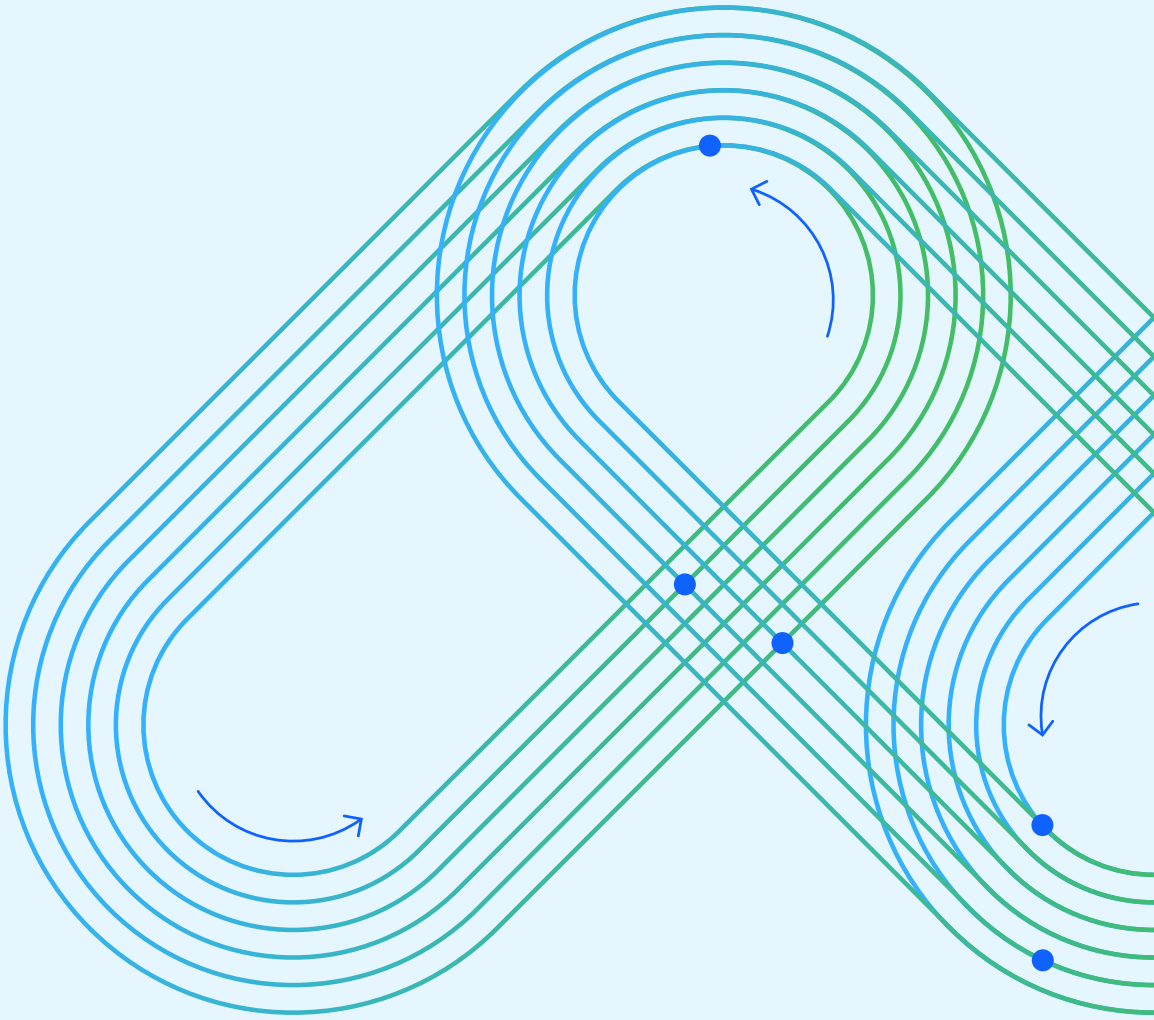
IBM **Consulting**

How to help IT manage itself with autonomous operations

Using AI and automation to proactively adapt to business disruptions



Executive summary

Keeping pace with rapid change in IT operations and your hybrid cloud estate isn't easy. As CTOs, CIOs and senior engineers have found, implementing a transformation strategy for IT operations offers opportunities for high reliability, rapid transformation and significant cost reduction.

In a 2020 IBV research report, 80% of surveyed companies expected profitability growth with automation.[1]

However, implementing digital transformations effectively often brings challenges. Only 7% of organizations are using AI and automation at scale to maximize benefits.[1]

Autonomous operations is a strategy focused on allowing IT to manage itself, providing a proactive approach to addressing issues, rather than reactive. In implementing it, you're simplifying control of your IT operations to allow the environment to become the backbone that drives both business and IT resiliency.

It's critical to place new emphasis on end-to-end observability across all aspects of your operations and incorporate autonomous solutions to monitor the increased volume of alerts, trouble tickets and telemetry data. Incorporating AI and automation into your IT operations adds new capabilities to act upon the operational data you're acquiring and determine which areas of concern deserve the highest priority to avoid revenue-limiting downtime. And with the addition of an IT control tower, you'll have single-pane visibility into the entire operation, along with the power to easily drill down into any aspect of your entire hybrid cloud estate.

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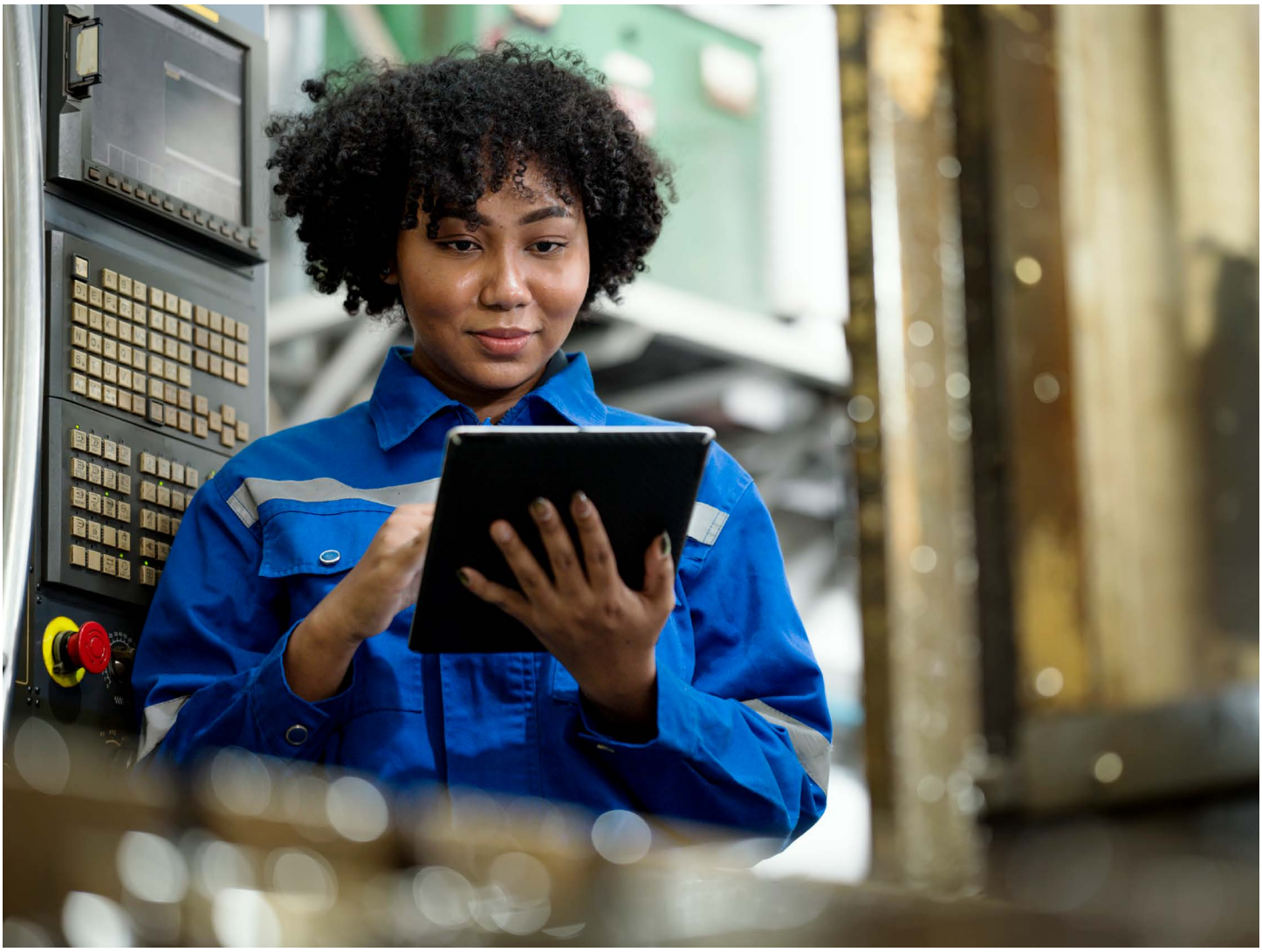


01 The power of autonomous IT operations

Research shows that 60%–90% of outage incidents are caused by changes in an organization's IT environment.[3]

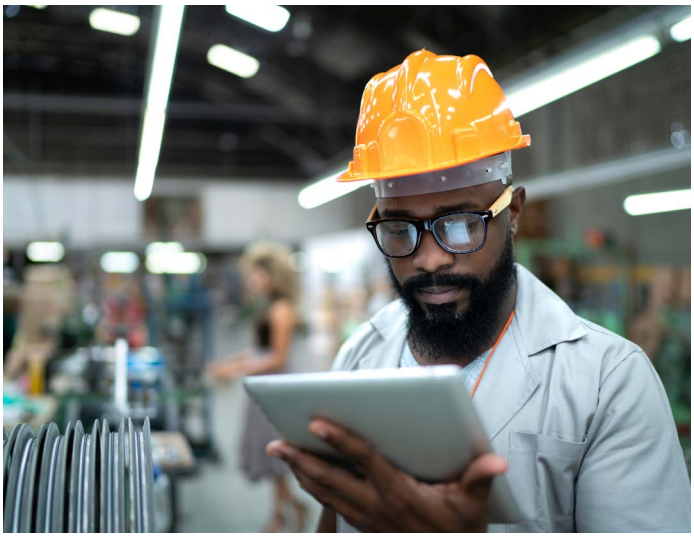
Today's hybrid cloud estate is expansive and extremely complex. 39% of organizations have 500 or more applications in the portfolios today.[2]

The accelerating pace of the market, technology innovations and evolving customer needs necessitate a new era of IT transformation. For many businesses, this work includes:

- Moving more workloads to the cloud
- Adding cloud platforms to your public cloud estate
- Building new applications or integrating existing ones with the cloud
- Securing skilled resources for private cloud data
- Managing increasingly complex SaaS platforms
- Incorporating advanced devices at the edge

However, embarking on this work can open your organization up to unwanted risk. Your expanding hybrid cloud estate creates an exponential surge of incoming operations data, often flooding IT departments with telemetry and signals that are extremely difficult for teams to process manually. This surge of incoming data could make your organization vulnerable to unexpected downtime and security threats.

To help remedy this situation, it's important to begin digitizing hybrid cloud operations management to act autonomously across your entire IT estate. Imagine predicting your IT operations problems before they cause downtime or using AI to prioritize the anomalies that could most impact your business, then automating responses that take action to resolve those problems quickly and efficiently, based on your company's standard operating procedures.



You can start by establishing an autonomous operations roadmap, then modernizing existing applications, data, processes, tools and employee skills. This process allows them to operate cohesively across the IT estate, helping to achieve target business goals faster and more efficiently.

Take the next step by incorporating AI and automation into your modernized hybrid cloud estate to accelerate issue resolution and root cause analysis. By deploying automation and AI at scale across IT operations, you can tame the complexity of hybrid cloud applications, platforms and tools.

An autonomous IT management system must be able to *identify* a single problem among a multitude of mission-critical data streams, *understand* it well enough to devise a course for the next best action and *act* with automated responses that resolve the issue.

For example, work at a global manufacturer's warehouse came to a halt after a network device glitch in its data center impacted everything from order processing to shipping and delivery. Because its IT estate included applications, infrastructure and networks that were siloed without overarching observability, it took additional time—and money—to diagnose the issue.

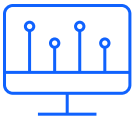
If the company had autonomized its IT operations management, the system could have identified the network device issue by processing the incoming alerts simultaneously. Then the system could understand that the network device only needed to be rebooted so it could act to remedy the situation. Such an automated process resolves issues faster, saving money and resources, and ultimately elevating customer satisfaction.

Research shows that 44% of digitally driven enterprises expect AI and machine learning to have a transformational impact on their business in the next 3-5 years.[4]

In this white paper, we'll explore how autonomous digital operations use these key concepts to deliver improved insight, faster responses and proactive preventive measures to effectively and efficiently manage your hybrid cloud estate.

02 Identify: Monitor every IT event in real time

Obtaining system-wide, real-time metrics like mean time to identify (MTTI) is the impetus of autonomous IT operations.



Improving observability is essential to autonomous IT operations, allowing you to stay informed about what's happening across your entire hybrid cloud estate.

This insight is essential to avoiding outages and protecting business operations, as the average cost of one hour of downtime has risen by 30% since 2016 alone.[5]

In the past, system engineers often focused on monitoring physical assets like disk storage fragmentation, memory capacity and file structures. But those measurements didn't provide much actionable data and they don't reflect the necessary KPIs you need to optimize operations. What has emerged are "golden signals" like system latency, network traffic metrics, and alerts and errors that provide better real-time, active IT information.

These golden signals provide the inputs required to monitor IT systems that are hosting continuously delivered cloud-based and on-premises applications. To implement these activity metrics, IT operations must "shift left" from simply reacting to problems to anticipating possible problems that can affect performance.

It's important to detect anomalies earlier and proactively look for abnormal operations patterns. As a result, operations are moving on from highly reactive and legacy KPIs like mean time to respond (MTTR) to more modern and predictive KPIs, such as mean time to detect (MTTD), mean time to identify (MTTI) and mean time to know (MTTK) the resolution.

Improving observability helps you track IT operations end to end, making it easier to identify and locate critical events as they happen across your applications, data and processes. And, with a better picture of your operations, you can perform root cause analysis faster with more confidence to prevent the problem from causing disruptions again.

Companies with better IT estate visibility can expect to reduce incidents by 60%.[6]

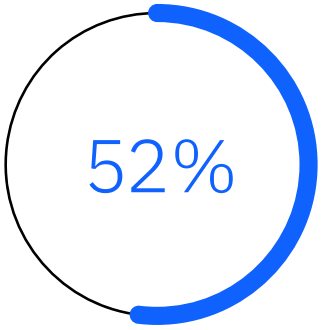
One of the most important concepts within observability is the integration and coordination of operational data. While there's no shortage of data points, unless these sources are all aware of each other, problems can still exist. For example, if a server is connected to 10 workstations and the server goes down, the event would generate 11 alerts—all for the same problem.

To make matters worse, if different teams or providers are involved in those 11 systems, each one assumes the event is specific to them and they're the ones who need to resolve it. Such duplication of effort wastes time and resources. In a digital operations model, the IT system sensory input sources are integrated and linked so that AI will be able to filter, correlate, group and understand those signals. In this example, the system would have continuously learning rules to consolidate those 11 alerts into one trouble ticket that could quickly be addressed by the appropriate entity.

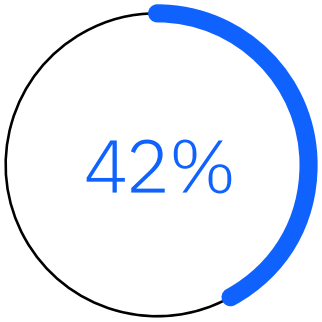
To achieve the maximum benefits of advanced observability, it's imperative to infuse AI and other technologies used to analyze data from the IT alerts flooding in. Infusing AI not only enhances IT operations, but can also be used to improve DevOps, site reliability engineering (SRE), security and service management. The goal of AI infusion is to both curate and enhance the quality of operational data as it continuously learns and improves associations between events and responses.

03 Understand: Use AI to filter, correlate and initiate IT actions

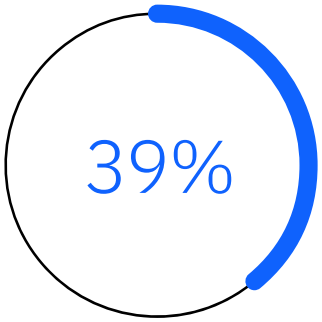
According to research from S&P Global Market Intelligence,[7] there are three main drivers for the adoption of AIOps within IT:



Improved security



Optimized resources



Enhanced outcomes

Retrieving and collecting all the telemetry in your IT estate is needed to effectively streamline digital operations. But the volume and velocity of data coming in can easily overwhelm your staff. Manual filtering isn't practical. It requires IT teams to devote too much energy reacting to problems—leaving little time for proactive investigations.

To effectively manage this large volume of incoming operational data, businesses turn to AI infusion, or specifically AIOps, which combines advanced analytics, AI and machine learning to understand what events mean. This understanding is from both an IT lens and the impact to business to gauge how best to respond. AIOps can also help preserve institutional knowledge that typically gets lost in IT personnel transitions.

AI doesn't handle alerts and tickets the way humans typically do—on a first in, first out (FIFO) basis, which is highly reactive rather than proactive. Instead, because of its ability to access and correlate such a vast variety of incoming data, AI uses a more intelligent, business-correlated response to prioritize the issues with the biggest impact on your company and resolve those issues first.

In one example, a global logistics and shipping company found that digital IT operations offered a much more efficient way to run its infrastructure. After improving digital operations visibility, along with implementing AIOps and automation, it experienced a 97% reduction in telemetry "noise," which reduced the volume of alert tickets by 60%.[6] This reduction afforded the IT staff more time to attend to incidents that could seriously disrupt the business.

The process of deduplicating and filtering alerts delivered a 40%–50% increase in execution efficiency for IT teams. And they estimated a savings of 360 hours of manual effort per month on infrastructure maintenance tasks.[6] These real-world efficiencies are the kinds that digital operations can deliver for hybrid cloud management.

Another challenge today's businesses face is the loss of institutional knowledge due to employee turnover. As employees transition or IT service providers change, new staff may lack the knowledge to solve issues that were once handled routinely and easily. What about runbooks? Even if the documentation exists, often newcomers may find it cumbersome at best, or worse, outdated or inaccurate. Inefficient knowledge transfer can negatively impact operational efficiency.

In contrast, AI can be used to help retain your company's institutional knowledge by learning and recording what's normal and what's not normal about your IT operations, such as cloud configurations and specialized business applications. In short, the system gets smarter and more accurate on an ongoing basis. Autonomizing operations means that any specific processes required to maximize uptime can be preserved and recalled any time they're needed.

To further refine and improve AI outcomes, your operational data can be augmented with enriched external data, including weather reports, world news events, social media posts and Internet of Things (IoT) data. For example, you can immediately act on new business insights by understanding how the supply chain may be affected by weather events, which may impact the traffic volume and patterns. Or you can receive external information about a new security issue for your server, which can influence how IT operations collaborates with development teams to preemptively patch and protect your systems with the least possible downtime.

04 Act: Apply automation to prevent issues before they impact business

IT automation has evolved far beyond creating simple efficiencies and cutting costs. When driven by AI, automation can create better experiences with speed, enhance employee productivity, streamline operations and help build lasting customer loyalty. Adding AI to identified IT events supplies the guidance automation needs to expedite autonomous actions—activities are completed consistently and reliably without human intervention. Automation frees skilled resources to take on higher-value work that can improve your bottom line—like adding new features to customer-facing apps or working on new products that provide additional sources of revenue.

For example, the process of provisioning a new cloud instance may be relatively simple, involving say up to 12 steps. But will a human operator complete every step, in the right order, every time? Automation can, and without lag time. Once approval is received, the automated actions are completed in a consistent way, so your IT operations produce higher-quality and more compliant results. And because automation can easily multitask, speed is dramatically accelerated.

Combining the power of AI with automation opens the door to other intelligent workflows that maximize skilled labor value. For instance, infused AI may determine a customer service request can be handled by a chatbot instead of a live service agent. The system also understands when an automated response won't be sufficient and will then route the request to a qualified live agent, improving the customer experience and cutting wait times.

By way of illustration, health insurance provider Anthem of the United States worked with IBM Consulting™ to modernize its systems, integrating data and processes, resulting in

1,000,000 customer issues corrected through automation—including 85% of high-volume issues addressed without human intervention.[6]

With automated IT operations in place, issues can often be proactively addressed before they seriously affect customers. Both customers and employees appreciate the speed of resolution and the ability to complete essential tasks without delay or disruption.

05 IT control tower: Visualize and monitor operations end to end

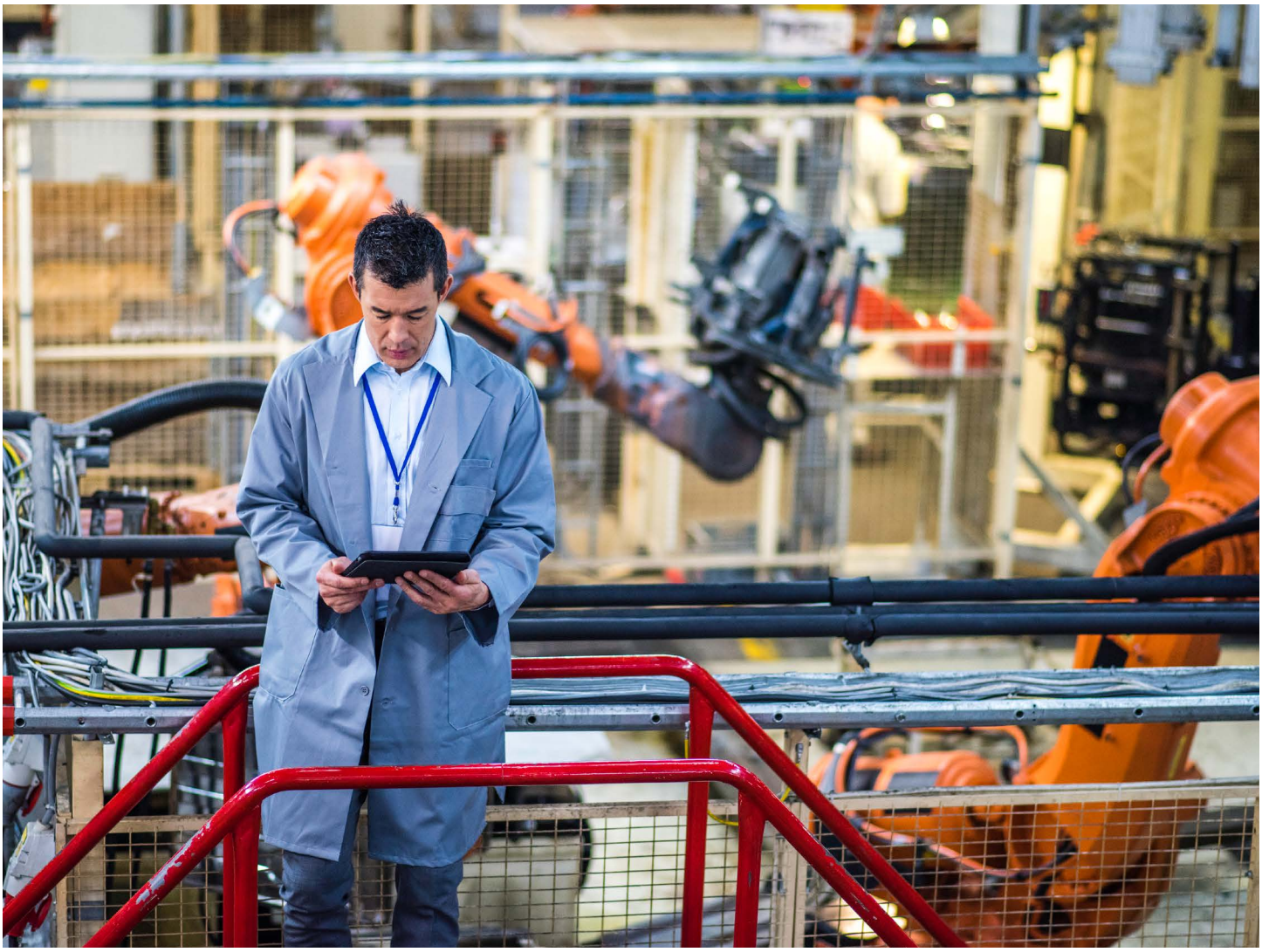
An IT control tower is where you typically surface operational data from all segments of your IT environments.

Once you've made improvements to gathering data in your hybrid cloud estate, infused AI to make sense of it and deployed automation across your IT estate, you'll have the opportunity to add observability at the top level that oversees IT operations end to end. By incorporating a collection of specialized applications as a central hub of data collection for your AI and analytics, an IT control tower provides a comprehensive, system-wide view of how your operation is functioning.

It's a unified dashboard with data to drill down into any area you need to inspect more closely. You can see detailed application performance data and how resources are being managed, particularly cloud resources. It's a single place where you can get the data you need to optimize how applications and resources are performing.

The CIO can use the dashboard to understand how much time a fix is taking and how many problems are involved, which helps the CIO allocate expenditures to the correct department or business unit. The CTO can use it to see the architectures involved and determine if there needs to be a change in the products or providers being used. And the CEO can access a wide variety of business metrics when the control tower data is ported to business intelligence applications.

The control tower is also the best place to do root cause analysis of alerts, events or anomalies in real time. Site reliability engineers (SREs) can immediately begin digging deeper to find out if problems are hardware-driven, caused by faulty code or an architecture issue that can be addressed. In minutes, engineers can determine the root cause and recommend the best way to address it, so it doesn't happen again.

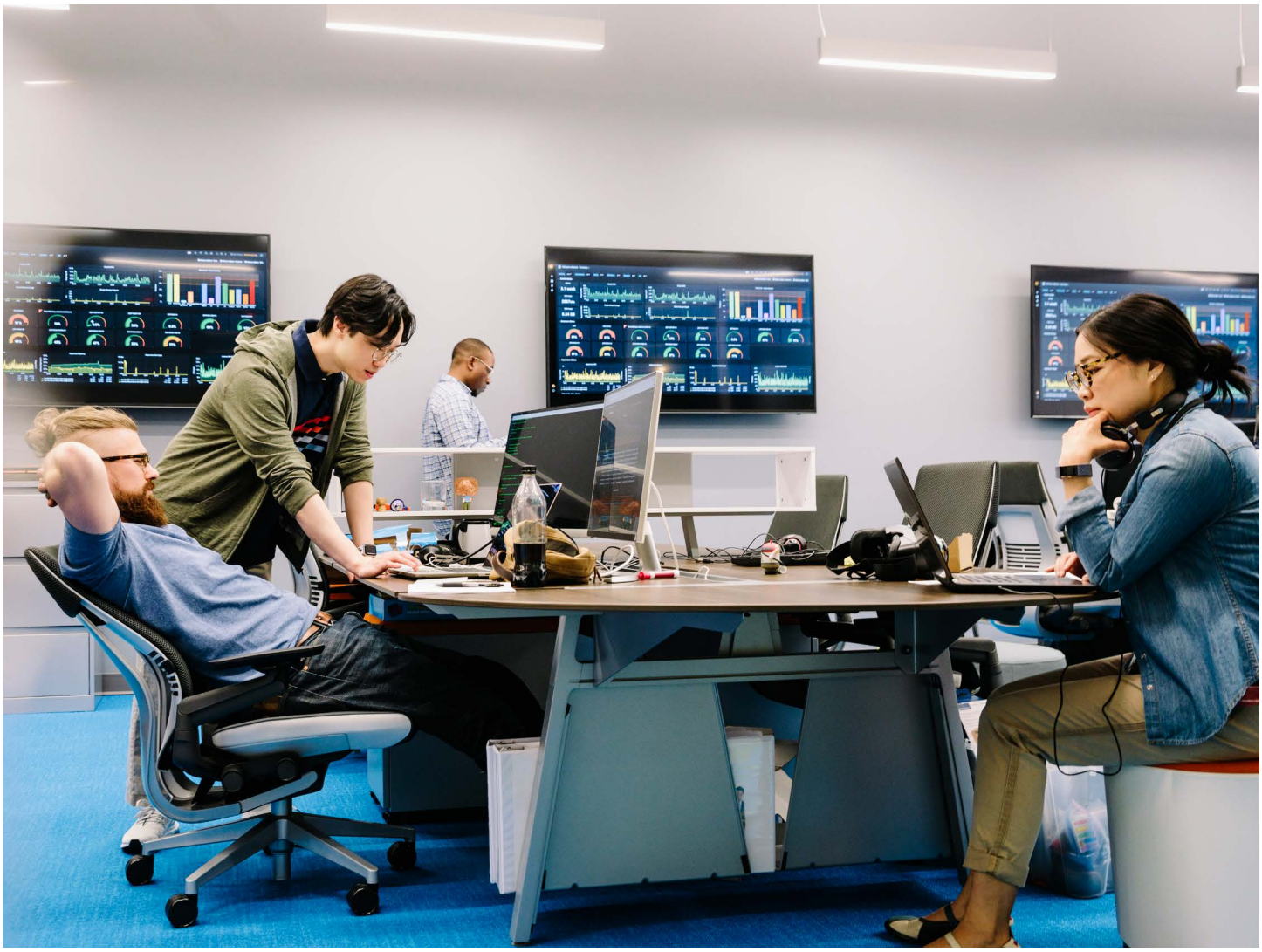


06 How to implement autonomous IT operations

As we've discussed throughout this white paper, autonomous IT operations in your hybrid cloud estate have many advantages. Until you take advantage of the capabilities to simplify, streamline and automate IT functions, you could be facing a lot of challenges, including:

- Increasing costs without a consolidated view of IT spending and resources, making it difficult to optimize expenses
- Missing business opportunities due to slow provisioning of new applications and services, or too many unexpected outages
- Meeting escalating security demands and shifting regulatory compliance requirements that impede growth
- Discovering many of your employees have outdated skill sets that leave you without the necessary resources to optimally manage your IT estate
- Wasting time and money trying to integrate new cloud platforms with existing systems and older solutions
- Lacking access to data locked in previous systems and not having real-time visibility into many of the layers of your IT stack
- Failing to maximize the value of individual applications and investments to meet business demand

The first decision to make—and perhaps the most crucial—is how to fully implement your autonomous IT operations transformation. This kind of transformation journey is most effectively achieved with the help of a partner who has a demonstrated track record, as well as a strategic vision that embraces your entire organization. And you want a partner who can help you make progress in this modernization without disrupting the current flow of business.



07 How IBM Consulting can help

IBM Consulting delivers high-quality and innovative hybrid cloud management services to our clients, so that their technology enables their business objectives and accelerates the cloud journey to unleash the full potential of their technology investments.

We help clients reduce their total cost of ownership and lower maintenance of their applications and data, managing custom and enterprise applications on cloud by using capabilities in intelligent automation, self-healing, FinOps, DevSecOps and SRE. And as a top-tier partner with leading application and cloud providers, we help migrate, build and manage each of your applications to your platform of choice.

IBM Consulting strategic partners[8]

Adobe	Technology and Consulting Partner	6,300+ certifications
AWS	Platinum Partner	10,000+ certifications
Google Cloud	Premier Partner	800+ consultants
IBM Cloud®	IBM Technology Partner	170+ products and services
Microsoft Azure	#1 Certified Global Partner	38,000+ global Microsoft consultants
Oracle	Oracle Partner for 35+ years	2,000+ certifications
Red Hat®	IBM Technology Partner	40%–50% faster time to market
SAP	Gold Partner	25,500+ certifications
Salesforce	Global Strategic Implementation Partner	10,000+ certifications
Workday	Certified Global Systems Integrator Partner	2,300+ certifications

We provide clients with specialized services for increased security, efficiency and visibility, such as DevSecOps, automation, quality engineering, platform engineering and service management.

By choosing IBM Consulting as a partner in their transformation journey, our clients gain access to industry experts with an innovative way of collaborating. Our IBM Garage™ methodology is ideally suited to transform your IT operations, no matter your industry or where you are on your transformation journey.

Together we'll ideate, build, measure, iterate and scale solutions seamlessly with our end-to-end framework of design thinking, agile methodology and DevOps practices. We'll help you achieve speed to value, upskill your talent and adopt breakthrough technologies through the partnership created with your team and a diverse set of IBM experts in business, design and technology.

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Footnotes

1 Automation and the future of work: Creating intelligent workflows across the enterprise, IBM Institute for Business Value, 22 July 2020.

2 Worldwide Application Services, 2023, IDC, Doc # US50037816, January 2023.

3 Outage Resolution Taking Too Long? Focus On Changes, Forbes, 11 May 2020.

4 Based on results of 451 Research's Voice of the Customer: Macroeconomic Outlook, Corporate IT Spending, Digital Transformation and Cloud Services 2020 survey of 237 IT decision-makers, reported in Total Automation: The Future of Intelligent Enterprise Execution, 451 Research, July 2022.

5 ITIC 2020 Global Server Hardware, Server OS Reliability Report, Information Technology Intelligence Consulting Corp. (ITIC), April 2020.

6 Based on IBM's internal analysis of aggregated performance data observed from engagements with clients from 2021, which showed that Digital Operations (the integrated autonomous operations solution) achieved 60% reduction of incidents with one client. Actual results will vary based on client configurations and conditions and, therefore, generally expected results cannot be provided.

7 AIOps adoption grows with the shift of data- and business-driven DevOps, 451 Research, S&P Global Market Intelligence, 26 August 2022.

8 IBM Consulting capabilities book, IBM Institute for Business Value, October 2022.

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New Orchard Road
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Produced in the United States of America
February 2023