IT, disrupt thyself: Automating at scale

AUTOMATE INFRASTRUCTURE

Manage your infrastructure via code, not keyboard.

AUTOMATE SYSTEM AND SOFTWARE MANAGEMENT

Manage your systems, tools, and software via code, not keyboard.

OPTIMIZE YOUR AUTOMATION

Implement machine learning for key areas. (Identify likely outages.)

TREND 4

IT, disrupt thyself: Automating at scale

Future-forward IT organizations are modernizing the "IT back office" to a proactive model of self-service and engineered automation

There is still an enormous amount of repeatable work done by people in many established organizations. Think of administration, monitoring, reviews, and responding to tickets among other tasks. Over the last decade, cloud vendors have demonstrated how automating processes that remove repetitive work can help increase overall efficiency. Automated processes are consistent and auditable, which can help reduce errors and improve quality. It can also free skilled tech talent to focus on higher value-added tasks.

IT leaders, for various reasons, have been slow to pursue these opportunities. This,

however, is beginning to change. In what we recognize as an emerging trend, some CIOs are disrupting their organizations and the army of technologists that currently execute many manual tasks and handoffs across systems, architecture, development, and deployment.

Beyond leveraging investments made by cloud providers to accelerate their journeys, CIOs are following the cloud providers' playbook to identify and standardize processes. They are attacking opportunities in infrastructure, software components, security, and applications. Once their enhancements mature,

CIOs and their teams optimize the new service delivery and automation using advanced techniques such as AI and ML.

Early participants in this trend have already seen gains in efficiency and lower labor costs. In a recent survey of IT and engineering leaders, 74% of respondents said that automation has helped their workforce work more efficiently. Fifty-nine percent reported cost reductions of up to 30% on teams that have embraced process automation.[1] Add to this noticeable increases in quality and security, and it becomes clear why 95% of respondents are prioritizing process automation, with 21% saying it's a high priority.[2]

The pace of change only continues to increase. The business is asking for more, and they want it more quickly than ever before. The talent market is white hot, with growing demand for advanced skill sets (that are in perpetually short supply.) Everyone is trying to do more with less.

The time to (finally) disrupt IT is now.
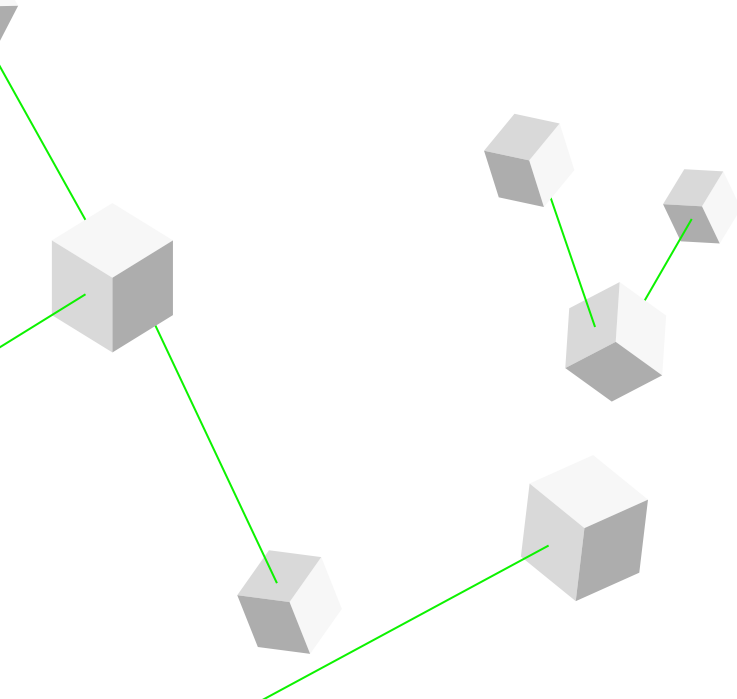
Disruptive journeys

The journey from manual to automated activities isn't new. Indeed, in previous *Tech Trends* reports, we have examined this transition in areas such as cybersecurity, advanced networking, and the dynamic provisioning of hardware and software. So, what is different this year? Simply put, competition. The pandemic is upending the labor market. Perhaps more importantly, it's in digital natives' DNA to push automation to its limits. Hence, startups can achieve greater scalability, reliability, resilience, and efficiency at lower costs than their established counterparts. They hold an additional advantage in that they aren't held back by technical debt or organizational compromises that require handoffs and manual interventions. For digital natives, such old-school actions become a last resort rather than the norm. This approach is fundamentally different from those often taken by established

organizations. Today's competitive marketplace requires a more robust IT posture, which can translate into a competitive advantage.

Organizations looking for opportunities to disrupt their status quo can focus their efforts in three areas:

Standardize and automate on-premises infrastructure

The first leg of an automation journey involves enabling all infrastructure and management functions to be controlled by code. Programmatic control of resources makes it possible to apply policies consistently and to store previously manual configurations in automated code and configuration files. These solutions require deploying some mix of compute (containers, virtualized servers, and functions), networking (software-defined), and storage.

For automation to scale, processes must be executed consistently across the enterprise. However, if you look at the operational landscapes of many organizations today, you will find a mixed bag of processes, applications, and workarounds. When processes work in one fashion on server A and another on server B; when environments do not have parity; or when networks behave differently, then operations become more costly and inefficient.

If this sounds familiar, consider creating a standard, common approach to developing, deploying, and maintaining your solutions and components. Cloud vendors realized early on that the more you can programmatically control resources, the easier it becomes to treat environments as a program to be managed. Many of today's infrastructure-as-code platforms trace their roots to early cloud-based automation initiatives.

As organizations explored infrastructure-as-code, they recognized they could also deploy security-as-code or operations-as-code, controlling them all with configuration or code files. The goal of "as-code" is to push toward an environment in which everything—even bespoke systems—aligns on a set of optimized rules. With rules in place, a single engineer can control a large pool of resources that would have taken several administrators to manage. This frees infrastructure teams to work like the cloud providers: automating, taking advantage of opportunities for self-service, and getting out of the way.[3]

As organizations streamline operations and management with automation, they should also revisit their initiation processes. Historically, creating new infrastructure involved elaborate procurement exercises with escalating approval levels. In today's world, adding another virtual instance may not warrant any level of prior approvals. Identifying and automating (or

eliminating) similar handoffs and approvals that made sense in a legacy environment can help streamline operations, augment developer productivity, and provide much sought-after organizational agility.

When approached methodically and strategically, automation can deliver significant economies of scale. It offers other benefits as well:

- **Greater accuracy.** Individuals will no longer be subjectively interpreting documents, queries, and forms.

- **Increased security and resilience.** Rules will be applied more consistently. It's worth noting that a nascent "security-as-code" trend is gaining momentum.

- **Improved reliability.** Problems fixed in the code typically won't reoccur.

We offer a word of warning for those using the providers' "as code" services. Make sure you have organized your processes and operations to get the most out of those capabilities. If you don't, you may reproduce existing limitations in a modern environment.

Standardize and automate software, management tools, and applications

Leading-edge IT organizations no longer manage infrastructure; they now develop code that manages infrastructure, an approach that can boost scalability, efficiency, and consistency. This same approach can apply to software components, management tools, and a variety of applications. Modern IT organizations manage software code that, in turn, manages aspects of development, maintenance, operations, and security. Ultimately, it is easier to manage a single piece of code than an array of manually configured

solutions. For example, infrastructure-as-code enables us to bring the agility of software development to infrastructure management. From a deployment perspective, it is possible to manage full-stack solutions rather than separate components that several teams must coordinate.

Like infrastructure, a few on-premises software components are prime candidates for automating. For example, database management, integration tools, security, systems management, and O/S patching can be easily virtualized and abstracted.

For organizations using cloud infrastructure, vendors offer an expanding menu of platform-as-a-service (PaaS) options that feature enhanced automation, programming interfaces, integrated middleware, and management capabilities. Maturing PaaS offerings may also provide enhanced developer self-service, programming interfaces, and more tightly integrated middleware and management capabilities.

How can you decide where to start? First, identify the "user journeys" of those trying to deliver functionality to end users, and the points of friction these users encounter. Ruthlessly prune unnecessary approvals and handoffs and then automate or create self-service options for the steps that stand between developed code and production deployments. Finally, once your automation journey is underway, old performance metrics may no longer apply. It's important at this point to incentivize an "automation culture" by defining metrics for the organization you want to become.

Optimize automation with ML and rules

Typically, a first pass at automation is rules-based. For example, "if process x doesn't respond, restart the process." Over time, IT staff members can identify issues that cause outages and malfunctions and optimize automation tools to address them,

just as cloud providers demonstrated a decade ago. Eventually, you can move beyond rules-based to machine learning–based automation. An automation journey that begins immaturely can subsequently grow in terms of sophistication.

Many types of ML—predictive, capacity modeling, action response, outage recovery, among others—support different IT activities. Yet for most organizations, identifying outages early and harnessing predictive modeling to prevent future outages is a top ML priority. By focusing on these areas, ML-enabled teams can measurably improve uptime and decrease outage severity. Moreover, a growing number of PaaS offerings feature embedded ML capabilities. For example, PaaS offerings often use ML to maintain and optimize routine operations that were previously managed manually by developers, administrators, and engineers. The net effect is that development and operations can run in higher gears.

Another optimization technique involves applying rules consistently. Consider this: Enterprise architecture is a set of decisions around what you can use and how. The resulting rules represent an optimum approach to architecture design and function. As part of your automation journey, consider prioritizing consistency. Do this by methodically embedding these rules into systems and processes across the enterprise. Consistency delivers optimum performance.

The way forward

For CIOs and other leaders who are exploring automation opportunities, time is of the essence. In today's rapid-fire innovation climate, there is not a lot of business value to be found in paying humans to maintain servers and data centers. As CIOs disrupt their IT organizations with automation, there will be ripe opportunities to shift employees' focus

from patching, monitoring, and measuring to higher-value engineering activities. More broadly, automation's possibilities extend to areas such as development, deployment, maintenance, and security, thus making it possible to gain efficiency and consistency across more of IT's operations.

The journey from managing things to managing code that manages things won't happen overnight. For example, there may be some cultural resistance from tech workers and the C-suite, or legacy systems may have manually configured components that make automation difficult. Finally, change is hard, even for the nimblest IT teams. People accustomed to handoffs and human-to-human interaction may adapt slowly to self-service and automated provisioning. For organizations just getting started, it may be helpful to create a dedicated team that develops and deploys automation and self-service to standard processes. This team can methodically broaden its approach,

transforming more processes over time as
they climb the stack.

Luckily, some needed automation is readily
available in the form of cloud-based solutions.
The rest is achievable through engineering and
a deliberate, consistent focus on building an
automated future.
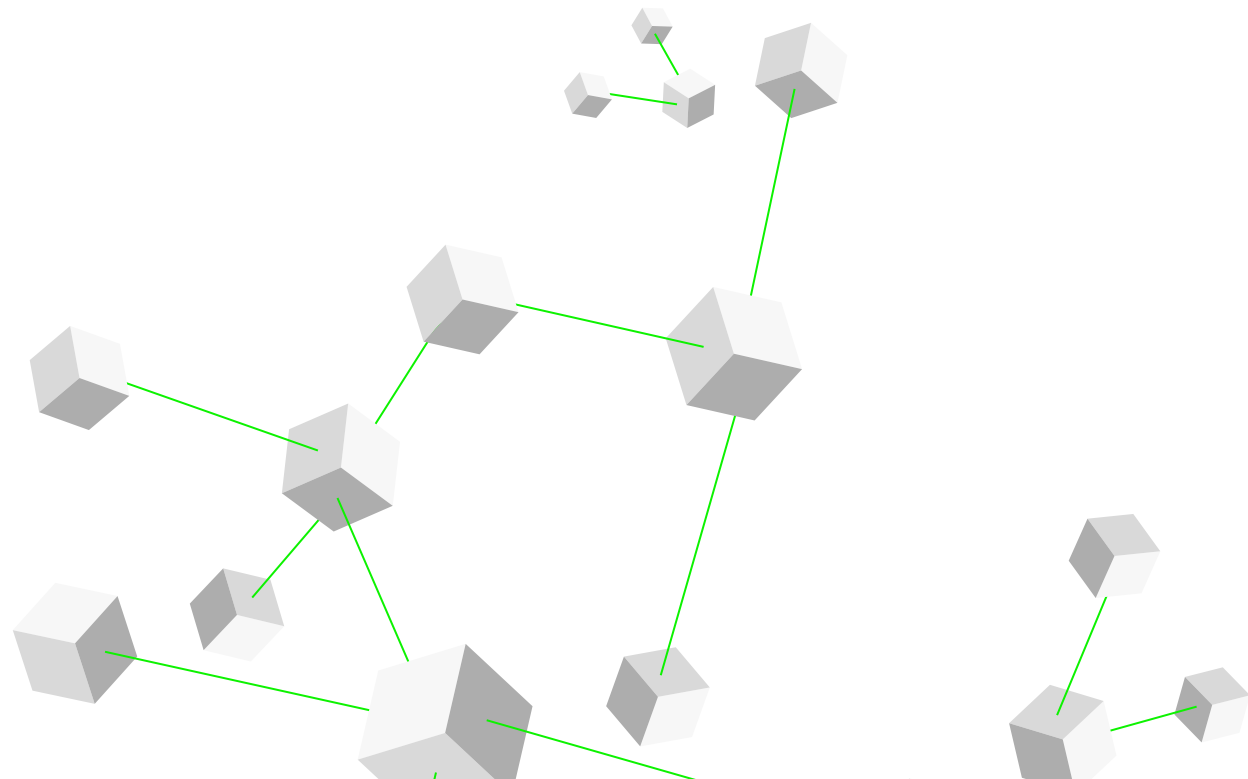
LESSONS FROM THE FRONT LINES

Automating in the cloud unleashes developer agility and speed of innovation

Back in 2015, Capital One stated all new applications would be built and run in the cloud and all existing applications would be migrated to the cloud. This may have seemed like an ambitious goal at the time given the scale of the enterprise's on-premises infrastructure and the fact that it's rare for any business to operate entirely in the cloud. But the financial services firm hit its target, becoming the first US bank to report that it has exited legacy data centers and gone all-in on the public cloud.[4] This has delivered several benefits, but among the most important is the increased opportunity for automation and the rapid scaling that comes with it.

As Capital One was moving more data and applications to the cloud, the technology team members knew they didn't want to simply replicate their existing systems and processes. They wanted to take advantage of the cloud's full range of possibilities

for building a more modern technology stack. This included adopting leading trends like microservices, automation, real-time data, and machine learning.

"Compute and storage are just the tip of the iceberg with cloud," says Chris Nims, senior vice president for cloud and productivity engineering in the technology division at Capital One.[5] "If you just forklift your applications to the cloud, you don't get the full range of benefits."

Capital One now increasingly leverages a serverless computing model to make sure developers don't have to worry about finding compute resources, combined with containers to deliver applications, and necessary libraries and other dependencies. The team also built a rules engine that it open-sourced that helps organizations define policies to better manage their cloud environments with automated governance, security, compliance, and efficiency.

All these moving parts may look complicated, but the team found it has led to better uptime. Part of utilizing the modern tech stack means it's able to deploy automated monitoring tools. Machine learning applications monitor real-time

server data and system applications to ensure they're running smoothly and alert technicians to problems before most users notice them.

"The parts have gotten smaller, and we knew the old way of manually doing monitoring wasn't going to scale," says Arjun Dugal, CTO of the financial services division at Capital One.[6] "We've had to reinvent how we monitor our applications ecosystem by leaning on advanced cloud-native monitoring tools and leveraging machine learning–based anomaly detection. Our strategy has paid off—incidents have actually gone down even as the number of potential points of failure has dramatically increased."

Automating infrastructure has made Capital One a more attractive player in the battle for tech talent. Nims says most people who go to school for computer engineering do so because they like the challenge of solving hard problems. When they graduate, they don't want to spend their time seeking approvals, monitoring server performance,

or maintaining outdated databases. Automating these things lets engineers spend their time on more impactful projects, which gives Capital One a leg up in hiring. "Great engineers want to work on modern infrastructure," Nims says. "They want to be at the forefront of technology. So much of this goes back to allowing our engineers to spend their time on the most important things."

Improving the job satisfaction of developers isn't just about attracting talent. It's also about business value. Dugal says Capital One employs 11,000 technologists, 85% of whom are developers, so even marginal increases in their agility scales to major benefits for the company.

"This is about getting the mechanics out of the way so they can focus on the highest value things," he says. "Greater developer agility translates directly to a big boost in customer benefits and speed of innovation."

UiPath paves the way to IT automation success

UiPath, a leading provider of robotic process automation (RPA) platforms since 2005, has been enabling customer automation journeys by starting with an ambitious strategic vision for what automation can deliver. It then creates an operating model that ensures automation continuously improves and brings value to customers.[7] According to Jay Snyder, senior vice president of customer strategy and solutions at UiPath: "Automation is empowered and governed by IT but enabled by the business. That's where the chocolate and peanut butter all comes together."

Having helped hundreds of organizations automate business processes, UiPath is increasingly turning its expertise toward the business of IT. According to Eddie O'Brien,

senior vice president of operations and partners, more involvement from senior leaders in IT can help an organization scale its automation efforts within IT departments: "Often, people put their feet in the water with automation, but don't know where to go next. Closer engagement with IT can bring about more digital transformation."

When used properly in IT, says Snyder, teams not only control the automation platform but can also turn it inward to automate IT processes such as ticket creation, license management, or cybersecurity response. Even beyond individual processes, the vision is to enable zero-touch IT by automating high-impact IT services such as DevOps and data management. Snyder's team works with IT departments to create playbooks of automation use cases, prioritizing the highest-volume, lowest-value tasks. Team members also create IT personas, such as a system admin persona, to teach their

RPA platform how to accomplish a set of tasks across various business processes or departments, just as an IT employee would. In doing so, an organization's IT staff can focus on performing higher-value tasks or designing further automations. "People often focus on reducing staff through automation, but we've seen that the true benefit is in multiplying productivity," says Snyder.

The result is a cycle of automation that continues growing in IT departments. As more employees are empowered by digital assistants, team members generate more automation ideas, and robots are further incorporated into IT processes. In addition, the AI/ML in the platform analyzes an organization's automations and can recommend improvements or expansions. According to O'Brien, the key to achieving ongoing IT automation is to start with the right strategy in place. The goal is to create end-to-end automation that drives

digital and business transformation. Says O'Brien, "When we bring our vision of the fully automated enterprise to fruition, we can have a major impact on the efficiency of IT and how it's managed today."

Automation helps Anthem stay ahead of insurance industry turbulence

Anthem, Inc., provides health insurance to about 40 million people across the United States, and connecting these members to care is its top priority. That's why in recent years the company has reoriented its IT department to serve its member-focused mission by automating large segments of its core infrastructure, allowing engineers to spend time on projects that are closer to business priorities.

"The industry has moved from managing things to building things," says Srinivas Yamujala, staff vice president of the cloud center of excellence at Anthem.[8] "In order for Anthem to stay competitive, we had to be more digital and nimble. In support of our transformation initiatives, our focus has been on end-to-end automation to simplify and expedite delivery of infrastructure services and shared platforms so that we can build and release applications and products more quickly."

One of the areas of focus as part of this journey has been to enable cloud. Anthem was relying on traditional infrastructure delivery based on manual, cumbersome processes to acquire and provision infrastructure, Yamujala says. If onboarding a new customer called for increased server capacity, it could take three to six months to acquire and fully configure the hardware. But now, Anthem has most of its business processes in the cloud, and

this formerly months-long process takes as little as two hours. It has developed a patent pending orchestration and provisioning automation platform that is secure and compliant with health care domain regulatory and security policies. This, in turn, has enabled the application development teams to provision resources on demand in minutes.

To support innovation and transformation initiatives, Anthem took its cloud vendor services and hardened them with Anthem's rigorous security protocols. These preconfigured services are assembled into a service catalog, providing application developers with the capability to use several native cloud vendor services that already meet legal and security compliance standards. In the past, each development team wanting to use a particular service would have to build guardrails for these services themselves, resulting in disparate approaches and redundant implementations.

In addition, while working on applications, developers previously had to submit tickets with security teams to open specific firewall ports so that their applications could communicate with other systems and applications. Now, Anthem has baked all that into its automated platform using microservices and APIs. The need for developers to manage cumbersome firewall changes has been minimized, and Anthem is working toward eliminating it altogether using zero-trust capabilities. This has improved its developer community productivity tremendously, which is anticipated to get even better in the future.

"We want to empower our developer community," says Yamujala. "Most of our automation efforts are about simplifying application development and deployment. A lot of automation you see today is about infrastructure as code, but we're going beyond that to

think about what enables developers to address business needs more quickly."

An additional benefit of automating all of this is that it's helped improve system uptime. Maintaining on-premises infrastructure forces engineers to monitor servers and the applications they host. With all the interdependencies between applications and hardware configurations, engineers had a hard time staying ahead of issues, Yamujala says. Now that complexity is handled by cloud services, and system performance has improved.

The move to automate core infrastructure and platforms, as well as aspects of application development and deployment, has had benefits far beyond IT. Yamujala says the broader business is now in a better position to respond quickly to evolving business needs and customer expectations.

"Our ability to respond to changing industry needs, to customer needs, and to sustain business in changing conditions has become even more nimble, agile, and fast," Yamujala says.

OUR TAKE
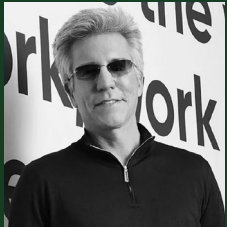
Bill McDermott
President and CEO of ServiceNow

C.J. Desai
Chief operating officer
at ServiceNow

At ServiceNow, we think of our platform as the control tower for digital transformation across the enterprise.

In today's digital world, IT architecture *is* business architecture, and developing a coherent approach to automation across your technology infrastructure has never been more important.

We know this because at ServiceNow, we are "client zero." Everything we put out into the world we use internally first. This helps us see the impact of automation and understand the benefits of coordinating our digital activities. It has also helped us understand how automation needs to work in a modern IT organization, one that supports the digital transformation vision of the entire enterprise.

When our platform started out, we supported prescriptive workflows, and our initial use case was IT service management. Over time, clients began using the platform for other use cases, such as cybersecurity operations, HR onboarding and offboarding, and customer service,

to name a few. And our platform has grown to support machine learning–enabled automation and will soon offer RPA capabilities for systems that lack clean interfaces.

Yet automating discrete front-end processes is not the ultimate objective in any digital transformation effort. The real goal is to clean up the messy middle and back-end systems and integrate islands of automation on the front end. Over the years, businesses have spent billions of dollars making sure their digital front ends and customer experiences shine. Yet many have invested much less in the back-end systems and supporting technologies, which remain replete with manual processes. This slows operations down and minimizes the benefit of great front-end customer experiences.

Customers won't accept this—they want what they want, when they want it. They expect visibility. You may have a

great ordering system, but if customers can't track the status of their orders, the overall customer experience is lacking.

This is why we advocate moving away from the older system of record models to a more modern "system of action" approach. You need to connect with your customers throughout the entire sales process, not just on the front end. Manual efforts don't scale. Automation does.

Automation isn't just about meeting customer expectations. It's also important for improving the employee experience. Few workers want to do the same rote tasks every day. This is especially true for developers and engineers, who would rather spend their time solving high-value, complex problems than doing basic system monitoring. At the same time, businesses across industries are struggling to find the talent they need. The talent war is real, and most enterprises are

having a hard time keeping up. Automating low-value tasks frees your employees to work on higher-value problems, which is one of the best ways to improve the talent experience and boost retention.

Ultimately, this is all about increasing speed to value. Whether the goal is connecting with your customers or empowering employees to work on higher-value tasks, a coordinated approach to automation helps your business realize gains much more quickly. Once you've automated your operations, the time to value ranges from weeks to months, rather than months to years.

EXECUTIVE PERSPECTIVES

STRATEGY

Automation technology applied to IT promises benefits to efficiency, resilience, and scalability. CEOs should work closely with IT leaders to understand the plans to meet operational and strategic goals. Because the move enables IT staff to focus on more value-added work, leaders can work with CIOs and other tech leaders to refocus and retrain the IT workforce. They can create excitement around personal growth and learning, instead of apprehension around changes to IT, and open new possibilities for technology's role in the organization.

FINANCE

With tech talent in historically high demand, CFOs should welcome the accelerating shift toward automation. Beginning the journey by automating mundane IT activities requires upfront investment of both talent and funding. As IT talent is freed from routine work, increasingly sophisticated automation can be applied with increased resilience and at lower cost. Upskilling and retooling will be required, but the shift to automation opens more options to source diverse IT talent.

RISK

As companies increasingly automate IT, bad actors may look for additional attack vectors. In legacy environments, administrators were trained to bring systems back online after outages and incidents. Without proper planning, automated environments can present challenges. CROs should emphasize resilience when IT processes are being digitized and automated. As organizations automate, they can build in their risk management principles at the outset, using AI to respond more proactively to emergent threats.

ARE YOU READY?
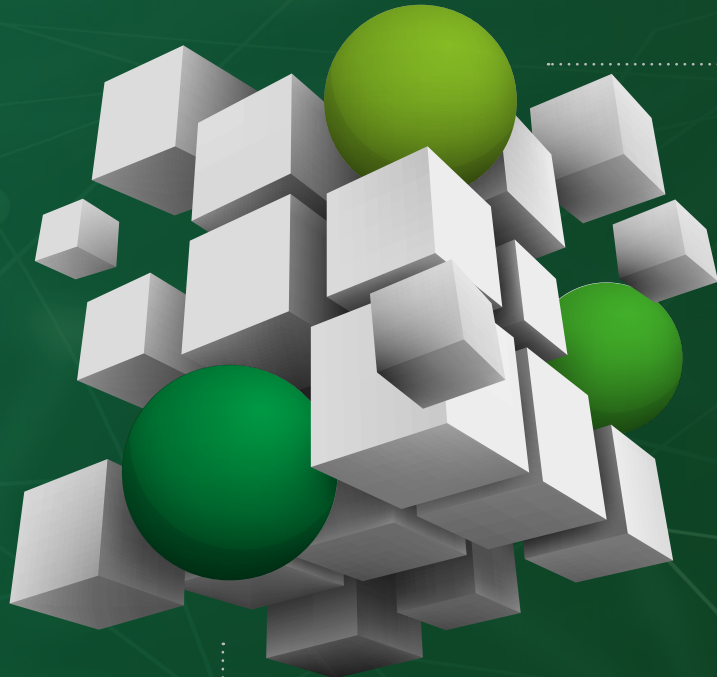
KEY QUESTIONS

1 Which of your infrastructure and management functions currently require manual intervention? Of these, which can you standardize and automate?

2 What is the lowest value activity performed by each of your employees? Can it be automated or eliminated?

3 Which of your automated functions are candidates for optimization? How are you moving beyond rules-based decision-making to explore ML optimizations?

LEARN MORE

NoOps in a serverless world
Read on to see how the hyperautomation of cloud computing has created a NoOps environment to help drive business outcomes.

Enterprise IT: Thriving in disruptive times with cloud and as-a-service
Read the 2021 edition of the Everything-as-a-Service (XaaS) Study and see how adopters are benefiting from the XaaS model.

Digital transformation collection
Explore latest insights driving efficiencies, powering new products and services, and enabling new business models.

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Our insights can help you take advantage of emerging trends. If you're looking for fresh ideas to address your challenges, let's talk.

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