THE DIGITAL TRANSFORMATION INSIGHT REPORT
Orchestrated by CDW

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WELCOME TO THE AGE OF DIGITAL TRANSFORMATION
Digital transformation is here. And it’s easy to see why. While most organizations undertake digital transformation to gain operational efficiencies and cut costs, they’re seeing top-line growth, too, as technology continues to improve the customer experience. But despite these and other benefits, digital transformation can seem daunting for many companies. Knowing where to begin, what to execute on and how to extract value from their investments are all big questions that organizations must grapple with along their journey.

“Digital transformation is more than technology. It’s how that technology is harnessed to improve business models, to gain operational efficiency and revolutionize the customer experience. And that’s just the beginning.”

First, it's worth noting what digital transformation is. At its core, digital transformation is a business-first approach to helping organizations accelerate the transformation of their business model through the use of technology to achieve the organization’s goals.

Digital transformation often includes gathering new information from the environment and the physical world that wasn’t previously available, and then using those insights to inform better business decisions. That connecting and
instrumenting everything around us — the melding of the digital and physical worlds — is the Internet of Things (IoT).

In some circles, digital transformation and IoT are used almost synonymously because of the significant value that this new connectivity and information bring to the transformation process. But the connectivity IoT brings is not the goal, rather it’s a key enabler and a major subset of digital transformation.

Digital transformation is more than technology. It’s how that technology is harnessed to improve business models, to improve operational efficiency and revolutionize the customer experience. And that’s just the beginning.

Digital transformation comes with myriad benefits that organizations have just started to realize. For example, in retail, real-time location systems can help a business track its customers, assets and inventory. This solution not only helps customers find what they need, it also helps that business become more efficient while increasing its ROI. On the factory floor, adding sensors can make processes more efficient as analytics provide information that can predict failures before they happen, which significantly reduces downtime. With connected devices providing these types of insights, the possibilities are endless.
But those possibilities aren’t always easy to harness. Effective digital transformation is complex, and a number of challenges must be addressed:

First and foremost, an organization must do the hard work of analyzing the business and developing a vision and goals for what transformation looks like for them. It takes top-down executive commitment to lay out a strategy and stay the course through what will probably be a multiyear journey.

Transformation must also include all aspects of an organization’s IT infrastructure and other operational technologies that are currently disconnected from the traditional IT environment. To be truly effective and maximize results of digital transformation, an organization’s information technology and operational technology must be connected and fully integrated.
Finally, digital transformation usually involves new partnerships and skill sets that the organization hasn’t needed before. Adding new sensors and analytics capabilities, appropriately addressing security concerns, and finding resources with the skill and experience to tie it all together and deliver the desired outcomes are some of the challenges.

To address these challenges and turn the promise of digital transformation into reality, organizations need to think big, act small, and move fast. This means identifying where they want to go from the get-go, determining how big the gap is between their current technology and big vision, picking a starting point everyone can get behind, and then moving ahead aggressively to prove the value of their first solution and realize their first results in the near term.

“To address these challenges and turn the promise of digital transformation into reality, organizations need to think big, act small, and move fast.”

Successful digital transformation involves bringing key stakeholders together to determine a focus, and then relying on outside expertise with the skills that complement your internal capabilities. It may mean choosing a strategic partner that can help you orchestrate all the moving parts, cut the
complexity, and help identify and implement different solutions. Attempting to go it alone in-house can bog down teams, slow business process and result in leadership constraining further investment.

No matter where organizations start or how far along they are in the process, this guide is designed to take insights from the best minds in the industry and combine them with data garnered from over 400 IT leaders across the world. Its goal is simple: to help organizations accelerate the transformation of their business models in a manner that improves operational efficiency, enhances the customer experience and creates differentiation that helps grow sales. I hope the research, ideas and best practices in this guide will help change the way you think about and approach technology in the age of digital transformation.

Link Simpson
Senior Manager, Digital Transformation & IoT, CDW
Perspectives

Digital transformation has become a central force behind changing business models. While it’s true that digital transformation may be replacing humans wherever technology can work more efficiently, it’s also empowering us in brand-new ways. Organizations are becoming more efficient, safer and savvy. Armed with data and insight, they are finding new ways to reinvent themselves. Governments are better serving and protecting their citizens. And customers are finding new reasons to shop.

To help organizations harness the power of digital transformation, we have asked some of the best and brightest minds within the industry to identify some of the biggest trends impacting different industries today. By looking at digital transformation on a case-by-case basis, we can better understand its benefits along with specific challenges. Their expert perspectives, along with ours, are included here.
The research conducted by IDG for this guide was eye-opening in many respects. If anything, it shows that digital transformation is well underway. But interestingly, the data also indicates that a large percentage of organizations are either struggling to get started or stuck in endless proof-of-concept exercises.

While we all agree that digital transformation is a key to driving business outcomes such as opening up new revenue streams and improving operational efficiencies, it can be a massive undertaking. And understandably, starting and getting stuck will happen. And it happens often.

However, a simple framework can help organizations begin their efforts or continue them once in motion.

Our approach is anchored by this guiding principle — *Think Big, Act Small, and Move Fast*. It’s a simple concept that is not meant to downplay the complexity of digital transformation, but rather to help with acceleration of the process and increase the chance of success.

We have applied this principle in our work with hundreds of clients, and it works beautifully. It helps organizations achieve their vision by establishing a clear objective and roadmap for success.
Think Big
Successful digital transformation hinges on thinking big. The reason is simple. If organizations truly want to transform, they need a clear vision of what they want to transform into. That requires thinking big to envision what is possible, and then refining that vision into a specific end state and its associated business outcomes. Identifying the end goal will help determine the steps you take to get there.

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Take a smart, connected city, for example. It’s built with smart sensors, devices, infrastructure and software all working together to deliver enhanced city services such as smart street lighting, smart parking, and intelligent roadways. The cities who do it right are
those who have a clear vision of what they want their community to look like from the get-go. The data shows that successful smart cities attract and retain their populace at a higher rate than their peers, show higher tax revenues over time, and experience improvements in public safety. These are clear, measurable outcomes.

The same applies to businesses. Instead of focusing on generic goals like becoming “innovative” or “efficient,” focus on identifying measurable business outcomes you want to drive and then target specific use-case scenarios. For example, all manufacturers strive to maximize operational efficiency and production outputs. Equipment downtime — both planned and unplanned — is a key metric that factors into that efficiency. Consider the possibility of deploying IoT sensors that monitor machinery operating parameters such as vibration, heat and electrical consumption. Data analytics can help identify variance in those parameters as an early warning indicator, before they become big issues or outages. Using that data to inform proactive maintenance procedures can result in greatly reducing downtime and maintenance costs versus traditional preventive or reactive approaches.

Bottom line — envision how your organization could use a digital transformation strategy to gain tangible results far above and beyond the status quo. Accomplish that, and you’re thinking big.

**Act Small**

You can’t boil the ocean all at once. The same goes for digital transformation, which can be daunting, complex, and often plays out over a period of years. To help tackle it all, organizations need to act small, and that means developing a clear roadmap of initiatives with finite scope and measurable results that build up to the desired end state.

Acting small usually starts with focusing on low-hanging fruit use cases and proven solutions. Identify what’s achievable and measurable in short order and pursue those opportunities as a priority. It’s attractive to go after the big, lofty goals with an ambitious, custom-developed architecture, but doing so often traps organizations in a constant cycle of proofs-of-concept — a wildly expensive and fruitless effort. Focus on achieving small wins that build momentum and support for the long-term investment that is your multiyear transformation strategy.

We often recommend solving a single challenge first with a proven solution that drives immediate results. Recently, a manufacturing company wanted to implement a series of transformative processes across all their plants on a global basis. Instead of tackling the entire project scope at once, we identified a single use case to start with — an energy management solution. Rather than try to sell the concept across a global constituency of plant managers, we started with a “proof of value” pilot on several production lines in a single factory.

It quickly showed that IoT technologies delivered clear and immediate insight into operations, without disrupting production. Proving that the solution worked as advertised gave them the confidence to move forward globally with this and additional IoT solutions on the factory floor.

**Move Fast**

Once you have established that big vision and the small, measurable steps
to realize that vision, it’s imperative to move fast. Moving fast comes down to executing following your roadmap with a sense of urgency and demonstrating the ROI of your initiatives early and often. The reason is simple. If you can prove to the organization that digital transformation is driving real results, momentum and company-wide buy-in will follow.

The Role of IT in Transformation
All of this requires IT to think more like a solution enabler within its own organization than just an infrastructure provider or gatekeeper. If IT does not take on the role of a change agent, the line of business will go around them. If you’re too slow or rigid, there are plenty of providers out there building fast, efficient as-a-service technologies — and they are more than happy to sell directly to line-of-business leaders without your input.

Does this sound familiar? A line-of-business executive comes back from an industry trade show raving about some obscure and unproven technology vendor with a savvy sales pitch. IT is then put on the defensive, either forced to play catch-up or argue why that solution is incompatible with the existing infrastructure or security posture. This effectively slows down the rate of innovation or transformation of the organization to a crawl and it is perceived that IT is the problem. In contrast, truly effective digital transformation happens when IT develops a business-
first mindset, looks into the market ecosystem, and proactively brings viable new solutions forward.

**The Time Is Now or Never**

Truly, the nightmare scenario is doing nothing in the face of inevitable disruption of your business or industry by technology or external factors. Think big, and you can choose to be your own disruptor and create positive outcomes by driving a digital transformation on your terms. Acting small and moving fast will help you accelerate the process in a way that produces clear, tangible value. IT sits in the perfect position to elevate its role to a strategic business partner and be a change agent to help the company reach new heights in profitability and reaching customers and delivering increased value to employees and stakeholders.

Conversely, you can do nothing and be caught flat-footed in the face of rapid market change and eventually get left behind by competitors that do make these investments. Ultimately, digital transformation is all about revolutionizing your business with technology to drive results otherwise not attainable by “business as usual.” The stakes are high, but a clear vision and solid plan will give you the confidence to place the right bets on your organization’s future.
Misfires, wrong turns, and dead ends. The path to digital transformation is rife with challenges. Particularly troublesome is that many organizations today must evolve or become irrelevant. Facing increased pressure to digitally transform, they rush into the endeavor without fully considering the accompanying challenges.

And the challenges are plentiful. From a lack of a clear objective to a disconnect between IT and senior leadership, getting everyone on the same page can be a difficult task. Setting and communicating clear goals on what exactly digital transformation will accomplish will help everyone throughout the business frame the endeavor within their own department. A strong business case is essential for digital transformation—one that articulates clear objectives, is supported by data and KPIs, and helps the entire organization realize the need for such an initiative, and more importantly, what it will accomplish.

But that’s just the start. Along the way, the organization will encounter both cultural and technical challenges. It’s important to remember that digital transformation is not just about technology. It’s also about change management. From top to bottom,
“If real, actual business value becomes the North Star for any strategy, there is no challenge too big to overcome. With a collective focus on a shared vision, digital transformation will ultimately become a reality.”

digital transformation pushes the entire organization toward a common goal that has a real, tangible business impact. And that means it affects change that goes far beyond IT systems. The following ideas can help IT and business leaders navigate some of the challenges that come with that change.

**Overcoming Cultural Challenges**
Digital transformation isn’t just about connecting technology. It’s about connecting people as well. Digital transformation initiatives cannot be relegated to only the IT department, nor can they include just a few other departments. Delivering on the promise of digital transformation means getting everyone on the same page and working together, outside of their traditional silos. This requires organizationwide buy-in, which is necessary to see any strategy through from beginning to end. However, inter-departmental collaboration is not always woven into the cultural fabric of many companies, and a lack of collaboration can stop any well-intentioned project dead in its tracks.
At CDW, we’ve found that envisioning workshops work extremely well to foster collaboration when building a strategy for transformation. In these workshops, we gather key IT stakeholders with line-of-business leaders to facilitate a discussion. In these discussions we ask them to lay out the business initiatives and outcomes they would like digital transformation to deliver for the organization. The conversation often identifies which business processes and departments will be affected, and how that may impact employees, tools and training. We discuss the IT infrastructure requirements, the possibilities for analytics, concerns about data storage and security, and operational support. As the workshop unfolds, all parties have a voice in defining the future state of the business, potential issues and dependencies, and the critical path of initiatives to steer the transformational process forward.

By aligning departments and helping them work together to identify the technology and key metrics that will be used to measure success, everyone leaves the envisioning workshop with a clear vision. But perhaps more importantly, they have opened the lines of communication across departments. As this newly chartered project develops, they will explore new ideas, troubleshoot issues, and come to agreements more quickly because they’re closely aligned.

But lack of collaboration is not the only cultural barrier that organizations may experience. Many organizations also struggle with the increasing generation gap within the workplace — a critical cultural component that often gets overlooked. The modern workforce is anything but uniform. It’s an amalgamation of different people from different generations. Making sure digital transformation is understood not just across departments — but across generations — can help build momentum around the organization’s digital strategy.

As an example, many industrial companies traditionally have been slow to adopt technology in parts of
their operations due to resistance or lack of adoption by older, skilled workers. Now these industries are at risk of losing decades of experience as the baby-boom generation enters retirement. Ironically, digital transformation may be the answer to bridging the gap to capture the knowledge and experience of a tenured workforce and mobilize it for consumption and use by a new generation of workers who have come of age in the highly mobile, on-demand information age.

The key to success is to identify what is needed to ensure buy-in of at-risk populations within the workforce, and offer the training or incentives needed to facilitate a change in behavior or development of new skills that may be required. Remember, digital transformation is as much about people as it is technology. When organizations exclude people from the process, they run a much higher risk of failure.
Overcoming Technical Challenges

Digital transformation can be challenging from a technical standpoint as well. The concern that arises quickly and most frequently is that of security, especially when IoT technologies are deployed to "sensorize" strategic assets or business processes. When data is collected and transferred in new ways, organizations need to take extra precautions to ensure that security is a central part of the planning, from start to finish. Additionally, digital transformation often creates a massive influx of data to be handled, especially when IoT deployments are involved. This data can provide great insight into the operations of an organization. But moving all this data from the network edge back to a data center for analysis may not technically be feasible because it could saturate network connections. Plus, moving all this data may not be necessary — some of the data being collected is more relevant to the business than other data. There are certainly ways to address this with edge analytics and fog computing, but to do so, you must have a deep understanding of the data you are collecting and how it will be used. The use case must drive the technology architecture, not the other way around.

That’s why it is important for organizations to look at data holistically while considering the impact on both IT and the business. Together, they will need to decide which key performance indicators (KPIs) are important and what the real value of data is to the organization. It’s important to outline clear expectations for which data will be measured and what it will be measured for before the technical architects begin the process of designing systems and dashboards. And security must underpin the entire plan to protect both data and infrastructure in its entirety.

It All Comes Back to Value

Digital transformation is often at the forefront of many business strategies today. IT and line-of-business leaders are being asked to work together to change their organizations internally as well as externally. It is easy to get lost in the minutiae of the conversations about infrastructure, applications and operations. Many organizations will have false starts as they struggle to execute along the way. That is why it is important to align the entire organization on the vision, the necessary steps for transformation, and the allocation of resources to aid in the transformation. In the end, if real business value is the North Star for digital transformation, there are no challenges too big to overcome.
When it comes to security, the digital and the physical have always lived in two separate realms within companies. Both operationally and architecturally, physical security and cybersecurity have existed as separate disciplines owned by different organizations. But things are changing. The digital and physical have started to cross boundaries and intermingle in ways that are benefiting businesses across different industries and different sizes.

IoT and data analytics are hot topics (and rightfully so). Together, these emerging technologies are helping us instrument our physical world, giving us more insight into operations, customer behavior, and the way organizations behave in general. And in the context of IoT, the video camera very well may be the most powerful sensor available. By combining IP-based camera systems with video analytics software, organizations are now armed with a new tool that can deliver not only hindsight (as in traditional video surveillance applications), but also insight and foresight. At CDW, we call this “Enhanced Video Surveillance.”

The great thing is that there are use cases within nearly every industry that can help companies get more value out
of combining IoT with their video surveillance investments. Retailers can use video analytics to understand customer foot traffic in the store and dwell times in front of promotional displays as well as RFID to improve inventory management and loss prevention. A manufacturer can use thermal cameras, vibration sensors, and electricity meters to monitor equipment health to detect and predict costly failures before they occur. No matter the industry, IoT and enhanced video surveillance solutions are creating insights that help organizations improve not only safety, but operational efficiency and better customer experiences too.

Throughout this article, we’ll provide examples of how different industries are using these technologies to create safer environments and improve operations. But first, it’s worth discussing what’s causing the massive adoption rate of video, as well as the factors driving organizations to consider it as part of an IoT solution.

The Two Driving Factors
In light of recent events and cultural pressures, organizations are constantly looking for new ways to create safer working environments. The evolution of IP cameras, IoT, and video analytics have opened the door for data to play a crucial role in improving safety and security. This is leading to widespread adoption that’s fueled by two key factors: physical security and the bottom line.

Traditional means of physical security might only involve one or more discrete methods of protection, whether using patrol guards, live camera monitoring, or card-based building access control. But that leaves open vulnerabilities to be exploited, whether due to human error
or someone "shoulder-surfing" through a secure door. Increasingly, organizations are looking to combinatorial means of authentication, correlating data from facial recognition, badge-readers and even mobile device IDs to ensure that two or more factors are needed to confirm known individuals – or to alert the organization when an unknown intruder is swiping a lost or stolen ID badge.

The second factor is simply the bottom line. Because video and data analytics can provide predictive capabilities, it greatly enhances an organization’s ability to tell what will happen tomorrow, so that preventive steps can be taken today. It’s the ability to both protect in the present while predicting the future that has turned it into a viable solution that’s not only making the workplace safer – but also saving organizations a lot of money in the process.

**Data Security in the Era of IoT**

Whenever we discuss the widespread use of IoT devices, information security is a concern. Any device connected to the corporate network is vulnerable, including IP video cameras. To help mitigate risks, organizations should follow cybersecurity best practices of hardening each connected device when they are deployed. And they must be properly maintained as threats evolve.

Using cameras in increasingly new ways in business operations also means putting a greater emphasis on privacy. Video data must be secured whether in flight or at rest, whether it’s stored in the video management system, in the cloud, or in some cases, on the cameras themselves. These are a few of the biggest reasons why we are seeing a trend of Physical Security teams being moved from facilities to IT departments.

**The Opportunity for Digital Transformation**

Using emerging technologies to increase insight into organizations must start with having a clear, predetermined goal. Video solutions specifically, along with IoT in general, can be key elements of a larger digital transformation strategy to deliver improved business outcomes. How could video and sensor data provide a clearer view into operations? What data will be important? How can it be measured and acted upon? Answering these questions will help harness the power of these tools to create more efficiency, less risk, and additional cost savings.
Campus safety is top of mind for faculty and campus administrators – both for K-12 school districts as well as higher education institutions. And enhanced video surveillance is providing new insight into an escalating concern.

To maximize impact, schools should think in terms of hindsight, insight and foresight. The hindsight of traditional video surveillance gives schools forensic value that lets them learn lessons from the past while planning for the future. Those same devices are also giving schools and campuses unprecedented insight into what is happening now, so they can react to threats in real time. The learnings and safety benefits that come with these devices can be applied to larger safety concerns as well as mundane, daily situations. For example, facial recognition systems can flag an unknown individual seen entering the building and automatically alert campus security to greet them and enforce visitor check-in procedures.

Foresight means using all the data and insight it’s creating to make future decisions that mitigate risk or improve student and faculty experiences. By combining hindsight, insight and foresight, schools can make an impact on their operations. But like any digital initiative, implementing enhanced video devices isn’t a one–size–fits–all solution. It must meet the specific needs of each school.
IoT is helping keep workers safe across a variety of industries, including manufacturing, oil and gas, energy, retail and hospitality. The reasons are simple. An ounce of prevention is worth a pound of cure. For example, an oil refinery that leverages sensors and analytics can foresee and mitigate unplanned outages and accidents. This saves money, can reduce the environmental impact of spills, and can save lives. No matter the industry, consider the following to help implement IoT in a way that improves safety, security and efficiency.

1. **Always Seek Proof of Concept**
   It’s easy to want to jump from idea to widespread implementation. Instead, start small with just a part of your factory floor or a single store. Prove the concept and understand how operations will be impacted first before scaling.

2. **Be Selective About Your Data**
   IoT can generate an avalanche of data about operations, but which data is important and which is just noise? Understanding what’s at stake and building a solution around that first will make a bigger impact, faster.

3. **Focus on Operational Workflow**
   IoT is relatively new across every industry. As such, it’s important to think about the end-user experience. Simply deploying technology — without accounting for operational workflow, usability, or user adoption — will not likely garner the results you’re looking for.
From safety to efficiency, IoT-enabled devices are helping local governments build more efficient cities that protect citizens while delivering cost savings at the same time.

One of the big trends in building connected cities is smart lighting. Upgrading to LED street light fixtures alone is saving cities 50% or more in energy costs to start. Taking the next step of connecting these lights with smart, networked controllers is driving an additional 30% in savings due to the efficiency that intelligent controls can create. On top of that, cities can then begin using streetlight poles as a private network for powering other smart city services, such as using cameras for pedestrian or vehicle counting, monitoring smart meters for municipal utilities, or installing environmental sensors to monitor air quality – all so that officials can use that data to make smarter, more informed decisions.

Another example – blue-light emergency kiosks on streets and college campuses. These are very effective as a means to improve public safety. But they’re also incredibly expensive to install and provide localized benefit. Connected streetlights, on the other hand, could enable ubiquitous coverage at a fraction of the cost. A great example is CIMCON’s Blue Light mobile app. If a citizen or student needs emergency assistance anywhere, the tap of a virtual button automatically alerts authorities of their physical location while automatically increasing the illumination.
of nearby streetlights or flashing them to draw attention to the area. This dramatically increases public safety while decreasing costs by leveraging the existing smart lighting infrastructure.

More and more, state and local governments are realizing that safety and efficiency go hand in hand. An unsafe city isn't good for the economy or public sentiment. But using IoT to create a truly smart city takes the right planning and execution. Here are a few ideas:

1. Understand the Task at Hand
   Delivering an impact across cities with thousands of citizens means breaking down multiple siloes to initiate digital change. Identify priorities and charter cross-departmental and multiagency collaboration.

2. Build a Strong Network
   Deploying hundreds of thousands of IoT sensors takes a multiprotocol IoT network to support them. Engage a trusted vendor who can help you deliver.

3. Focus on Citizens Before Technology
   Many governments want to jump right into technology. It’s an understandable desire. But focusing on citizens and what will benefit them first can help deliver a more effective solution.
Digital transformation is having a massive, transformative effect on every single industry. It’s boosting operational efficiencies, cutting down costs, changing business models, and improving the customer experience in new ways that organizations couldn’t have imagined just a few short years ago.

While it may be true that technology is and will continue to replace human workers when and where it can perform tasks more efficiently, it’s also empowering us. When deployed correctly, digital transformation doesn’t just transform business, it changes our lives by making them more efficient.

This change is being fueled by access to more data and insights that are empowering organizations to make more informed decisions about their businesses. And when data and insight are replicated across entire companies and industries, operations drastically improve.

With this big bang of data occurring across all industries, digitization is becoming so disruptive that it’s changing entire business models seemingly overnight. The introduction of telemedicine and remote monitoring within the healthcare industry, for example, is improving access to doctors, reducing
costs for patients, and easing tensions in some areas affected by physician shortages. Similarly, digital transfor-
mation in retail is putting customers first — and back into stores — by creating a better experience along with more efficient supply chain and inventory management.

The common denominator behind disruption is the improvement in operational efficiency, which leads to long-term financial benefits. But harnessing those benefits means understanding how to optimize data and utilize it in the right way. It takes a big vision and a long-term goal centered on tangible business results, and a tactical focus to act small and move fast — to test new technology in a small, controlled environment that generates results, proves a hypothesis, and lets you iron out kinks before a larger deployment.

Achieving operational efficiency also centers on an organization's ability to understand its unique challenges in the marketplace. At CDW, we have found that even though most organizations believe their challenges are unique, commonalities exist across different industries.

Regardless of industry, learning how to leverage digital transformation and implement it correctly is helping organizations do more with less, work faster and more efficiently, and improve the way they work — as well as the experience they provide.
The manufacturing industry is facing massive changes on the horizon. With a large portion of its workforce set to retire in the next 5–10 years, a current shortage in the workforce, and fewer younger people learning necessary vocational skills, manufacturing companies are looking for new ways to do more with less — something that IoT and digitization can help them accomplish.

Because traditional education isn’t producing the next generation of manufacturers, the industry is turning to technology to help. When hiring new employees, manufacturers are shifting their focus on skill sets — transitioning from hands-on workers to engineers who can help facilitate the newer, robotic capabilities.

Manufacturers are also using IoT to reduce upfront costs by monitoring and optimizing energy use and maximizing both worker productivity and operational efficiency. It’s the ability to connect manufacturing to infrastructure that’s allowing the industry to get data directly off the shop floor to improve operations. This benefit extends to keeping machinery up and running as well as by using sensor data and analytics to inform proactive, and ideally, predictive maintenance procedures. If a manufacturing facility loses a line, it creates real costs — both in downtime loss of revenue as well as repairs.

From helping companies capture and analyze data, to enabling the workforce in new, previously unimaginable ways, IoT is helping the manufacturing industry digitize, modernize, and become more efficient in the process.
Some of the biggest benefits of digital transformation happen in the behind-the-scenes work that transforms business operations. And there is, perhaps, no other industry where the effects are more apparent than healthcare. From improving the patient experience to monitoring the behavior of medical devices, IoT is having a massive impact on healthcare.

Central to healthcare’s ongoing digitization is Real-Time Location Services (RLTS). RLTS is driving efficiency by enabling medical professionals to locate and track assets and people in real time. Tracking patients from the moment they enter the hospital helps providers see how care is being delivered, assets are utilized, and cost-per-patient time is optimized. Within senior care facilities, RLTS is even helping track dementia patients to ensure they don’t wander outside a specified area.

Digital transformation is also creating mobile experiences that are transforming hospitals. Imagine walking into a large facility for the very first time and knowing exactly where to go. Now healthcare organizations are making it possible by equipping hospitals with IoT sensors that give specific instructions. It’s making the patient experience...
easier and eliminating some of the stress patients feel entering the hospital.

Because patient data is so central to healthcare, how do organizations ensure that data remains secure, especially considering that medical records are now more valuable to identity thieves than credit card information? Adding IoT devices onto a network adds potential security vulnerabilities, so healthcare organizations need to continually review and update devices with security top of mind. Solutions like User Entity Behavior Analytics (UEBA) can monitor the behavior of medical devices to detect security abnormalities. For example, if a heart rate monitor that sends information over the network to a specific server suddenly tries sending information to another country, organizations can immediately detect and address it.

From the ground up, the digitization of the healthcare industry isn’t only optimizing efficiencies, it’s also improving the patient experience and helping providers deliver better care. But to make the most out of their digital transformation, healthcare organizations must also focus on how the changes affect both patients and doctors. By addressing human outcomes, they can leverage new technology in ways that help as well as heal.
IoT is giving retailers new ways to improve shopper experiences, increase sales, and reduce operating expenses. Within the industry, tools like wayfinding, portable point-of-sale terminals, and beacons are providing seamless shopping experiences as well as customization that help brick-and-mortar continue to compete with online shopping experiences. Here are just a few ways retail is becoming smarter:

**Speed Counts**

When you’re dealing with thousands of transactions, even seconds add up to make a big difference, especially in a world where shoppers expect immediacy. By evolving legacy point-of-sale systems, introducing mobile technologies, and making sure transaction processing is up-to-date, stores are cutting down on lines as well as actual transaction times.

**Convenience Is King**

Customers are used to downloading apps that act like loyalty cards, giving them discounts on the items they regularly buy. But the big shift we’re seeing today is the marriage of mobile and in-store technologies. Instead of merely distributing discounts, apps now know what you like to buy and how often you buy it. In-store technologies can now point customers toward their favorite items, offer them discounts, or make timely suggestions based on their preference. It’s making the shopping experience much more personalized.
**Bring on the Video**
Today, video analytics and real-time location systems are adding another dimension to retail's digitization by helping stores understand where customers are spending time and what products they're looking for. This data is transforming the way stores adjust their shopping experiences.

For retailers, realizing the benefits of digital transformation is often accomplished in small test-case scenarios. Because few stores are fully equipped to take on a complete transformation, they should consider choosing a single location, technology, or outcome, and implementing the technology necessary to prove your hypothesis. Once it’s successful, that technology can be rolled out in scale or across other locations. By taking small steps, retailers can actually make huge strides in improving the customer experience by using personalized data and convenient mobile technologies that work in harmony.
Key Insights

Over the course of this report, IDG interviewed more than 400 IT leaders about how digital transformation is occurring across a wide range of organizations and industries. From IoT and data demands to the challenges that come with security and implementation, we sought to understand the total impact of digital transformation.

We distilled the research into six key insights. Along with the accompanying report, they help paint a bigger picture of the current technology landscape and shed additional light on the challenges organizations are currently facing and the successes they’re experiencing. For the complete research report, please reference the conclusion of this guide.
KEY INSIGHT 1

DIGITAL TRANSFORMATION IS HAPPENING — AND IT’S HAPPENING NOW
Digital technologies and their accelerating impact on results is driving a world of change that organizations are adopting on a wide scale. From initiating new solutions to piloting and adopting them, the majority of organizations have their digital transformation goals well underway.

86% of organizations have initiated or piloted technology changes to support digital transformations.
KEY INSIGHT 2

THE BIGGEST CHANGES ARE OCCURRING ACROSS THREE AREAS
When it comes to transforming the user experience, organizations are placing an increased focus on security, mobility and data analytics. However, more mature organizations have begun to investigate or adopt AI and machine learning into their operations.

Cybersecurity, mobile solutions and data analytics are the three technologies most widely used in production by organizations.
KEY INSIGHT 3

EFFICIENT OPERATIONS – BETTER RELATIONSHIPS
While improving operational efficiency continues to be the core business driver for digital transformation among most organizations beginning their journey, those organizations who are further along have started using technology to improve customer relationships and information exchange.

**Improving operational efficiency continues to drive the adoption of digital transformation technologies.**

IoT is giving the businesses better visibility into real-time data, leading to faster decision-making.
KEY INSIGHT 4

DIGITAL TRANSFORMATION IS COMMANDING A LARGER SLICE OF THE IT BUDGET
Instead of recycling savings from other areas, organizations are allocating larger budgets toward purchasing digital transformation investments. More mature organizations are placing even more of their new budgets toward digital technology.

17% of IT budgets, on average, are dedicated to digital technology purchases.
KEY INSIGHT 5
SECURITY AND BUDGET ARE THE BIGGEST BARRIERS
Concerns about implementing security to support digital transformation efforts, as well as the budget to purchase new technology, continue to be a challenge for many organizations. Additionally, time-consuming data migration, upgrades to existing infrastructure and legacy system integration are cited as factors slowing their digital transformation progress.

31% of organizations cited security and privacy concerns as one of the main factors slowing their digital transformation progress.
KEY INSIGHT 6

PARTNERSHIPS ARE AN IMPORTANT PART OF THE PROCESS
The level of confidence for digital transformation initiatives is high across nearly every vertical. But despite the high confidence levels, nearly all organizations are turning to technology partners to help them build and integrate solutions across one or more areas.

92% of all organizations will turn to a third party for help in one or more areas of the digital transformation process.
IN CLOSING

Digital transformation is here. The data and insights that it’s providing organizations are changing business models, industries and the customer experience. And while adoption and implementation vary across organizations, one thing is abundantly clear: digital transformation isn’t going anywhere.

Harnessing digital transformation in a way that drives real, tangible business results takes a unified effort, the correct approach, and a willingness to think big, act small, and move fast. The organizations who outline clear business objectives and build a strategy centered on results will ultimately be able to reap the full benefits that come with an effective digital transformation. It takes more than technology. Whether the outcome is operational efficiency or a greater in-store experience, digital transformation takes vision, commitment, and the right partners to drive the change organizations need and want.

Working with a wide range of organizations and partners across different industries to orchestrate and empower digital transformation has given us a unique insight and perspective into designing solutions that work. Now we’re working hard to bring those insights and perspectives together to help organizations navigate the challenges and reap the benefits that come with digital transformation.

For more information, interviews and perspectives, we invite you to visit CDW.com/digitaltransformation
The valuable time, research and perspectives that went into making this report would not have been possible without the help of our partners. From assessment, to design and deployment, they represent the best and brightest minds in technology.

**OUR PARTNERS**
To download a digital version of this report, or learn more about how you can leverage digital transformation to generate powerful results, visit CDW.com/digitaltransformation
<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>The Digital Transformation Insight Report</td>
</tr>
<tr>
<td>25</td>
<td>About the IDG Research Study</td>
</tr>
</tbody>
</table>
Digital transformation is radically reinventing industries. From transportation behemoths to retail chains, organizations are using disruptive technologies to change the way they design business processes, manage operations, oversee employees and engage customers.

Examples of disruptive technology gaining traction include the Internet of Things (IoT) and data analytics/business intelligence. By 2020, Gartner estimates more than half of all new business systems and processes will incorporate IoT in some way. And according to a 2017 Dresner Advisory Services study, 87% of telecommunications companies and 76% of financial services firms rely on Big Data analytics. Behind these emerging technologies, organizations continue to explore solutions and upgrades for network infrastructure, cloud, mobility and security.

Real-world examples of disruptive technology at work are everywhere, from airport hangars to coffee shops. Using 3D printing technology, GE Aviation created an aircraft turboprop engine that consolidates 855 components into just a dozen parts, and dramatically reduces fuel consumption. A robotic barista at startup Café X can serve 120 cups of coffee per hour – without misspelling your name. And today’s modern farmers are relying on drones to get a bird’s-eye view of their crops and identify problems such as drought and insects.

Although use cases vary wildly, the benefits of digital transformation are consistent across many industries, including operational process improvements, cost savings, new sources of revenue and enhanced customer experience.

But adopting technologies to achieve digital transformation requires overcoming a variety of obstacles. Many artificial intelligence (AI) and virtual reality (VR) solutions require serious compute power. An understanding of machine learning (ML) and data visualization is critical to using data analytics tools. And legacy infrastructure or on-premises deployments can prevent the easy integration of mobile and cloud applications.
Key Findings

To solve these and other issues, organizations must identify where they are in their journey, how to take incremental steps to embrace innovative technologies and what defines success for their particular company or industry.

In an effort to understand how organizations are harnessing technology for digital transformation, CDW partnered with IDG in July 2018 to survey 400 respondents in IT-related roles (see box, Page 26, for more information).

Key Research Findings

The IDG study examined the biggest opportunities associated with digital transformation, drivers for investment in transformation, digital technologies in production and on the radar, and inhibitors to progress. Among the more revelatory findings:

- **Organizations are increasingly adopting a digital-first approach to business:** Two-thirds (66%) of organizations have made process, operational and/or technology changes on their own to support digital transformation. However, maturity levels of digital transformation vary across industries. Maturity is based on how long an organization has been using technologies such as mobile, software-defined storage (SDS), Infrastructure as a Service (IaaS), software-defined networks (SDNs), cloud and AI in production, as well as if these technologies have been deployed on an enterprise-wide scale to support digital transformation. For example, the transportation industry is most likely to experience enterprise-wide technology changes.

- **A wide array of technologies, from AI to IoT, are helping to advance digital transformation:** But degrees of implementation differ depending on a solution’s age and popularity. Twenty-seven percent of respondents are actively researching AI; 25% are investigating machine learning; and 23% are looking into IoT. However, data analytics, mobile, cloud and cybersecurity solutions are already in production or far enough along to require some upgrading and revision.

- **Emerging technologies, such as AI, machine learning and IoT are triggering greater IT investment:** Why? Reasons include: better cost control (42%), empowered consumers (40%), exploding volumes of data (38%) and new global security threats (36%). Incentives for investment differ based on industry, however. Forty-three percent of retail respondents are most likely to invest in IoT in response to the demands of an “always-on” economy, whereas 61% of transportation companies cite a rapidly changing competitive landscape for investment in IoT.

- **For all the benefits of disruptive technologies, improving operational efficiencies tops the list:** More than half – 53% – of respondents believe operational efficiencies present the biggest opportunity to leverage digital technologies for an improved customer experience. Increased operational efficiency is also considered a core business driver for IoT and business intelligence (BI) investment among 42% of respondents. In addition, given the heightened concern around cyber threats, 40% cite strengthening security as a key opportunity. Mature organizations are most likely to cite customer relationship improvement (55% of retail/wholesale companies) and information exchange (59% of transportation companies) as priorities.
Organizations typically agree on where to begin their digital transformation journey: Nearly half — 42% — of respondents have focused or will first focus their digital transformation initiatives on operations; 39% will first focus on IT and customer service, and 31% will first focus on sales.

Customer demands are driving organizations’ interest in digital transformation: According to survey findings, 45% of respondents say customer demand for security of personal/sensitive data is top of mind; 45% cite better and more modern functionality; and 35% point to customer demand for personalized experiences and interactions.

Making progress with digital transformation requires overcoming key budget and/or cultural obstacles: According to 31% of survey respondents, the biggest inhibitor slowing or stopping progress with digital transformation is lack of budget and/or resources. Other obstacles include data privacy and security concerns (31%), internal resistance to change (24%), and legacy infrastructure and infrastructure complexity (30%). Transportation companies (59%) are most likely to view legacy infrastructure as an impediment to digital transformation.

Many technology or IT infrastructure barriers prevent organizations from successfully deploying digital technology: Challenges include time-consuming data migration (29%), technology/network upgrades (28%) and change management (25%). Barriers differ across verticals with 41% of transportation companies citing data collection/management analysis, 32% of finance companies pointing to gaps in security, and 35% of state and local governments citing vendor management.

Many organizations choose to focus on process and technology transformation rather than cultural reinvention: Thirty-one percent of respondents are redesigning business processes to leverage digital technologies over the next 12 months, 28% are building a data security/protection strategy, 27% are conducting a technology needs assessment, and 27% are building a data management strategy.

Digital transformation comes at a cost: On average, organizations allot 17% of their annual budget to digital technology purchases. The average spend per vertical is fairly consistent, ranging between 15% and 19% of the IT budget. In terms of how digital transformation investments are funded, 64% of respondents allocate additional budget and 48% reapply cost savings from other areas of the business. The more mature the organization, the more likely it is that new budget will be allocated.

Organizations rely on key metrics to gauge the success of digital transformation: Respondents say they focus on such metrics as improved employee productivity (52%), improved process efficiency through automation (42%), and excellent customer satisfaction evaluations and scores (41%). About one-third of respondents (36%) look to achievement of top-line growth.

This report delves into these key findings to determine the steps organizations must take to transform the digital environment and the benefits they stand to reap from
their digital transformation initiatives, and shows that there’s no single digital transformation journey.

**A Digital-First Approach to Business**

Organizations are increasingly adopting a digital-first approach to business processes, operations and customer engagement. Manufacturers, for instance, are relying on predictive analytics to anticipate equipment failures and production delays. Government agencies are embedding sensors in street lights to better manage traffic flow and improve citizen safety. And telecommunications companies are using VR tools to train technicians in the field.

**Adoption of a “Digital-First” Approach to Business Processes, Operations and Engagement Points**

- **3%** We have not yet started to create a digital transformation strategy
- **11%** We are creating a digital transformation strategy
- **20%** We are currently piloting digital technologies
- **33%** One or more departments or business units have made process, operational and/or technology changes on their own to support digital transformation
- **33%** We have made process, operational and/or technology changes on an enterprisewide scale to support digital transformation

Source: IDG Research in partnership with CDW
But maturity levels of digital transformation vary across industries. Two-thirds (66%) of organizations have made process, operational and/or technology changes on their own to support digital transformation. However, only half of these 66% of respondents have made changes on an enterprisewide scale. One possible explanation: Because these are still early days for technologies such as AI and IoT, organizations are more comfortable deploying them by business unit, or for particular projects.

From an industry perspective, energy, finance and retail/wholesale verticals are the most likely to pilot digital technologies today. It’s easy to understand why. Energy companies are looking for new ways to address the world’s demands on energy supplies and/or increased use of renewables. Financial institutions increasingly depend on data for decision-making in today’s fast-paced marketplace. And evolving consumer expectations are challenging retailers to bring new and innovative products to market faster than ever.

**Transportation Will Experience the Largest Change**

But as disruptive changes sweep through each of these industries, the transportation industry is most likely to experience enterprisewide technology changes. In fact, nearly half — 47% — of transportation companies have made process, operational and/or technology changes on an enterprisewide scale to support digital transformation vs. 33% of retailers, 36% of manufacturers and 23% of government agencies.

One key driver is the impact of the digital marketplace on traditional forms of commerce. For example, services such as Amazon Prime are making two-day delivery the norm. Amazon is also redefining distribution models by encouraging people to start their own small businesses, delivering Amazon Prime packages in Amazon-branded vans and uniforms.

As a result, shipping rivals such as UPS, FedEx, the U.S. Post Office and DHL are facing mounting pressure to meet rising consumer service expectations while also increasing efficiencies and cutting costs. For many, the answer is to readily embrace disruptive technologies in new and innovative ways. UPS trucks, for example, have more than 200 sensors to collect data points on vehicle operations. This data is fed into a UPS analytics system, which analyzes overnight whether new truck parts are needed. By proactively predicting equipment failures, the IoT-enabled system helps prevent delays, improve productivity and better serve customers.

Other applications of digital technology in the transportation industry include cloud-based analytics and embedded sensors that can monitor truck location, freight temperature and even the well-being of drivers.

Although obstacles — and competitors — differ across verticals, all organizations face considerable challenges that require digital reinvention.

**The Technology Maturity Curve**

Organizations are relying on a wide array of technologies to advance digital transformation. But degrees of implementation differ depending on the age and understanding of the technology. For instance, only about one-quarter of respondents are actively researching AI, machine learning and IoT.

The explanation is somewhat obvious: AI, machine learning and IoT are still relatively new and untested capabilities. As a result, many IT workers lack the necessary expertise to deploy and maintain solutions.
that include these technologies. In fact, survey findings indicate that the farther along an organization is on the digital transformation maturity curve, the more comfortable they are with using or deploying disruptive technologies.

Another barrier to enterprisewide implementation of disruptive technologies: cultural resistance. Some employees fear losing their jobs to AI, machine learning and IoT. After all, automated application-tracking software is already taking over tasks for human resources managers, while bots can easily displace employee help desk support agents. Forward-looking organizations, however, realize that broad generalizations like this aren’t necessarily accurate: automation can cut costs, improve processes and free up knowledge workers for higher-priority or more innovative thinking.

At the other end of the spectrum, more proven technologies, such as data analytics,

### Most Critical Technologies Organization Is Evaluating or Using

<table>
<thead>
<tr>
<th>Technology</th>
<th>On my radar or actively researching</th>
<th>Piloting new initiatives</th>
<th>In production in a business unit or division</th>
<th>In production enterprisewide</th>
<th>Upgrading/refining</th>
<th>Not interested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artificial intelligence</td>
<td>27%</td>
<td>19%</td>
<td>19%</td>
<td>12%</td>
<td>7%</td>
<td>17%</td>
</tr>
<tr>
<td>Machine learning</td>
<td>25%</td>
<td>18%</td>
<td>13%</td>
<td>17%</td>
<td>6%</td>
<td>20%</td>
</tr>
<tr>
<td>Internet of Things (IoT)</td>
<td>23%</td>
<td>19%</td>
<td>22%</td>
<td>15%</td>
<td>10%</td>
<td>12%</td>
</tr>
<tr>
<td>Software-defined networking (SDN)</td>
<td>22%</td>
<td>14%</td>
<td>17%</td>
<td>24%</td>
<td>9%</td>
<td>15%</td>
</tr>
<tr>
<td>Bots</td>
<td>20%</td>
<td>18%</td>
<td>16%</td>
<td>12%</td>
<td>8%</td>
<td>26%</td>
</tr>
<tr>
<td>Software-defined storage (SDS)</td>
<td>20%</td>
<td>17%</td>
<td>22%</td>
<td>18%</td>
<td>7%</td>
<td>15%</td>
</tr>
<tr>
<td>Infrastructure as a Service (IaaS)</td>
<td>19%</td>
<td>16%</td>
<td>23%</td>
<td>19%</td>
<td>10%</td>
<td>12%</td>
</tr>
<tr>
<td>Microservices/containers</td>
<td>19%</td>
<td>14%</td>
<td>20%</td>
<td>14%</td>
<td>9%</td>
<td>24%</td>
</tr>
<tr>
<td>Augmented reality (AR)/Virtual reality (VR)</td>
<td>18%</td>
<td>18%</td>
<td>18%</td>
<td>10%</td>
<td>8%</td>
<td>28%</td>
</tr>
<tr>
<td>APIs/embeddable</td>
<td>18%</td>
<td>19%</td>
<td>17%</td>
<td>16%</td>
<td>10%</td>
<td>21%</td>
</tr>
<tr>
<td>Platform as a Service (PaaS)</td>
<td>17%</td>
<td>18%</td>
<td>22%</td>
<td>21%</td>
<td>5%</td>
<td>16%</td>
</tr>
<tr>
<td>Data analytics</td>
<td>15%</td>
<td>19%</td>
<td>20%</td>
<td>26%</td>
<td>16%</td>
<td>4%</td>
</tr>
<tr>
<td>Mobile solutions</td>
<td>14%</td>
<td>17%</td>
<td>23%</td>
<td>24%</td>
<td>15%</td>
<td>6%</td>
</tr>
<tr>
<td>Cybersecurity</td>
<td>13%</td>
<td>16%</td>
<td>18%</td>
<td>26%</td>
<td>21%</td>
<td>5%</td>
</tr>
</tbody>
</table>

*Source: IDG Research in partnership with CDW*
mobile, cloud and cybersecurity, are already in production and/or in need of upgrading and revision. Case in point: More than one quarter — 26% — of respondents have data analytics in production enterprise-wide; 16% are looking to upgrade. Twenty-four percent of respondents have a mobile solution in production enterprise-wide, and 15% need to upgrade. And 26% of respondents have cybersecurity solutions in place, as 21% look to upgrade.

The top technologies already in production among respondents who have made enterprise-wide digital changes include:

- Mobile (52%)
- Software-defined storage (SDS) (51%)
- Infrastructure as a Service (IaaS) (50%)
- Software-defined networking (SDN) (49%)
- Artificial intelligence (AI) (45%)

That’s because these technologies are now a business imperative. Organizations that may have shied away from deploying mobile technology because of the complex integration requirements with legacy processes and systems have seen the light. And with Gartner reporting that today’s employees use an average of three different devices throughout the day, organizations can no longer ignore the productivity gains of mobile applications.

Cloud-based platforms and storage solutions, such as SDS, IaaS and SDN, have become go-to technologies as organizations look for cost-effective ways to store data, scale quickly and achieve greater agility.

**Getting Smart About Business**

Technologies, such as IoT and BI and/or analytics technology, are triggering greater IT investment. Reasons include the need for better cost control (42%), empowered consumers (40%), data explosion (38%) and new global security threats (36%).

Incentives for investment differ based on vertical. For example, 43% of respondents in the retail sector are most likely to invest

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**Events or Business Situations Triggering Organization’s Investment in IoT, BI, and/or Analytics**

<table>
<thead>
<tr>
<th>Event Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapidly changing competitive landscape (e.g., demand for greater agility and speed to market)</td>
<td>48%</td>
</tr>
<tr>
<td>Need for better cost control</td>
<td>42%</td>
</tr>
<tr>
<td>Empowered consumers/users (e.g., demand for seamless user experiences across all touchpoints; demand for real-time access to data)</td>
<td>40%</td>
</tr>
<tr>
<td>Data explosion (e.g., volume and types — structured, unstructured)</td>
<td>38%</td>
</tr>
<tr>
<td>New global threats (e.g., cybercrime, growing need for data protection and privacy)</td>
<td>36%</td>
</tr>
<tr>
<td>Changing regulatory/compliance environment (e.g., GDPR)</td>
<td>35%</td>
</tr>
<tr>
<td>Always-on economy (e.g., same-day delivery; 24/7 availability to the customer)</td>
<td>29%</td>
</tr>
</tbody>
</table>

*Source: IDG Research in partnership with CDW*
in IoT and BI in response to the demands of an “always-on” economy. These days, consumers expect instant access to information on everything from product availability to return policies. By equipping warehouses with sensors, retailers can determine the exact location of a product and discover how many are on the shelf. The result is more accurate inventory, faster fulfillment of orders — and happier customers.

Sixty-one percent of transportation companies cite a rapidly changing competitive landscape as reason for investing in IoT and BI. As competitors roll out services such as next-day delivery, transportation companies need to better anticipate customer needs and service preferences. Business intelligence tools can help by providing data to optimize routes, identify logistical issues and improve supply chain transparency.

Operational Efficiencies Are Only the Beginning
For all the benefits of disruptive technologies, improving operational efficiencies is a top priority for many organizations, and a key driver of IT investment. There’s good reason: More than half — 53% — of respondents believe operational efficiencies present the biggest opportunity to leverage digital technologies for improving customer experience. Increased operational efficiency is also considered a core business driver for IoT and BI investment among 42% of respondents.

But opportunities for improving customer relations extend beyond the way companies operate. Forty-one percent of respondents say enhancing overall customer experience/relationship presents the biggest opportunity to harness transformation technologies to improve customer experience. For example,

### Biggest Opportunities to Harness Digital Transformation to Improve Customer/Patient/Constituent Experiences

<table>
<thead>
<tr>
<th>Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving operating efficiency</td>
<td>53%</td>
</tr>
<tr>
<td>Enhancing overall customer experience/relationship</td>
<td>41%</td>
</tr>
<tr>
<td>Strengthening security</td>
<td>40%</td>
</tr>
<tr>
<td>Enhancing existing product/service offerings</td>
<td>38%</td>
</tr>
<tr>
<td>Real-time and transparent exchange of information</td>
<td>37%</td>
</tr>
<tr>
<td>Anticipate/predict customer or end-user behavior and trends</td>
<td>36%</td>
</tr>
<tr>
<td>Enabling better internal/external collaboration and innovation (with customers, suppliers, etc.)</td>
<td>36%</td>
</tr>
<tr>
<td>Creating new lines of business and products/services</td>
<td>26%</td>
</tr>
<tr>
<td>Improving internal team productivity and morale (improving service)</td>
<td>26%</td>
</tr>
</tbody>
</table>

Source: IDG Research in partnership with CDW
many retailers are equipping their sales associates with tablet devices. When a customer asks for an item, the associate can open a mobile CRM app, check in-store inventory in real time and provide an immediate and accurate response rather than go to the back of the store, leaving the customer alone.

Another 40% cite strengthening security drives investment — and for good reason. Cyberattacks, phishing attempts, network eavesdropping, malware and many other threats not only jeopardize the confidentiality, integrity and availability of IT resources, but the trust and confidence of customers.

In fact, according to the Breach Level Index, 1.9 billion data records worldwide were compromised during the first half of 2017 due to 918 data breaches, taking a significant toll on customer loyalty.

**Variance Among Verticals**
The drivers for harnessing digital transformation vary among verticals. A staggering 73% of state/local government respondents cite improving operational efficiencies as the biggest opportunity to improve customer experience. It’s easy to understand why: Many government agencies are bogged down by bureaucracy and/or outdated legacy technology systems. By improving
how they roll out new initiatives and working to eliminate waste, public agencies can respond faster to constituent requests and offer better services.

On the other hand, 52% of manufacturers cite enhancing internal team productivity and morale as key to improving customer experience. One possible reason: Manufacturing is becoming increasingly automated as robots take over select mundane and repetitive tasks. Harnessing the benefits of disruptive technologies such as robotics, automation and IoT requires assuring employees that they'll benefit from these changes.

In the case of today’s retail and wholesale verticals, 55% of respondents cite enhancing overall customer experience as the biggest opportunity for leveraging disruptive technologies. That's no surprise given the pressure retailers are under to leverage data such as buyer behavior patterns to better engage customers and offer personalized services.

And 59% of transportation companies view real-time and transparent exchange of information as critical to improving customer experience using digital technologies. After all, a holistic view of the supply chain, along with real-time truck location and delivery data, can help transportation companies better compete in today’s on-demand economy.

Despite these variances among verticals, the farther along an organization is in its digital transformation, the more likely it is to cite customer relationship improvement and information exchange as prime opportunities. Certainly, operational efficiencies can help organizations harness the benefits of disruptive technologies, such as AI, BI and IoT. But this is only a first step in the digital transformation journey.

The Rising Role of the Customer

The good news is organizations tend to agree on where to begin their digital transformation journey. Nearly half – 42% – of respondents have focused or will first focus their digital transformation initiatives on operations; 39% will first focus on IT and customer service, and 31% will first focus on sales.

Of these three, customer demands are likely to have the most impact on organizations’ decisions regarding digital transformation. These days, customers are using their smartphones to price-check products on the spot, scour online reviews to form their opinions and crowdsource everything from product design to shipment delivery. Showrooming, webrooming (online browsing before buying in-store), personalization — they’re all modern-day phenomena enabling customers to raise their voices and influence an organization’s digital transformation.

So what customer demands are driving organizations’ interest in digital transformation? According to survey findings, 45% of respondents say customer demand for security of personal/sensitive data is top of mind. Equifax, eBay, JP Morgan Chase, Yahoo, Target Stores – they’re among the biggest data breaches of the 21st century. Root causes range from human error to vulnerable point-of-sale payment card readers. But the results are the same: a higher risk of fraud and identity theft for customers, and legal liabilities, loss of revenue and compromised consumer confidence for organizations.
First Areas of Focus for Digital Transformation Initiatives

- Operations: 42%
- IT: 39%
- Customer service: 39%
- Sales: 31%
- Finance: 27%
- Marketing: 25%
- HR: 15%
- Website/eCommerce: 13%
- Supply chain: 13%
- Engineering: 13%
- R&D: 5%

Source: IDG Research in partnership with CDW

Customer/End-User Demands Driving Interest in Digital Transformation

- Ensure security of personal or sensitive data: 45%
- Offer better/more modern functionality: 45%
- Offer personalized experiences and interactions: 35%
- Provide reliable service and 24/7 availability: 34%
- Increase the speed of time to market: 30%
- Enable use/support of cloud-based solutions: 29%

Source: IDG Research in partnership with CDW
From Convenience to Customized Interactions
Another key factor driving interest in digital transformation: customer demand for better and more modern functionality, according to 45% of respondents. Regardless of vertical, customer expectations are the same — access to modern tools and technologies that will ensure a seamless, omnichannel experience, anywhere, anytime.

Examples are everywhere. Today's banking customers want to deposit a check or schedule an appointment from a mobile or desktop application. Coffee drinkers expect to check and reload their loyalty card balances through their smartphone, a retailer's website or within a brick-and-mortar location — with changes made in real time. More and more healthcare providers are creating online portals so patients can instantly access everything from lab results and research reports to treatment options. And innovations in warehousing and data-driven supply chains are putting increasing pressure on transportation companies to improve delivery methods.

Customer demand for personalized experiences and interactions is also driving interest in digital transformation, according to 35% of respondents. Forget about email blasts and mass marketing campaigns. Today's organizations must go beyond broad-based targeting to create tailored experiences based on a customer's buying history and behavior patterns across all touchpoints. This requires leveraging large volumes of consumer data to precisely target individuals with tailored content and services. The result is increased conversion rates and greater customer loyalty.

Fortunately, some industries have already caught on to the power of the consumer. For instance, 53% of transportation companies will first focus digital transformation initiatives on customer service — efforts that could include offering customers next-day delivery and package-tracking capabilities. And 65% believe customer demands for reliable service and 24/7 availability are driving greater interest in digital transformation.

Similarly, 53% of retail and wholesale companies will first focus digital transformation initiatives on sales — a prime opportunity to take advantage of data-driven sales automation tools and CRM systems. And 65% of these companies report that consumer demand for personalized experiences and interactions is driving an interest in digital transformation.

Managing Change — and Overcoming Challenges
For all the competitive advantages of digital transformation, changing the way an organization designs business processes, manages operations, oversees employees and engages customers isn't easy.

According to 31% of survey respondents, the biggest inhibitor of digital transformation progress is a lack of budget and/or resources. Part of the problem is that the digital requirements of business departments put pressure on IT to do more with the same resources — or doing more with less. And it's not uncommon for the C-suite to shift dollars spent on IT activities like help desk to supporting new initiatives such as IoT, which can help gain market share.
Data privacy and security concerns rank equally high among respondents (31%) as a key obstacle to success with digital transformation initiatives. AI, machine learning and IoT require vast volumes of data to produce actionable insights. IoT, in particular, creates new endpoints — and new vulnerabilities. And the complexity of machine learning — which uses algorithms to help computers learn — can make it difficult for organizations to be transparent about the processing of personal data.

Consider, for example, the General Data Protection Regulation (GDPR). This European Union law on data privacy and protection requires companies that handle the data of EU citizens to comply with some of the strictest data privacy regulations in the world, or face significant financial penalties. For instance, when collecting personal data, companies have to specify what it will be used for, and not use it for anything else — a burdensome requirement. Data security is also a concern as hackers become increasingly sophisticated and brazen in their attempts to steal consumer data and compromise IT systems.
Moving Past Legacy Systems
Another challenge to digital transformation: 30% of respondents report that legacy infrastructure and infrastructure complexity are slowing or stopping progress with digital transformation. Many of today’s older, transaction-based legacy systems still serve mission-critical business processes and store critical data. To reduce costs and ease migration, some organizations are building wrappers around these age-old systems using APIs. Others are eliminating or replacing them entirely—a slow and costly endeavor that can hinder digital transformation. A significantly smaller segment (21%) point to siloed operations as a hindrance to digital transformation.

From a vertical perspective, transportation companies (59%) are most likely to view legacy infrastructure as an impediment to digital transformation. One possible explanation is that the transportation industry is decades-old and has always relied on robust and sprawling systems to maintain operations. And many of its systems are siloed and rely on proprietary operating systems.

Nearly a quarter—24%—of survey respondents cite internal resistance to change as impeding digital transformation progress. That’s easy to understand: Customer service chatbots and self-driving cars threaten to replace hard-working employees. In fact, a McKinsey Global Institute study reveals that by 2030, as many as 800 million jobs could be lost worldwide to automation. In the U.S. alone, between 39 and 73 million jobs could be automated—a third of the total workforce. At the same time, many of these digital technologies promise to deliver plenty of business benefits.

Getting a Handle on Deployment
Deploying new digital technologies also brings a variety of challenges. The majority of respondents—29%—cite time-consuming data migration tasks as the biggest barrier to implementation. That’s because moving data requires data preparation, such as cleaning data to ensure pristine quality and eliminating duplicate records. And when organizations are talking about unstructured data, which represents the large majority of new data being generated around the world, that task becomes extremely difficult, time-consuming and expensive.

Twenty-eight percent of respondents consider technology/network upgrades to be a barrier to the deployment of digital technologies. For example, many IoT systems require connecting remote sensors with other IoT components, including edge computing, data centers and the cloud. The result is an interconnected platform with multiple moving parts—each of which requires network readiness and modernization to support digital transformation.

The same percentage (28%) of respondents say integrating legacy systems with new applications is a challenge to deployment. And 25% consider change management a barrier, for good reason: AI, IoT and other disruptive technologies often necessitate skills upgrades and organizational restructuring.

Again, barriers differ among verticals with 41% of transportation companies citing data collection/management analysis as a challenge. The obvious explanation for this: the industry’s legacy systems create hard-to-integrate data silos. Thirty-two percent of finance companies view filling
gaps in security as a challenge. Case in point: IoT systems can provide hackers with a direct path to connected devices and operational technology systems. Firewalls, encryption and network segmentation can help mitigate these risks by isolating IoT devices. And 35% of state and local governments identify vendor management as a significant barrier as these agencies tend to engage in a wide array of public and private partnerships, resulting in multiple requests for proposal and other important documents.

A Culture of Constant Change

Overcoming these obstacles is critical to achieving digital transformation. Yet many organizations choose to focus on process and technology transformation before taking steps to change company culture.

For instance, 31% of respondents are redesigning business processes to leverage digital technologies over the next 12 months, 28% are building a data security/protection strategy, 27% are conducting a technology needs assessment and 27% are building a data management strategy.
These are important first steps as business processes must adapt and evolve to accommodate AI, IoT and BI applications. But organizations must also reinvent corporate culture to support enterprise-wide digital transformation.

Forget about rigid business processes and system silos. Rather, a growing faction of survey respondents are encouraging a startup/OK-to-fail culture where employees can experiment in one-off projects — without negative repercussions. Benefits range from building more resilient teams to getting products and services to market faster. C-level executives can help fuel this shift by talking openly about their own career missteps and encouraging employees to share lessons learned in corporate newsletters and via employee portals.

Changing organizational structure can also support a culture of digital transformation. This includes empowering employees to make their own decisions; relaxing rigid reporting lines; driving greater accountability of project successes — and failures; flattening hierarchical structures that...
impede agility; and driving greater collaboration among disparate teams. For example, 19% of respondents are deploying core IT team members into business units for a better balance of technology skills and business acumen. And 35% report that new roles will be created in IT and/or lines of business to enhance customer experience.

**Funding Digital Transformation**

From redesigning business processes to encouraging a startup culture, more than half — 55% — of respondents have taken or plan to take three or more of these steps to transform their digital environment. But digital transformation comes at a cost. For this reason, on average, 17% of an organization’s annual budget is allocated toward digital technology purchases. And the average spend per vertical is fairly consistent (between 15% and 19% of the IT budget).

In terms of how digital transformation investments are funded, 64% of respondents allocate additional budget spend and 48% reapply cost savings from other areas of the business. The more mature the organization, the more likely it is that new budget will be allocated — an indication that these companies are willing to place bigger bets on more innovative solutions.

---

**Percent of Annual IT Budget Allocated to Digital Transformation Technologies**

<table>
<thead>
<tr>
<th>Percent of IT Budget Allocated</th>
<th>1%</th>
<th>7%</th>
<th>19%</th>
<th>25%</th>
<th>22%</th>
<th>9%</th>
<th>5%</th>
<th>3%</th>
<th>8%</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>1%</td>
<td>7%</td>
<td>19%</td>
<td>25%</td>
<td>22%</td>
<td>9%</td>
<td>5%</td>
<td>3%</td>
<td>8%</td>
</tr>
<tr>
<td>Less than 5%</td>
<td>7%</td>
<td>19%</td>
<td>25%</td>
<td>22%</td>
<td>9%</td>
<td>5%</td>
<td>3%</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>5% – 9%</td>
<td>19%</td>
<td>25%</td>
<td>22%</td>
<td>9%</td>
<td>5%</td>
<td>3%</td>
<td>8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10% – 19%</td>
<td>25%</td>
<td>22%</td>
<td>9%</td>
<td>5%</td>
<td>3%</td>
<td>8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20% – 29%</td>
<td>22%</td>
<td>9%</td>
<td>5%</td>
<td>3%</td>
<td>8%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30% – 39%</td>
<td>9%</td>
<td>5%</td>
<td>3%</td>
<td>8%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40% – 49%</td>
<td>5%</td>
<td>3%</td>
<td>8%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50% or more</td>
<td>3%</td>
<td>8%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don’t know</td>
<td>8%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Average: 17% of the IT budget**

**How Digital Transformation Investments Are Funded**

- Additional budget spend: 64%
- Re-apply cost savings from other areas of the business: 48%
- Not funding digital transformation: 4%
- Don’t know: 4%

*Source: IDG Research in partnership with CDW*
Measuring Success by Maturity
Given the considerable impact of digital transformation on culture, organizational structure and the way employees work, organizations must carefully measure the success of their digital transformation investments. Values metrics range from productivity and efficiency gains to customer experience. However, benefits fluctuate based on an organization’s maturity.

More than half — 52% — of respondents rely on improved employee productivity to measure the success or impact of their digital transformation investments in disruptive technologies. Consider, for example, Kimberly-Clark. The multinational personal care corporation created an intelligent restroom platform that uses tiny sensors, placed on public restroom equipment, such as soap dispensers and toilets, to collect and analyze data in real time. By using a powerful combination of IoT devices, network connectivity and computer algorithms, the system can not only alert maintenance managers via an iPhone app of a restroom mess, but it lets users better prioritize staff resources and more accurately stock carts for improved employee productivity.

Another valued metric for gauging the success of digital transformation: improved process efficiency through automation (42%). At Creating Revolutions, a collaborative robot named “Manuel Noriega” assembles the tiny components of a customer service paging device. Unlike other employees of the startup, Manuel works for hours, day in and day out, without bathroom breaks or healthcare benefits. The result: Creating Revolutions has reduced its product rejection rate to nearly zero, increased production rates and reduced its overhead by double digits. Better yet, manufacturing processes can be tweaked in real time for greater flexibility.

Valued Metrics to Demonstrate the Success of Digital Transformation Investments

<table>
<thead>
<tr>
<th>Metric</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved employee productivity</td>
<td>52%</td>
</tr>
<tr>
<td>Improved process efficiency through automation</td>
<td>42%</td>
</tr>
<tr>
<td>Excellent customer experience as measured by customer satisfaction evaluations/scores</td>
<td>41%</td>
</tr>
<tr>
<td>Achievement of top-line growth</td>
<td>36%</td>
</tr>
<tr>
<td>Improved employee retention rates and team morale</td>
<td>33%</td>
</tr>
<tr>
<td>Accelerated time to market</td>
<td>25%</td>
</tr>
<tr>
<td>Reduced customer churn rate</td>
<td>22%</td>
</tr>
<tr>
<td>Improved risk posture</td>
<td>18%</td>
</tr>
</tbody>
</table>

Source: IDG Research in partnership with CDW
Forty-one percent of survey respondents cite excellent customer satisfaction evaluations and scores as a measure of digital transformation success. This metric is especially important to 57% of respondents in the retail sector as these companies tend to rely heavily on customer loyalty and positive word of mouth for profitability. And a smaller percentage of respondents look to achievement of top-line growth as an indicator of success (36%).

Together, these metrics add up to a strong business case for digital transformation. Most interesting is that more digitally mature organizations are significantly more likely to experience cost-savings benefits and improved IT/business collaboration from their transformation initiatives.

Interestingly, both mature and less-mature companies are experiencing the same degree of operational efficiencies via digital transformation: 32% of both segments. That’s a strong indication that achieving operational efficiencies is the first step in any digital transformation journey. Overall, 55% of respondents have experienced three or more business benefits from their transformation initiatives.

### Digital Transformation by Level of Maturity

<table>
<thead>
<tr>
<th>Mature companies</th>
<th>Less-mature companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric: Improved productivity</td>
<td>40%</td>
</tr>
<tr>
<td>Metric: Reduced infrastructure costs</td>
<td>37%</td>
</tr>
<tr>
<td>Metric: Better visibility into real-time data to make decisions faster</td>
<td>35%</td>
</tr>
<tr>
<td>Metric: Enabling next-generation technology (e.g., AI and machine learning)</td>
<td>19%</td>
</tr>
</tbody>
</table>

Source: IDG Research in partnership with CDW
**Third Party As a Partner**
Clearly, organizations believe they have the right people, technology and processes in place to leverage new technologies, such as IoT, network infrastructure, data analytics, cloud and mobility. To note, 55% of all respondents report they are extremely or very confident in their preparedness to support a digital transformation strategy – a figure that is similar across verticals. Confidence is particularly high among senior-level executives: 63% vs. 48% of other titles – a strong indication that organizations will continue to invest heavily in digital transformation.

**Confidence in Preparedness to Support Digital Transformation Strategy**

- 13% Extremely confident
- 42% Very confident
- 38% Somewhat confident
- 6% Not very confident
- 1% Not at all confident

**Confidence by Title**

<table>
<thead>
<tr>
<th>Title Type</th>
<th>Extremely Confident</th>
<th>Very Confident</th>
<th>Somewhat Confident</th>
<th>Not Very Confident</th>
<th>Not at all Confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP + Titles</td>
<td>20%</td>
<td>43%</td>
<td>34%</td>
<td>7%</td>
<td>2%</td>
</tr>
<tr>
<td>Other Titles</td>
<td>7%</td>
<td>41%</td>
<td>41%</td>
<td>8%</td>
<td>2%</td>
</tr>
</tbody>
</table>

*Source: IDG Research in partnership with CDW*
Despite high confidence levels, though, nearly all organizations (92%) will turn to a third party for help in one or more areas, including:

- Time-consuming data migration tasks (27%)
- Technology/network upgrades (27%)
- Data collection/management/analysis (23%)
- Integrating legacy systems with new applications (22%)

These factors align closely with the challenges cited earlier in the survey results. The average respondent’s company will seek third-party help in three or more of these areas. And while 43% of energy organizations will turn to a third party for change management, 35% of transportation companies will look to a third party for help optimizing processes to enable quicker cycles, such as agile approaches.

### Challenges for Which Companies Will Turn to a Third-Party Partner for Help

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time-consuming data migration tasks</td>
<td>27%</td>
</tr>
<tr>
<td>Technology/network upgrades</td>
<td>27%</td>
</tr>
<tr>
<td>Data collection/management/analysis</td>
<td>23%</td>
</tr>
<tr>
<td>Integrating legacy systems with new applications</td>
<td>22%</td>
</tr>
<tr>
<td>Application development/re-platform needs</td>
<td>20%</td>
</tr>
<tr>
<td>Developing a long-term transformation strategy</td>
<td>20%</td>
</tr>
<tr>
<td>Change management</td>
<td>19%</td>
</tr>
<tr>
<td>Mapping application dependencies</td>
<td>18%</td>
</tr>
<tr>
<td>Vendor management</td>
<td>17%</td>
</tr>
<tr>
<td>API development and deployment</td>
<td>17%</td>
</tr>
<tr>
<td>Filling gaps in security/protecting assets that are running across virtual boundaries</td>
<td>16%</td>
</tr>
<tr>
<td>Lack of complete visibility into infrastructure health</td>
<td>13%</td>
</tr>
<tr>
<td>Optimizing processes to enable quicker cycles, i.e., agile approaches</td>
<td>13%</td>
</tr>
<tr>
<td>Inability to act on data (e.g., make business process changes)</td>
<td>12%</td>
</tr>
</tbody>
</table>

*Source: IDG Research in partnership with CDW*
The good news? Third-party partners can meet organizations wherever they are on the maturity curve. Consider a retail chain fully deploying a mobile solution so its sales associates can better serve customers, or a healthcare company researching the benefits of AI capabilities that can help simulate molecules for early drug development.

Regardless of vertical industry or level of maturity, the right third-party provider can help organizations realize operating efficiencies to achieve greater cost benefits, improve cross-organization collaboration and better engage customers.

**Biggest Deployment Barriers vs. Challenges Requiring a Third Party**

- **Barriers**
- **Challenges**

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Barriers</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time-consuming data migration</td>
<td>29%</td>
<td>27%</td>
</tr>
<tr>
<td>Technology/network upgrades</td>
<td>28%</td>
<td>27%</td>
</tr>
<tr>
<td>Change management</td>
<td>25%</td>
<td>19%</td>
</tr>
<tr>
<td>Integrating legacy systems with new applications</td>
<td>28%</td>
<td>22%</td>
</tr>
<tr>
<td>Data collection/management/analysis</td>
<td>20%</td>
<td>23%</td>
</tr>
</tbody>
</table>

*Source: IDG Research in partnership with CDW*
The Bottom Line: How the Right Technologies — and Partner — Can Lead to Digital Transformation Success

Less than 10% of respondents across all industries have yet to establish a digital transformation strategy. Clearly, organizations recognize the business benefits of deploying disruptive technologies, regardless of obstacles such as change management and data migration. The key is for organizations to take the time to identify where they are on the digital transformation maturity curve, evaluate what they want to derive from revising business processes and find the right partner to advance them along their journey.
To qualify for the July 2018 IDG Research/CDW survey, *The Digital Transformation Insight Report*, respondents had to be familiar with and involved in digital transformation at their organizations.

Qualified respondents work in an IT-related function at the Manager level or above or a non-IT role at the Director level or above, at a company with 250 or more employees.

The average company size was 5,590 employees.
**Respondent Profile – Job Title and Purchasing Responsibilities**

### Job Title

<table>
<thead>
<tr>
<th>IT-Related (Net)</th>
<th>50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIO</td>
<td>5%</td>
</tr>
<tr>
<td>CTO</td>
<td>4%</td>
</tr>
<tr>
<td>CSO/CISO</td>
<td>1%</td>
</tr>
<tr>
<td>Chief Architect</td>
<td>1%</td>
</tr>
<tr>
<td>Executive VP/Senior VP/VP</td>
<td>9%</td>
</tr>
<tr>
<td>Executive Director/Managing Director</td>
<td>5%</td>
</tr>
<tr>
<td>Director</td>
<td>16%</td>
</tr>
<tr>
<td>Manager</td>
<td>10%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Non IT-Related (Net)</th>
<th>50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO/COO/Chairman/President</td>
<td>13%</td>
</tr>
<tr>
<td>CFO/Treasurer/Controller</td>
<td>8%</td>
</tr>
<tr>
<td>Executive VP/Senior VP/VP/General Manager</td>
<td>13%</td>
</tr>
<tr>
<td>Director</td>
<td>16%</td>
</tr>
</tbody>
</table>

### Involvement in Digital Transformation

- Identifying the need for a strategy: 51%
- Determining requirements for acting on strategy: 52%
- Evaluating products/services for purchase: 52%
- Recommending or specifying types of products/services/vendors for purchase: 46%
- Authorizing purchases/approving expenditures: 45%
- Leveraging digital technologies in my department or organization: 41%
### Respondent Profile – Industry

#### Represented Industries

<table>
<thead>
<tr>
<th>Industry</th>
<th>Response Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>12.5%</td>
</tr>
<tr>
<td>Financial services (banking, insurance, brokerage)</td>
<td>12.5%</td>
</tr>
<tr>
<td>Healthcare (providers and hospitals, senior care)</td>
<td>12.5%</td>
</tr>
<tr>
<td>Manufacturing (including automotive, aerospace and defense, construction, engineering, chemical, metals and mining)</td>
<td>12.5%</td>
</tr>
<tr>
<td>Retail, wholesale and distribution</td>
<td>12.5%</td>
</tr>
<tr>
<td>Government: state and local</td>
<td>12.5%</td>
</tr>
<tr>
<td>Energy (utilities, oil and gas)</td>
<td>12.5%</td>
</tr>
<tr>
<td>Transportation (airlines, trucking, railroads, shipping, logistics)</td>
<td>12.5%</td>
</tr>
</tbody>
</table>
### Respondent Profile – Company Size

<table>
<thead>
<tr>
<th>Company Size</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>15,000 employees or more</td>
<td>21%</td>
</tr>
<tr>
<td>10,000 – 14,999</td>
<td>5%</td>
</tr>
<tr>
<td>5,000 – 9,999</td>
<td>8%</td>
</tr>
<tr>
<td>2,500 – 4,999</td>
<td>18%</td>
</tr>
<tr>
<td>1,000 – 2,499</td>
<td>21%</td>
</tr>
<tr>
<td>500 – 999</td>
<td>14%</td>
</tr>
<tr>
<td>250 – 499</td>
<td>13%</td>
</tr>
<tr>
<td>Fewer than 250</td>
<td>–</td>
</tr>
</tbody>
</table>
To download a digital version of this report, or learn more about how you can leverage digital transformation to generate powerful results, visit CDW.com/digitaltransformation