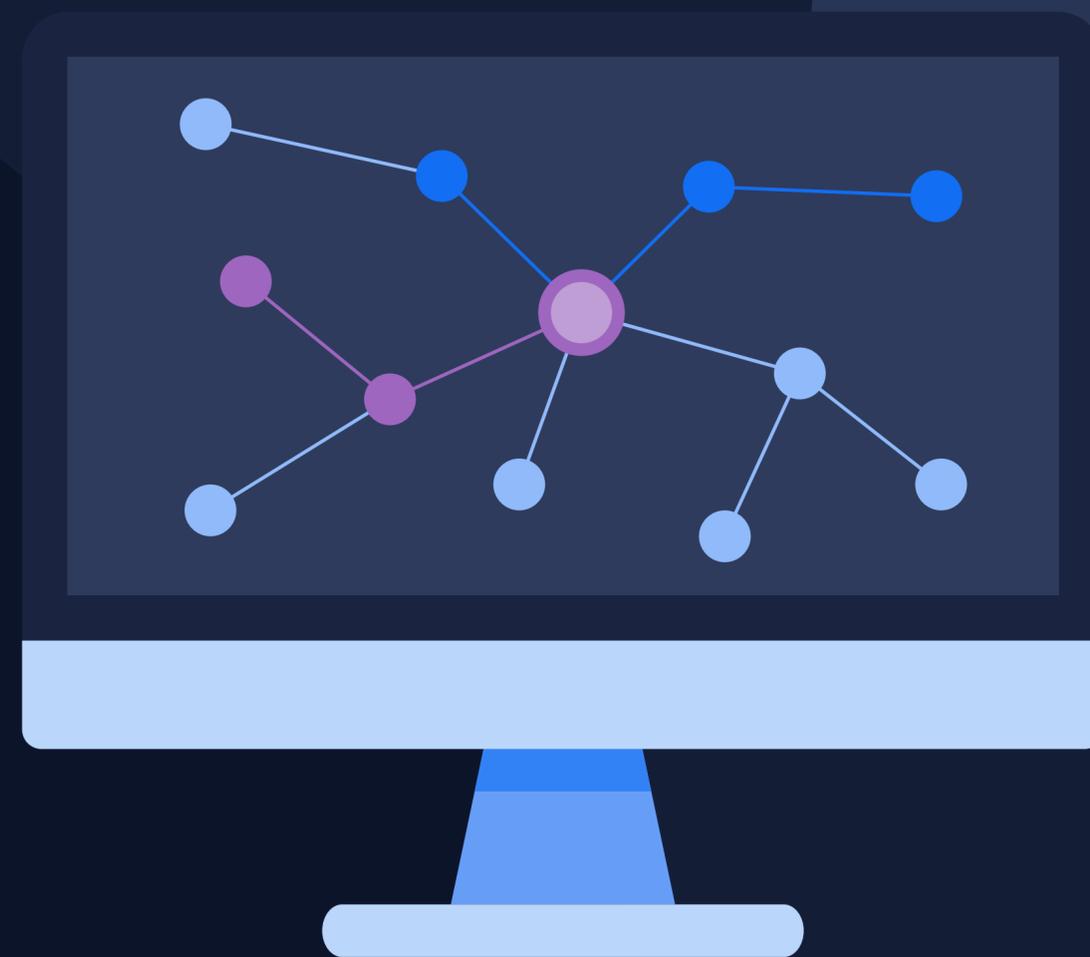




Developing an AIOps strategy for cloud observability



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INTRODUCTION

Modern clouds require a modern AIOps strategy



Many professionals who manage IT environments today are feeling trapped between a hammer and an anvil.

The hammer takes the form of ever-increasing complexity within the IT architectures, tools, and technologies they use — especially in cloud-based environments. The anvil is the constantly intensifying pressures on IT teams as they manage their complex technology stacks.

Gone are the days when applications run as monoliths using on-premises infrastructure. Today, apps are distributed across far-flung multicloud and hybrid cloud environments managed by complex orchestration tools. These environments are highly dynamic, with containers and microservices that come and go. This changeability makes managing these environments challenging.

Customers expect high-functioning applications that load in seconds. This high bar requires IT teams to constantly innovate and update applications frequently, often multiple times each day. As a result, teams need to find and resolve problems in real-time before they disrupt users.

A steady stream of cyberattacks and vulnerabilities such as [Log4Shell](#) also requires engineers to adhere to rigid security standards, even as they navigate constant change. Organizations are increasingly incorporating open-source code, which makes it a priority to keep track of third-party libraries and modules, and to continuously identify and fix any security vulnerabilities.

Within this highly competitive business environment, failure to meet the demands of modern IT can prompt customers to defect to competitors. Unaddressed performance and security issues may also undercut business efficiency.

A new key to digital transformation: AIOps

With enormous complexity encroaching from one side and myriad requirements on the other, what can IT leaders do?

To respond to this increasing pressure, IT organizations must embrace new strategies designed for the challenges of modern cloud environments. They need technologies such as AIOps — artificial intelligence for IT operations — which uses AI to automate and improve the efficiency of the software development lifecycle.

Armed with an AIOps strategy, teams not only reduce manual processes when contending with endlessly complex, fast-moving environments but also eliminate manual processes in key areas of the IT lifecycle. In turn, AIOps enables teams to keep pace with constantly increasing change rates and scale in any type of environment.

This e-book outlines the central role AIOps — and an AIOps strategy — play in enabling teams to overcome the increasingly complex, multicloud challenges they face as they digitally transform. This e-book also describes successful, real-world implementations of AIOps and outlines best practices for building an AIOps strategy that drives faster innovation, increases efficiency, and results in better business outcomes for every organization.

CHAPTER 1

What is AIOps?



Since [Gartner introduced the term in 2016](#), the implementation of AIOps has caught on.

[IDC projects](#) that 90% of global 2,000 organizations will deploy AIOps tools for making decisions on workload placement and automated remediation by 2026, ensuring greater operational resiliency and organizational flexibility.

To understand what an AIOps approach means in practice, let's explore different approaches to AIOps and how it works.

Approaches to AIOps

There are two main approaches to AIOps. The first uses traditional machine learning to identify correlations between IT events. With this approach, AIOps tools strive to determine whether failures in the various interconnected components of a complex cloud environment stem from the same root cause, or are unrelated issues.

These correlations can provide some useful insight for assessing the scope of a performance problem. But to identify a definitive root cause, engineers must piece together correlations in dashboards, alerts, logs, and other data to confirm what happened.

The second, more modern approach to AIOps is known as deterministic — or causal — AIOps. This approach extends beyond simple correlation and machine learning. It uses contextual data and deterministic AI to precisely pinpoint the root cause of cloud performance and availability issues, such as blips in system response rate or security threats. Instead of correlating two or more events based on circumstantial evidence, causal AIOps identifies the exact root cause that triggered those events. In turn, this modern approach to AIOps guides engineers through incidents with precise, real-time, explainable answers, rather than simply providing best guesses.



Machine learning AIOps



Deterministic or causal AIOps

From dashboard to automatic diagnostics

Traditional correlative AIOps is like a check-engine light on in a car's dashboard: It tells you something is wrong, and it may point to what is affected. But it doesn't explain everything you need to know about why the problem happened or how to solve it quickly.

In contrast, deterministic AIOps is like a diagnostic tool that tells you exactly which component failed and how to fix it. Instead of guessing about root cause, you can focus your energy on remediation.

What's more, when integrated across a technology stack, deterministic AI can automatically remediate problems without requiring human intervention. For example, if a system experiences a network bottleneck or an application error, developers and SREs

can get a notification about an issue, what caused it, and how the system resolved it, rather than having to troubleshoot and reconfigure the system manually. They can use their valuable time on other higher-impact tasks.

A deterministic AIOps solution also makes constantly changing cloud environments easier to manage. An automated, deterministic AI engine doesn't have to be customized for each application or cloud service it supports. From the moment a new resource appears in a cloud environment, or an existing resource changes, a deterministic AIOps solution can automatically discover it with full visibility in context. This automatic discovery eliminates the need for manual configuration every time there's an update, which saves teams time and makes scaling a snap.

How AIOps works

AIOps solutions rely on a core set of capabilities:



Observability

Observability involves the collection and analysis of logs, metrics, and traces to identify relevant system trends and anomalies, and it is critical to an enterprise-grade AIOps solution. It provides the basis for understanding the activities within highly dynamic, large-scale IT environments. Many organizations rely on open-source standards such as OpenTelemetry to collect data. This enables businesses to maximize the amount of data they can observe and, in turn, maximize their ability to detect and fix problems, innovate faster, and drive greater efficiency.



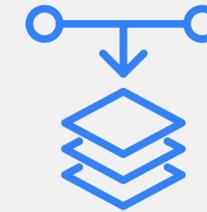
Automation

The core purpose of AIOps is to automate complex processes that would otherwise require significant time and manual effort. AIOps can automate myriad processes throughout an IT organization — including traditional IT operations, cloud operations, DevOps, and security operations.



Extensibility

Because modern IT environments are distributed and dynamic, AIOps must be highly extensible. An AIOps solution needs real-time awareness across all layers of the software stack and be able to integrate with any framework, technology, or platform.



Actionability

Even with basic AIOps tools, merely telling teams something is wrong is not enough. Instead, AIOps solutions must move beyond simple alerting dashboards and provide contextual analytics. With context about precise root causes, developers and SREs can take clear and immediate action and automate responses. This is how organizations turn AIOps capabilities into an AIOps strategy.

Going further with a deterministic AIOps approach

Beyond the basic capabilities, a deterministic approach to AIOps takes operations to the next level to provide benefits to the business. For example:



Root-cause determination to speed and automate remediation

Deterministic AIOps positively identifies the root cause of an issue — as opposed to merely correlating some relationships between two or more issues. Definitive root-cause determination enables teams to respond immediately and automate remediation, which eliminates the need for time-consuming war rooms.



Business analytics with real-time context

The ability to detect issues continuously and in real time is critical, especially in fast-moving cloud environments where some resources (such as containers) are ephemeral and change constantly. Deterministic AIOps achieves this by analyzing streaming data in real time without relying on time-consuming data training and machine learning models to identify relevant information.



Automated remediation

Deterministic AIOps can solve problems automatically. In turn, engineers can shift from fixing relatively simple problems to focusing on mission-critical challenges, such as planning and delivering new software releases, improving the user experience for customers, identifying end-user needs and integrating those enhancements into upcoming software releases.

CHAPTER 2

Why AIOps, and why now?



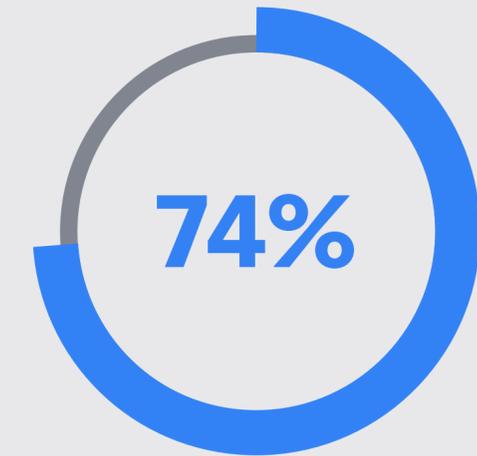
AIOps is not a new concept. Platforms marketed as basic AIOps solutions have existed since the mid-2010s.

Still, the past few years have witnessed an explosion in IT complexity on one hand, and steep user expectations on the other. Together, these trends make AIOps an increasingly important resource for businesses of all types. This includes web-scale companies with thousands of applications and millions of users, and virtually any organization that uses modern cloud-based platforms.

AI-enabled observability boosts DevOps

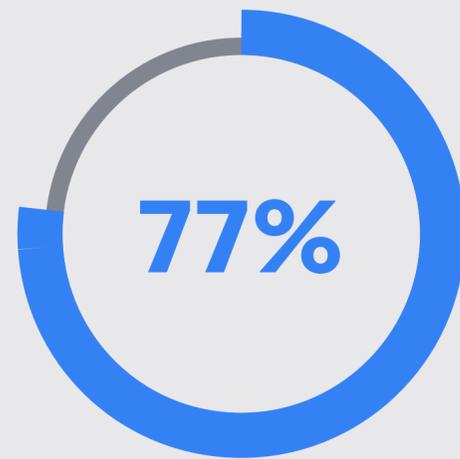
Dynatrace's recent Global CIO Report found that more than one-third of IT leaders reported a sudden increase in demand for cloud services as one of the top challenges that organizations faced in 2020 and 2021. Along similar lines, nearly half said they experienced an uptick in IT performance-related issues, partly because of the need to support distributed workforces in the era of remote work.

The increase in software delivery velocity that has resulted from widespread adoption of DevOps has created additional pressure on IT teams. Seventy-four percent of CIOs believe that end-to-end observability — which AIOps enables — will be essential to meeting DevOps goals in the future. A similar number of respondents say that having a unified, end-to-end platform that can seamlessly integrate DevOps toolchains will be critical in scaling DevOps beyond a single lighthouse project at their organizations.



of CIOs believed that end-to-end observability will be essential to meeting DevOps goals in the future.

Source: [Dynatrace Global DevOps Report](#)



77% of CISOs said the only way for security to keep up with modern cloud-native application environments is to replace manual deployment, configuration, and management with automated approaches.

Source: [Dynatrace Global CISO Report](#)

AIOps is needed to keep up with security demands

From a security perspective, too, it's clear that now is the time for AIOps to automate complex security workflows and ensure that released software is secure. In the same Dynatrace research, 77% of chief information security officers say that the only way for security to keep up with modern cloud-native application environments is to replace manual deployment, configuration, and management with automated approaches.

Coupled with the knowledge that, on average, organizations receive 2,169 new alerts about potential

application security vulnerabilities each month, it becomes clear that automating security risk identification and remediation is the best way to stay ahead of the fast-moving threat landscape.

Based on data like this, it's no surprise that adoption of AIOps is surging. From a total value of under \$1.75 billion in 2017, the AIOps market is projected to grow to over \$11 billion, according to [MarketsandMarkets research](#).

The business benefits of deterministic AI

Implementing any AIOps tool can help organizations contend with the challenges of modern cloud environments. But deterministic AIOps goes further than traditional approaches, which often struggle to keep pace with the ever-increasing complexity of these environments.

Reclaim your time

When an AIOps solution generates insights based on definitive causal relationships vs a correlation-based approach, teams can minimize time wasted on manual, repetitive tasks and troubleshooting issues. That's especially true when organizations leverage AIOps solutions that can perform automated remediation, which eliminates the need for engineers' manual resolution of issues.

Traditional AIOps approaches simply correlate data points, leaving it up to engineers to spend their time tracking down root-causes manually.

Could you really just ... innovate?

The benefits of minimizing manual work through deterministic AIOps extend beyond simply helping engineers work faster. With more time and precise insight into their systems, teams can deliver real value to the business by innovating new solutions and services, rather than simply maintaining what already exists.

Establish data-driven business resilience

Deterministic AIOps can also promote business resilience in the face of constant threats and unknowns. With AI-driven observability into business analytics and KPIs, such as feature adoption, app store ratings, and conversion rates, deterministic AI also enables IT organizations to make the best-informed, most strategic decisions about how the performance of their cloud environments affects the business.

Know — and improve — your users' experience

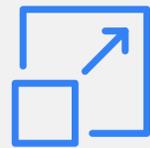
Deterministic AIOps also gives teams real-time visibility into the user experience so they can automatically discover problems before customers are affected. As a result, teams can invest resources and prioritize improvements based on business impact. This kind of automated insight enables teams to optimize spending and improve customer experiences, while enhancing the outcome of IT investments.

CHAPTER 3

The pillars of AIOps success



Embracing an AIOps solution is a good first step, but not all AIOps approaches are created equal. The best solutions integrate the following key pillars.



Scalability

AIOps should work with all your technologies without having to train data models. It should continuously learn in real time and scale as your IT environment grows.



Reliability

Insights from an AIOps solution should be consistent, reliable, and explainable. AIOps should deliver easily traceable and precise root-cause analysis so you don't have to guess between varying recommendations.



Observability

An AIOps solution should monitor metrics, logs, and traces across modern IT environments. A solution should also extend observability into open-source tools and analyze details at the code level.



Automation

AIOps should save time and free engineers to focus on higher-order tasks. An AIOps solution should automatically provide real-time insight so teams can automate workflows and remediation efforts.



Precision

Correlations are of little value if you have to verify the conclusion before taking action. An AIOps technology should provide precise root-cause analysis based on causation in context.



Explainability

An AIOps solution should enable teams to trace and explain the exact path of causation to aid troubleshooting. Explainability helps foster a culture of trust and shared responsibility.

CHAPTER 4

A modern AIOps strategy in action: How customers use AIOps



CUSTOMER STORY

Dynatrace smooths customer experience for Vitality

With Dynatrace, Vitality streamlined the mobile app customer experience — improving customer satisfaction and driving better business outcomes.

- Vitality, a health and life insurance provider, creates incentives for its customers to pursue a healthy lifestyle.
- Benefits redemption may invite errors, and customer frustration, as these tasks rely on a complex web of wearables, cloud technology, and partner ecosystems that need to interoperate.
- Addressing customer experience issues without automation creates manual, time-consuming intervention. Now, Vitality leverages deterministic AIOps to continuously identify the root cause of customer experience issues and automatically apply fixes without relying on human intervention.

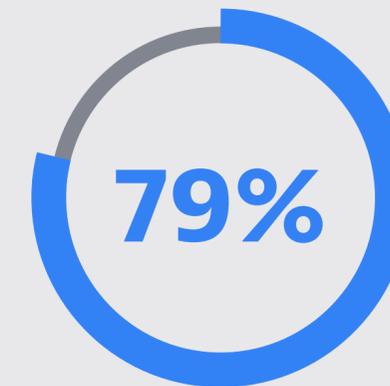
Vitality is a UK-based health and life insurance provider whose mission is to promote a healthy lifestyle among its 1.8 million members.

Vitality's principal mechanism to encourage wellness habits is through a rewards program for members who regularly exercise and eat a healthy diet. Members can redeem points for rewards, including movie tickets, wearables, or gym memberships.

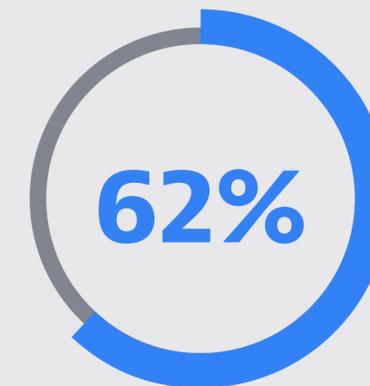
"We reward you for staying healthier," says Steve Amos, IT experience manager at Vitality.

An AIOps strategy is crucial for DevOps

Research indicates that an innovative AIOps strategy is crucial for maturing and scaling DevOps.



of respondents say extending AIOps beyond traditional use cases will play a critical role in the future success of DevOps teams



of respondents are investing in eliminating manual incident response

Source: [Dynatrace Global DevOps Report](#)

Measuring wellness brings infrastructure complexity

To measure customer behavior and reward healthy habits, Vitality needs a robust IT infrastructure that brings together many data sources and distributed architectures, including data from wearables, multicloud technology and partner ecosystems — all working together as customers redeem rewards.

But with this distributed data and its multicloud environments comes complexity. As a result, users may sometimes encounter problems when redeeming their reward points.

Prior to implementing a unified AIOps solution from Dynatrace, a customer would need to call Vitality to solve redemption issues. That was time-consuming for customers, who risked missing their movie or other rewards they were trying to redeem. The troubleshooting process was also manual.

Vitality turns to AIOps to automate manual effort

Today, Vitality has adopted an AIOps approach to automatically identify and proactively address customer usability issues.

If a customer's effort to redeem a reward fails, Dynatrace not only identifies the precise root cause of the error, but its integration with other applications in the technology stack enables Vitality to automatically send the customer a text, email, or even call to enable the customer to redeem the reward.

This automatic communication generally happens within 2 to 5 minutes of the initial issue, which means this AIOps approach quickly turns a potentially negative customer experience into a positive one. Because Dynatrace helps address customer reward redemption issues automatically, Vitality's teams can address higher-level concerns.

“ We have gone from a lot of manual [work] to a lot of automation.”

Steve Amos, IT Experience Manager, Vitality



The work we're doing with Dynatrace is critical in helping us to deliver brilliant customer experiences.”

David Priestley, Chief Digital Officer, Vitality

AIOps enables shift left

Today, Vitality leverages AIOps to address a host of customer experience problems and tedious, time-consuming customer support issues. Further, Vitality has been able to use its information about system errors to “shift left” — that is, to identify software issues earlier in the development lifecycle. Automatic intelligence from their AIOps solution helps developers customize the content of messages to customers concerning system issues.

Ultimately, Vitality's work with Dynatrace has made it more seamless for customers to pursue healthy lifestyles without friction.

CONCLUSION

The path to a better AIOps strategy



The explosive growth of the artificial intelligence for IT operations (or AIOps) market means organizations need to weigh their options carefully. As you evaluate different offerings, note the following critical factors:



Data fidelity

AIOps tools are only as good as the data they collect. The best AIOps technologies can collect metrics from a wide range of hosts and operating systems. They should also be able to auto-detect the processes that run on them to provide analysis with code-level detail.



Tool standardization

Leading AIOps solutions are those that become the foundation for a unified IT tool set — as opposed to yet another tool for engineers to juggle. Look for AIOps solutions that are extensible enough to integrate with other IT solutions your team uses.



Hybrid cloud support

An AIOps solution should support hybrid-cloud environments, seamlessly spanning dynamic multiclouds and legacy applications and architectures hosted on-premises.



Openness

AIOps technologies that natively support open standards and integrations and provide extensive APIs are the easiest for engineers to embrace. They also tend to be the most extensible.



Continuous insight

AIOps shouldn't tell you what happened after it happened. Look for tools that deliver continuous, real-time insight.

The Dynatrace difference

Go beyond alerts and correlations with Dynatrace's deterministic AIOps platform. By embracing and building on open standards such as OpenTelemetry, Dynatrace provides immediate, actionable identification of root-cause issues. With real-time causation-based analysis, Dynatrace does much more than simply tell your team that something might be wrong. It frees engineers to focus on what really matters — productive, value-creating work, not time-consuming reactive work. In turn, Dynatrace software intelligence helps teams build a culture of collaboration and shared tooling across the IT organization.

Learn more by requesting a [demo of Dynatrace in action](#).



About Dynatrace

[Dynatrace](#) (NYSE: DT) exists to make the world's software work perfectly. Our unified software intelligence platform combines broad and deep observability and continuous runtime application security with the most advanced AIOps to provide answers and intelligent automation from data at enormous scale. This enables innovators to modernize and automate cloud operations, deliver software faster and more securely, and ensure flawless digital experiences. That is why the world's largest organizations trust the Dynatrace® platform to accelerate digital transformation.

Curious to see how you can simplify your cloud and maximize the impact of your digital teams? Let us show you. Sign up for a free [15-day Dynatrace trial](#).