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The top five APM challenges
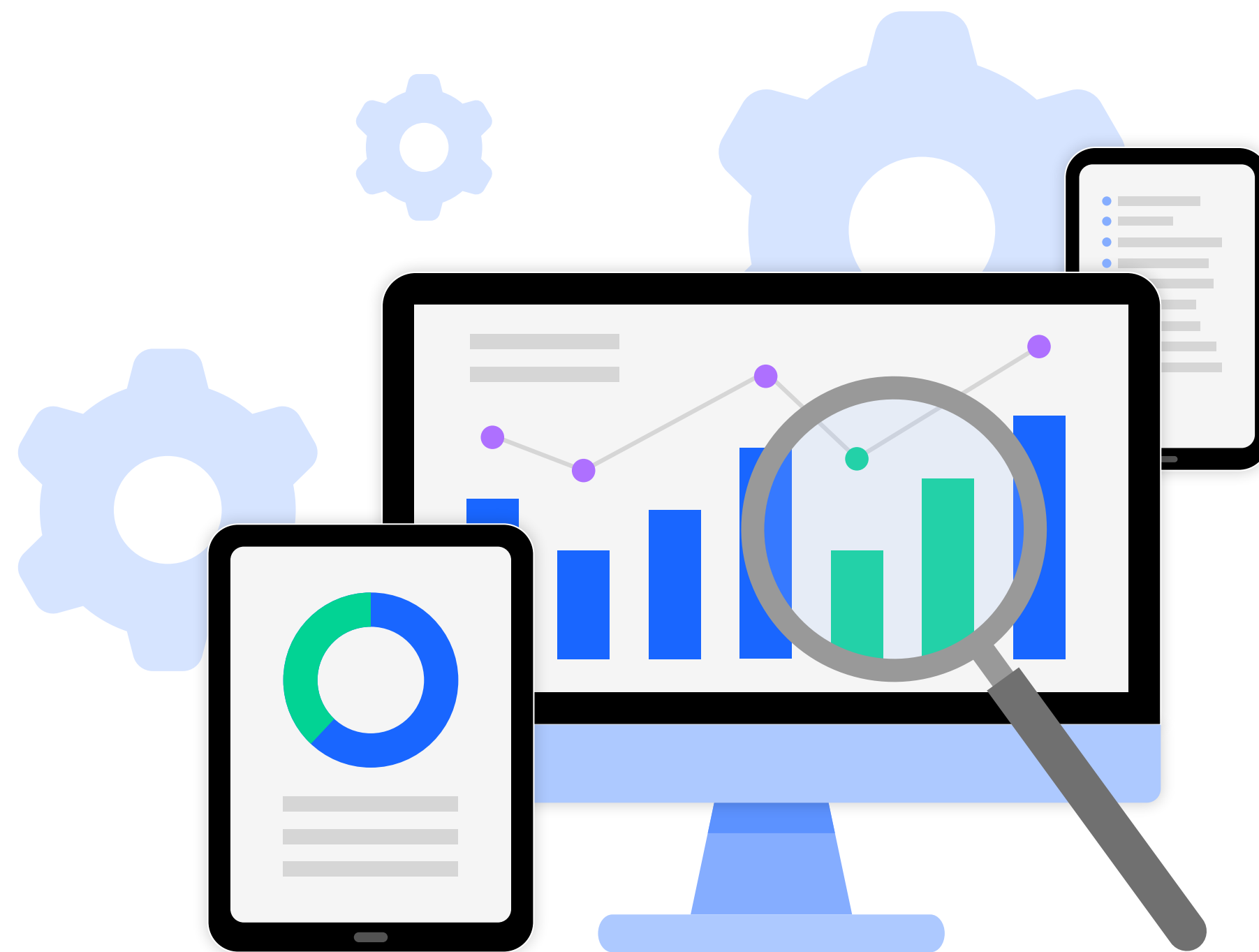
Charting an application performance monitoring roadmap

The APM journey begins

Digital transformation is accelerating. IT environments are becoming more powerful, more adaptable, and more complex. Therefore, enterprises are turning to application performance monitoring (APM) and observability to deliver reliable, real-time visibility across technology stacks.

But APM isn't a silver bullet. To deliver on its potential, organizations need to recognize key challenges, understand their impact, and implement strategies that help to unlock the power of APM and drive the journey toward observability.

What's inside

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What is application performance monitoring?

[Application performance monitoring](#) is the process of tracking and collecting key software metrics to pinpoint potential problems and identify opportunities for improvement. Historically, APM platforms have provided insight into application traces and spans so IT teams can increase system availability, optimize service performance, reduce response times, and improve the user experience. More recently, companies have turned to observability technologies, which include traces and spans and further incorporate other telemetry sources, such as metrics, logs, and business events.

The capabilities of application performance monitoring

APM is a core aspect of observability that helps companies shift from observing their IT environments to acting. While continual monitoring of application telemetry data helps organizations understand what's happening across software stacks, monitoring tools enable teams to identify targeted actions that address existing problems or optimize current processes. According to research firm Gartner, the capabilities of APM and observability tools include:[1]

The observation of an application's complete transactional behavior

Automated discovery and mapping of an application and its infrastructure components (including cloud services)

Monitoring of applications running on mobile (native and browser) and desktop browsers

Identification and analysis of application performance problems and their impact on business outcomes

Native integration capabilities with automation and service management tools, as well as native integration with public cloud providers

Analysis of key performance indicators (KPIs) and user journeys — for example, login to check-out

The ability to perform interactive interrogation of multiple telemetry types (such as traces, metrics, and logs) to detect "unknown unknowns" — that is, the ability to indentify underlying issues to unexpected events and gaps in telemetry coverage

Application security functionality delivered via a common agent or framework for APM

Effectively implemented, APM enables teams to improve application stability, reduce the total number of performance incidents, enhance problem resolution, increase the pace and quality of software releases, and optimize infrastructure utilization. AI-powered observability further extends these benefits to metrics, logs, and business events with AI to provide instant answers.

[1]Gartner, Magic Quadrant for Application Performance Monitoring and Observability, Padraig Byrne, Gregg Siegfried, Mrudula Bangera, 7 June 2022. GARTNER is registered trademark and service mark of Gartner, Inc. and MAGIC QUADRANT is a registered trademark of Gartner and/or its affiliates in the U.S. and internationally and are used herein with permission. All rights reserved. Gartner does not endorse any vendor, product or service depicted in its research publications, and does not advise technology users to select only those vendors with the highest ratings or other designation. Gartner research publications consist of the opinions of Gartner's research organization and should not be construed as statements of fact. Gartner disclaims all warranties, expressed or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose.

How does APM compare to observability?

While APM and observability are similar, they're not identical.

Observability is the ability to measure a system's current state based on the data it generates, such as logs, metrics, and traces. It requires the real-time collection of data from multiple sources, the analysis of this data, and the resulting investigative action taken once patterns in data are identified. Observability is a dynamic practice that changes over time in response to both current conditions and evolving operations. It is critical to ensure consistent software and service performance.

Meanwhile, APM is one process within the larger scope of observability.

By collecting and curating data about application performance, connections, and interactions, APM tools make it possible to pinpoint potential problems and streamline application integration.

As a result, even the most advanced APM capabilities can take companies only so far if they're not connected to larger observability frameworks. Put another way, while APM offers visibility into the operation of critical components, observability provides the big picture.

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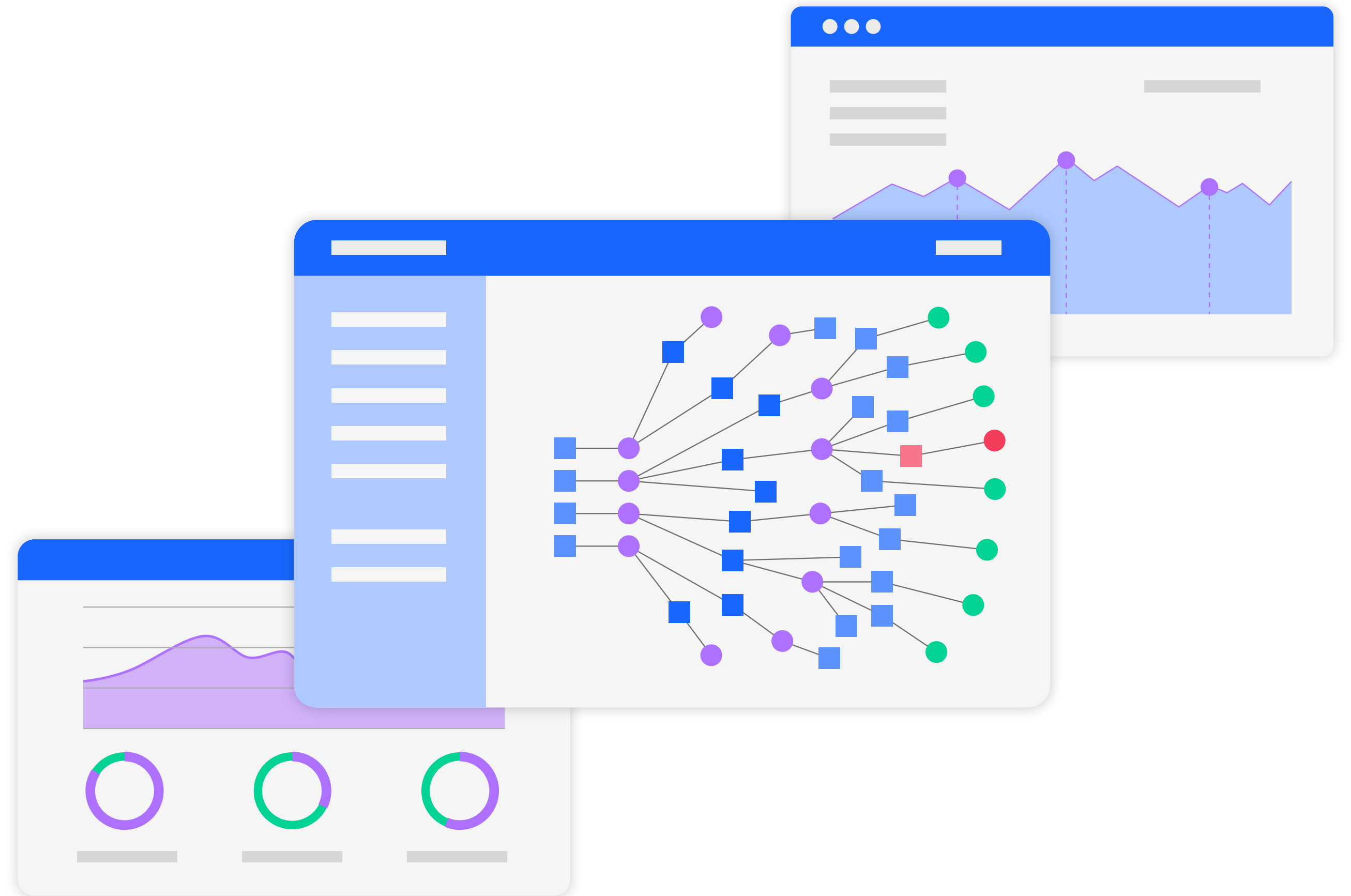
Four drivers of APM adoption

While the benefits of APM make its value clear, adoption has increased exponentially over the past few years. So, what changed that puts accurate performance management at the forefront of IT initiatives?

Four drivers underpin this ongoing shift:

1. The accelerating pace of digital transformation

2. The increasing volume of cloud data

3. The increasing costs of downtime

4. The shifting of response priorities
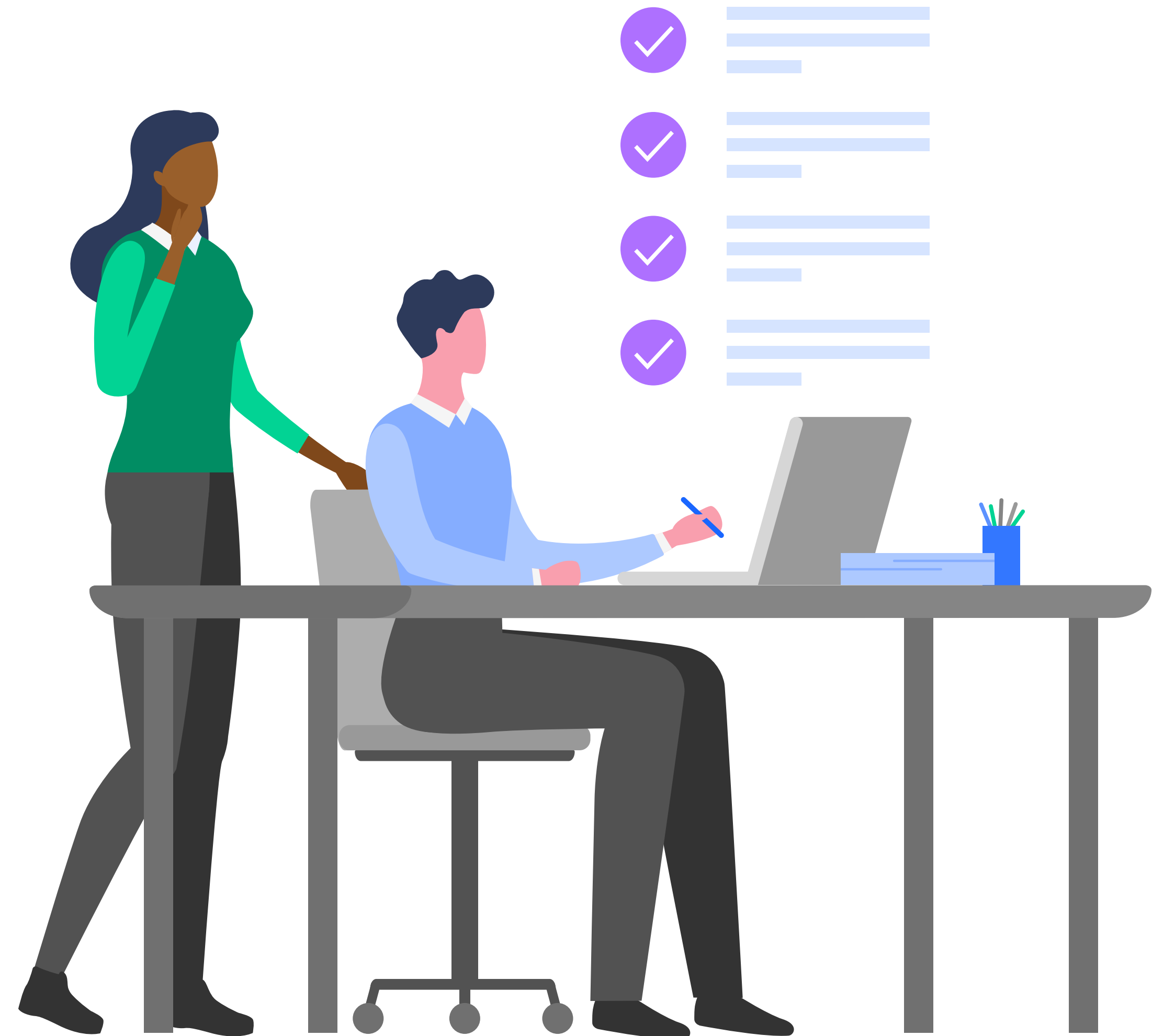
The accelerating pace of digital transformation

[Digital transformation](#) is critical for companies to stay competitive in markets dominated by mobile devices and always-on connections. As a result, businesses spend time and money creating roadmaps and deploying technologies to replace manual processes and enable automated functions. However, this transformation results in reduced visibility across IT environments, coupled with massive amounts of data generated at every level of the organization.

As [Gartner](#) notes, this has created a situation in which 53% of companies "remain untested in the face of digital challenge and their digital transformation readiness [is] therefore uncertain."

When APM capabilities are embedded in observability platforms, businesses can better manage digital transformations from end to end.

The increasing volume and complexity of cloud data

Do more clouds mean more problems? When it comes to data, almost certainly.

While the benefits of the cloud are undeniable, the use of multiple purpose-built cloud deployments has created a new challenge: telemetry data. With the volume of data that comes with every transaction, login, and sensor, the speed at which this data is created and consumed, and the variety of devices that generate and handle this data, cloud computing naturally increases the complexity of IT operations.

Application performance monitoring is critical to understanding how cloud-native apps are performing and opportunities for improvement. An integrated observability and APM platform offers a way for organizations to streamline multicloud management by making it possible to collect and correlate data from multiple sources simultaneously, in turn helping teams better manage the volume of cloud-created data.

The increasing costs of downtime

IT system downtime costs continue to grow. In 2019, for example, just 39% of IT outages resulted in losses of $100,000 or more. In 2021, that number grew to 60%. What's more, outages costing more than $1 million grew from 11% to 15%. Both human error and third-party IT providers have contributed to this downtime. Over the past three years, nearly 40% of organizations suffered an outage because of human error. And in 2021, commercial IT providers caused some 70% of all outages.

This creates a situation in which downtime is not only more costly on average but lacks a single cause. For example, IT staff who forget key processes or choose to ignore specific protocols could put networks or services at risk. Issues can also stem from service provider misconfigurations or from their failure to implement basic security protocols.

To help mitigate the likelihood and effect of these attacks, companies are investing in APM capabilities to pinpoint potentially problematic behavior — whether internal or tied to third-party providers — and act before small issues become big problems.

The shifting of incident response priorities

In 2022, the average time required for companies to detect data breaches reached 277 days — just more than nine months for companies to detect, identify, and contain data breaches. The average cost of a data breach in the U.S. also rose to $9.44 million.

If companies could shorten this response time to 200 days or fewer, however, they could save up to $1.12 million. Even better? They could prevent breaches from happening in the first place with the use of intrusion detection and mitigation tools.

However, in practice, preventative monitoring requires more than tooling; it requires shifting priorities from a reactive to proactive response. With real-time data about activities across both local and cloud stacks, companies are better equipped to spot attacks before they have a chance to compromise critical systems.

That said, achieving this goal requires access to a wealth of application data — data that modern, integrated APM and observability platforms naturally provide.

Five challenges for effective application performance monitoring

APM is a framework to improve application monitoring and management and is typically paired with observability to get the most complete coverage and benefits. However, it isn't a cure-all. The sheer volume of cloud-connected services, mobile applications, and local devices provide a near-infinite reservoir of data that can help companies identify what's happening across their application stack and make changes that improve overall performance.

However, the transition from framework to function comes in using this data to the best effect.

In practice, five challenges can frustrate APM efforts:

1. Inconsistent instrumentation and maintenance

2. Reliance on siloed tools

3. Lack of decision-making context

4. Missing links to business impacts

5. Separation of symptoms and root causes
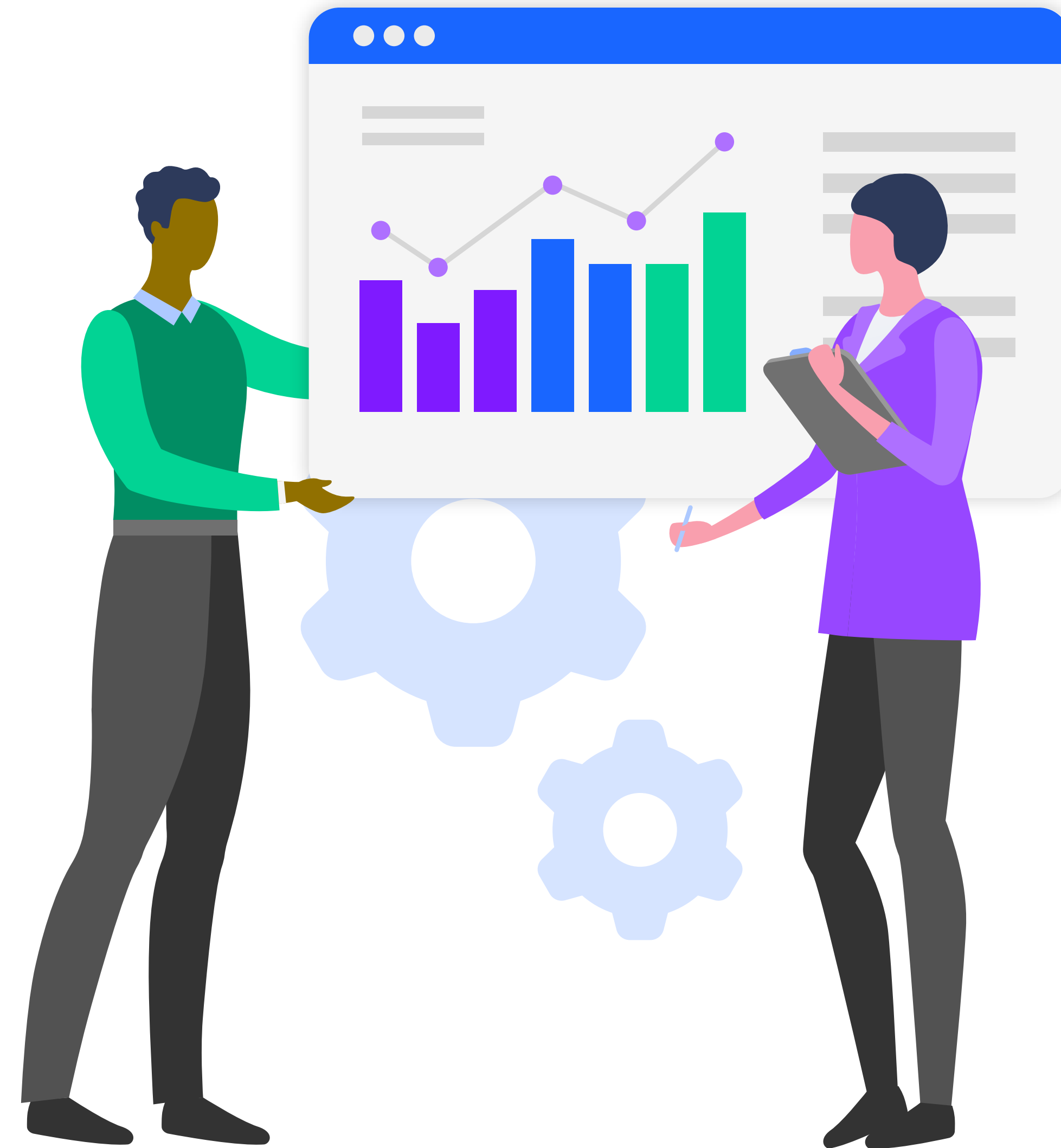
Quick-change artists: Inconsistent instrumentation and maintenance

Microservices architecture enables companies to create composable, transferrable services that are used across multiple environments to build multiple frameworks. The challenge is the small size of these services makes them easy to deploy, in turn making service sprawl likely.

If these services aren't consistently maintained and updated, APM data could be inaccurate and out of date, in turn reducing their value to the organization. What's even more worrisome is this challenge augments as microservice volumes expand — add in multicloud adoption, and exponential inconsistency is possible.

It takes a village: Reliance on siloed tools

While it often makes sense for teams to use customized tool sets that help them achieve specific goals, individual tool sets can fuel a larger problem: silos.

Consider a purpose-built financial application designed to help teams handle loan applications. Given the confidential nature of the data, it makes sense to at least partially isolate this tool from larger networks. However, greater separation from central systems makes it more challenging to effectively understand application health.

Shift-left processes are increasingly important to integrate security and other fundamental operations as early as possible in the development lifecycle. From canary deployments that identify potential problems to blue-green approaches that allow the gradual migration of traffic from one version of an application to the next, moving left is now the right approach for IT.

Addressing this issue requires the recognition that APM tools can't do it all. Instead, companies need to adopt observability that incorporates more traditional data, such as metrics and logs, and then integrate it with APM outputs to increase visibility.

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Lack of decision-making data context

More data doesn't always equal better decision making. Why? Data context.

Without this data context, companies can't understand the relationship between data-generating entities. These entities could be anything: two cloud-based apps that interact, a local service that meets a hybrid application at the edge of the network, or something else entirely. Simply collecting data about what these entities are doing and the data they're exchanging is the first step to better decision making. But if teams don't understand the why behind the what, it's almost impossible to see the bigger picture.

Connecting the dots: Missing links to business impact

APM data offers insight into current operations: How are applications performing? Where are conflicts occurring? What issues are isolated, and which are repetitive?

What APM can't tell companies is how much of an impact these issues have on end users. Are performance problems small irritations or large inconveniences? Do they add a few minutes to current processes, or are they derailing normal operations? This goes beyond user satisfaction: If teams can't get their work done because apps aren't working as intended, businesses may lose time and money.

Mind the gap: Separation of symptoms and root causes

The sheer number of microservices that business applications use empowers agility but also leads to gaps in visibility. When something goes wrong, which services are responsible? More importantly, are these microservices the root cause or simply symptom indicators?

Consider a sudden slowdown in an enterprise-wide communication app. While application performance monitoring tools can identify the presence of an issue, they may have trouble pinpointing the microservice responsible for the problem, especially if the application uses a combination of purpose-built and open source services. What's more, even identifying the suspect service doesn't guarantee it's the source.

As a result, it's critical to go beyond basic APM with integrated AI capable of finding relevant data quickly and jumping the gap between cause and effect.

How a modern application performance monitoring platform can help

APM is now a must-have for organizations to understand incidents within disparate technology stacks — but challenges remain. With the Dynatrace observability platform, companies can tackle these challenges head-on.
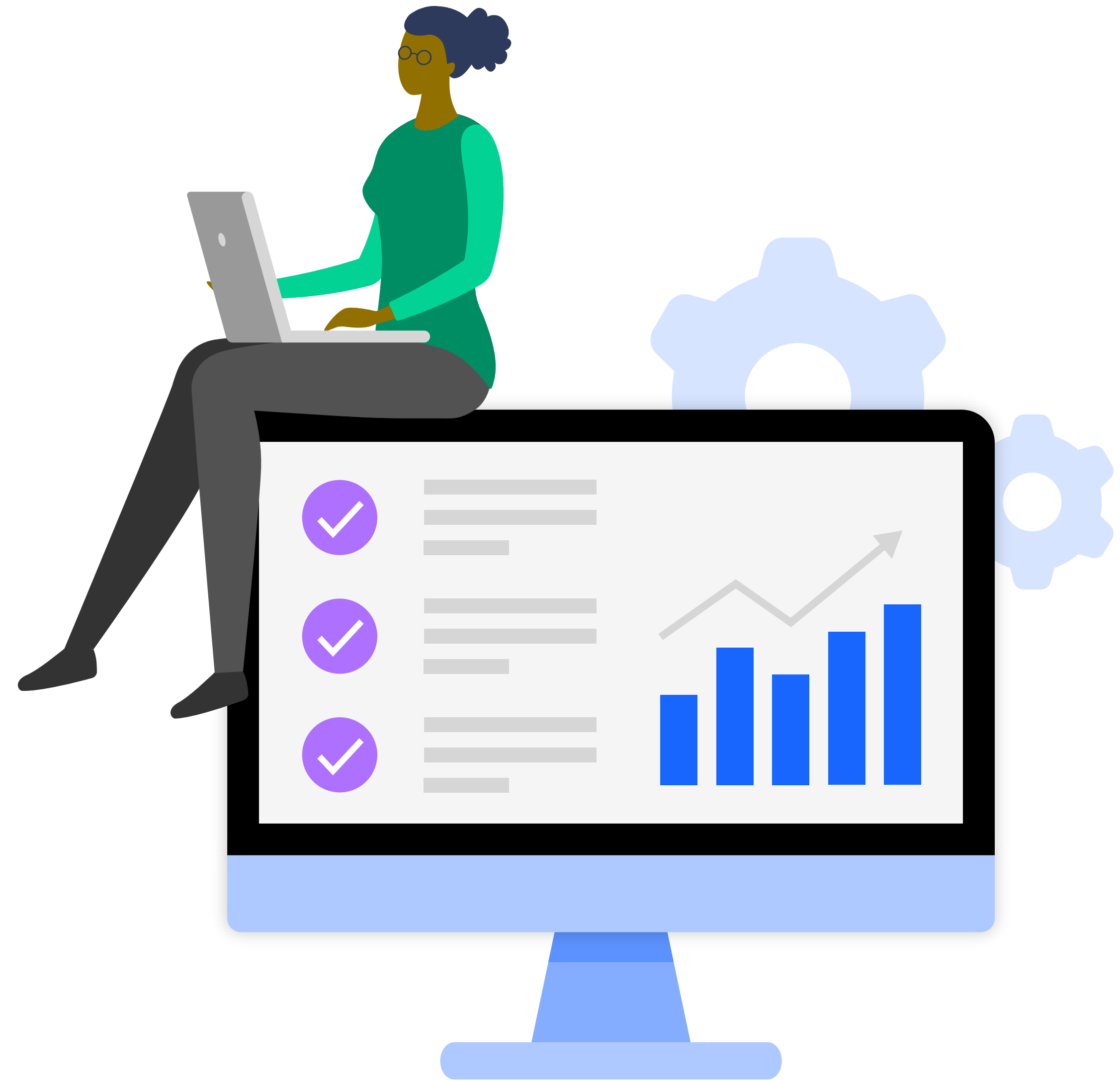
Key components of Dynatrace APM include the following:

Integrated observability platform

APM tools are often standalone services that capture key data about application and microservice operations and little else. Meanwhile, the Dynatrace platform captures metrics, traces, logs, and business data to provide complete coverage. It uses artificial intelligence and automation to deliver a precise, context-aware analysis of the complete application environment, regardless of app or service location.

End-to-end visibility

While APM provides key insights into service operations, traditional logs and metrics are also critical for companies to gain complete visibility. Dynatrace PurePath automatically captures and analyzes transactions end to end across every tier of your application stack to provide code-level visibility into web apps, mobile apps, microservices, and serverless functions. At the same time, Dynatrace also captures metrics and log data and automatically contextualizes all these telemetry sources to provide instant answers — not just more data.

AI-enabled analysis

Data without context won't deliver desired outcomes. Powered by the Davis AI engine, the Dynatrace observability platform lets companies connect the dots to discover key dependencies, visualize app topologies, and automatically detect anomalies.

APM tools are essential for IT operations and business success. But they're not silver bullets.

To capture key advantages, companies need the right roadmap for success. For more information on what AI-enabled, end-to-end observability and APM can deliver, visit our website.

Automatic and intelligent observability for hybrid multiclouds

We hope this ebook has inspired you to take the next step in your digital journey. Dynatrace is committed to providing enterprises the data and intelligence they need to be successful with their enterprise cloud and digital transformation initiatives, no matter how complex.

Learn more

If you are ready to learn more, please visit www.dynatrace.com/platform for assets, resources, and a **free 15-day trial.**