transformation process into small, achievable steps while still allowing

## IoT Adoption Hurdles

Business leaders cite the following factors as the chief obstacles to IoT implementation (Respondents were asked to select as many as two factors.):[2]

**29%** High costs of required investment in IoT infrastructure

**26%** Concerns about security and privacy

**23%** Lack of senior management knowledge/commitment

**16%** Weaknesses in organization's technology infrastructure

**12%** Regulation (for example, data privacy rules)

**12%** Weaknesses in public communications infrastructure

**10%** Immaturity of industry standards around IoT

**10%** Products or services do not have an obvious IoT element to them

**8%** General economic uncertainty

**6%** Undeveloped consumer awareness

**5%** Absence of business case/ business model

organizations to aim high.

**Think big:** This is the fun part. As business leaders set a long-term vision for their digital transformation strategies, they should consider "dream scenarios" for how IoT and other technologies might improve their business, create a competitive edge and even disrupt their industries. Of course, changes to the marketplace and technology will mean that some initial goals may ultimately prove to be impractical or even irrelevant, and organizations will need to adapt their initial visions based on the lessons they learn as they proceed. But by taking the time to think big at the beginning, business leaders can help ensure that their digital transformation and IoT efforts deliver results that are worth the effort.

**Act small:** Organizations starting out with new technologies should focus their early efforts on "quick wins" or "low-hanging fruit" — manageable projects with proven use cases. When these early experiments achieve business goals and result in a positive return on investment, they naturally create internal support for future digital transformation and IoT projects. While organizations pursuing digital transformation initiatives must be willing to tolerate some level of risk, these risks are likely to be met with less internal skepticism if senior executives have already seen tangible results from earlier efforts. When businesses are just getting started, a knowledgeable partner can often help provide expertise that many organizations lack. According to research conducted by Cisco Systems, 60 percent of business leaders say that IoT projects typically prove to be more complex than expected. And 58 percent of the most successful organizations engage technical consulting or support at every stage of IoT initiatives.

**Move fast:** In virtually every industry, established, effective IoT solutions have already arrived in the marketplace. Once organizations have developed a larger digital transformation strategy and have taken initial steps to put their plans

into action, they should take their newly acquired internal knowledge and apply it to more of these use cases — eventually tackling larger and more transformative projects that have the potential to help fulfill their initial "think big" strategic visions.

## The Technologies That Power Digital Transformation

Digital transformation and IoT efforts require more than organizational commitment. They also necessitate new investments in supporting technologies. These include:

**IoT gateways:** These solutions, which can be either physical devices or software programs, compile data and make sure that data traffic is transmitted to its intended destination. By serving as a connection point between the cloud, controllers, sensors and intelligent "things," IoT gateways link together systems that previously couldn't communicate with one another.

**Networks:** The network can make or break an IoT initiative. In fact, according to IDC, network readiness is one of the primary obstacles to digital transformation, and efforts to increase network readiness can yield between $188,000 and $745,000 per 100 users per year in new value. New networking technologies have emerged to connect remote sensors and other IoT components, including edge processing, data centers and the cloud. "Data fabric," which creates a platform to support the storage, processing, analysis and management of disparate data, is an emerging concept in IoT.

**Sensors:** IoT sensors are getting smaller, less expensive and less power-intensive, increasing the number of ways in which they can be deployed. While much of the value of digital transformation comes through organizations better analyzing and managing the data they already have, sensors help enterprises to collect — and connect — information in countless new ways. Temperature sensors are helping to optimize energy use in buildings, and also to alert maintenance or IT staff about overheated equipment. Pressure sensors, optical sensors and proximity sensors are all also

commonly used in IoT environments.

**Security:** New data means new targets for hackers. The expansion of IT into the physical world of IoT creates a vast number of new vulnerabilities for cyberattackers to exploit, and organizations should consider a number of approaches to addressing these threats. For one, enterprises should segment their networks to ensure that IoT-connected sensors and devices don't provide hackers with a pathway to sensitive data from other IT systems. But also, organizations must take basic (and often overlooked) security steps, such as researching the security features of all IoT devices before introducing them and changing default logins and passwords.

## Digital Innovation in Action

As enterprises look for effective, manageable entry points into digital transformation and IoT, they should consider use cases that have proven effective for organizations in their industries. Here are some of the most common — and valuable — ways that businesses are already adopting innovative solutions.

**Energy management/smart buildings:** This is a use case that can apply to organizations in practically all industries, as every dollar that can be saved from reductions in heating, cooling and water usage can be reinvested in the business. Additionally, many organizations undertake ambitious energy and water conservation efforts, and smart building programs can also increase worker comfort. According to Intel, a smart building program can cut energy costs as much as 8 percent in the first year of implementation, with annual savings reaching up to 30 percent in subsequent years.

**Predictive maintenance:** With connected sensors, organizations can continuously monitor the condition of high-value and mission-critical equipment for signs of imminent failure, and then either proactively perform repairs or replace the equipment before it malfunctions. This not only decreases maintenance costs, but it can also prevent productivity losses by minimizing equipment

## Why Security Is Essential

The prospect of cyberattackers taking hold of customer data or intellectual property already keeps security professionals up at night. Now, they have to worry about hackers taking control of door locks and car brakes.

The following real-life breaches illustrate why security must be a top concern for any organization deploying IoT solutions.

**Mirai botnet:** In 2016, the Mirai botnet attack on IoT devices such as older routers and IP cameras enabled hackers to launch a distributed denial of service attack on a domain name system provider, temporarily taking down a number of prominent websites, including Netflix, Etsy and Twitter.

**Finland heating attack:** Also in 2016, cybercriminals breached unprotected building management systems at two apartment buildings in the Finnish town of Lappeenranta, knocking out heat to the buildings for more than a week.



**Hacking pacemakers:** Although this breach occurred in a research setting, it is perhaps the scariest of all: In 2017, the Food and Drug Administration confirmed that implantable cardiac devices such as pacemakers and defibrillators were vulnerable, with hackers able to deplete batteries or even shock patients. The manufacturer of the device quickly implemented a patch, but the case showed the deadly potential of IoT breaches.

downtime. Predictive maintenance is an especially important IoT use case for industries (such as the gas, oil and energy sectors) that require organizations to operate in remote environments where maintenance is a major challenge.

**Predictive analytics:** As organizations collect and analyze more data, they are finding ways to use this information to forecast vital variables such as customer needs and product demand. Better forecasting can help enterprises to get ahead of the market with their offerings, and can lead to manufacturing schedules, marketing campaigns and pricing strategies that allow them to match the type and quantity of their products and services to changing conditions on the ground. The data needed for effective predictive analytics programs can be gleaned from IoT components, including video feeds, mobile geolocation, social media channels and log files.

**Video surveillance and monitoring:** Many businesses have utilized security cameras for decades. But by connecting IP–based cameras to the network and applying analytics tools, organizations can automate existing processes and arrive at valuable new insights. Many states and cities already use camera systems to automate processes such as speed–limit enforcement and toll collection, and analysts foresee a future in which cameras are able to use facial recognition and other intelligent features to make "decisions" on their own. For instance, public street cameras might one day automatically dispatch first responders after an automobile accident.

**Real–time location tracking:** Tools such as radio–frequency ID tags and mobile beacons can track people and assets. These

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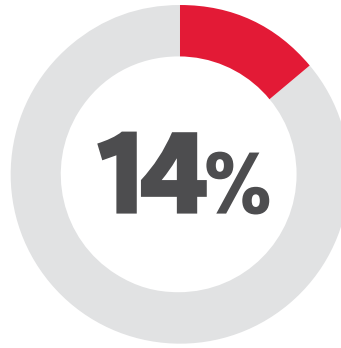
The percentage of business leaders who say they "strongly agree" that their organizations are moving beyond IoT pilot programs, into full–scale enterprise deployment[3]

solutions are often used in the retail sector, as well as in other settings where inventory management is a critical concern. In retail, the simple act of keeping the right products in the right place on the shelf so that they're available for customers to purchase can prove deceptively difficult. And when retailers make mistakes in this area, it often costs them sales and has a negative impact on the overall customer experience. According to the International Council of Shopping Centers, 41 percent of shoppers want stores to provide interactive shelves that give product information, and 36 percent are interested in in–store tablets that show a larger offering of products to purchase.

**Worker safety:** According to the International Labor Organization, workplace accidents account for 320,000 deaths each year, with nonfatal accidents numbering more than 300 million annually. IoT–connected wearable devices, including helmets and wristbands, can help prevent these incidents by collecting biometric, environmental and geolocation data and sending real–time alerts to employees and managers if workers' well–being is compromised. For example, wearables can help ensure that workers aren't exposed to excessive levels of heat, cold, radiation, noise or toxic gases.

**Smart cities:** By connecting and gathering information from systems — including traffic signals, parking infrastructure and light poles — cities and towns are saving money and improving services for residents. For example, Chicago developed an algorithm to prioritize health inspection for restaurants with previous violations, and Kansas City is using sensors along a 2.2–mile streetcar line to gather and disseminate real–time information about traffic volume and open parking spots.

## IoT in Action

Across industries, pioneering companies are transforming their operations with Internet of Things initiatives.

**Smart factory:** Food manufacturer SugarCreek outfits employees with RFID–tagged bump caps, generating workflow productivity data and ensuring that workers can be located during an emergency. The company also uses a network of 260 video cameras to allow remote employees and partners to watch operations and assist with maintenance from offsite locations.

**Inventory visibility:** Intel partnered with clothing manufacturer Levi's for a proof–of–concept inventory monitoring system at the San Francisco Levi's store. RFID tags are placed on every item in the store, with data

readings forwarded to Intel gateways and then pushed to back–office systems for cloud–based analytics. The store now has nearly 100 percent visibility into what is on the shelf and what is running low, potentially reducing inventory carrying costs by as much as 10 percent.

**Real–time health monitoring:** CDW, Intel and data science company Big Cloud Analytics partnered to introduce wearable devices and tablets at four senior care communities. The connected tools helped care providers to see indications of health problems before residents complained of symptoms. For example, in the four days before one woman was hospitalized with pneumonia, her activity level decreased by 70 percent.

While each of these use cases is valuable on its own, the real power of IoT and digital transformation comes when organizations are able to combine several different IoT systems. For instance, public safety departments on college campuses might pull data from a number of IoT-connected sources — including security cameras, smart lighting systems, incident reports and perhaps even Wi-Fi access points — to deliver officers real-time information about changing conditions via a custom mobile app. Retailers might use mobile beacons not only to ping customers with special offers, but also to create foot-traffic heat maps and optimize store layouts. And cities and states might use connected traffic signals not just to streamline the flow of traffic, but also to inform infrastructure improvements and changes to the deployment of public safety workers.

Likely, many of the IoT use cases that will have the largest impact on the business world haven't even been dreamed up yet. Organizations that start pursuing their digital transformation strategies now will have an advantage over their competitors.

## CDW: An IoT Partner that Gets IT

The Internet of Things (IoT) is no longer the stuff of science fiction, but rather a complex, growing set of solutions that can lead to greater productivity, higher profitability and better decision-making. However, because IoT technologies are so new, very few organizations have the in-house expertise needed to make these solutions come alive in a way that truly creates business value. In order to successfully design and deploy digital transformation solutions, enterprises must develop a strategy that allows them to connect and streamline their technology systems for fast, secure access to data across multiple platforms.

CDW can help.

Across industries, CDW is helping organizations to orchestrate digital transformation strategies that allow them to leverage all of the new data that IoT provides, while also reducing the burden on internal IT staff. With in-house IoT experts and best-in-class technology partners, CDW can assist enterprises with translating their business goals into an achievable technology roadmap.

In a full- or half-day IoT Envisioning Workshop, CDW's experts engage business leaders in preplanning discussions, assess how existing infrastructure addresses goals and challenges, brainstorm new IoT solutions and design a realistic timeline for implementing digital transformation initiatives.

## The CDW Approach

**ASSESS**
Evaluate business objectives, technology environments and processes; identify opportunities for performance improvements and cost savings.

**DESIGN**
Recommend relevant technologies and services, document technical architecture, deployment plans, "measures of success," budgets and timelines.

**DEPLOY**
Assist with product fulfillment, configuration, broad-scale implementation, integration and training.

**MANAGE**
Proactively monitor systems to ensure technology is running as intended and provide support when and how you need it.

**To learn more about digital transformation, visit CDW.com/DigitalTransformation or schedule a consultation with a digital transformation expert at 800.800.4239.**

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