

Shifting to Proactive IT Ops with IBM Cloud Pak for Watson AIOps

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Introduction

Increasingly, corporate management understands that the software that operates their business processes is critical to the integrity of their business. Traditionally, the IT operations organization has relied on the know-how and experience of employees to keep applications and systems performing as expected. However, technology environments are becoming increasingly complex. Therefore, ensuring the always-on performance of on-premises, cloud, and new technologies is a serious challenge for operations teams. Using artificial intelligence (AI), machine learning (ML), and automation is the only way to manage this increasing complexity so that teams can focus on their most important tasks.

In this paper, we will discuss the challenges businesses face, the need for businesses to rethink their approach to IT Operations with AIOps, and how they can use artificial intelligence to support more sophisticated, more robust operations and greater business success. In addition, we will discuss IBM's approach to AIOps, focusing on IBM Cloud Pak for Watson AIOps, which deploys advanced, explainable AI in order to quickly assess, diagnose, and resolve incidents across mission-critical workloads. The platform extends the advanced analytics from existing IBM capabilities with real-time analysis of unstructured data, holistic correlation, and ChatOps (i.e., Slack and Microsoft Teams) integration.

The Challenge of Distributed Hybrid Cloud & the Current Reality of Today's IT Ops

IT operations had once been an art rather than a science. The smartest IT ops professionals relied on their years of experience to understand the way the systems they supported operated, and they applied that understanding to quickly fix problems in well-documented environments.

With the adoption of highly distributed hybrid environments, the stress on the IT operations team has grown more intense. With more distributed data, more platform services, and more networks to control, it is not possible for an IT operations engineer to fully understand and anticipate the complexity of managing and controlling IT in real time, without the support of new technologies.

IT operations teams often have the data needed to spot an emerging outage, a degradation of service, or a changing pattern in customer usage. However, this data is trapped in disparate tools or locked in silos that do not integrate intelligently with other relevant data. IT operations teams need a single source of the truth, spanning the data silos pulled from different tools and resources, as well as rich context on the environment itself. To be successful, an organization requires a foundation that provides solutions as their increasingly complex environment by providing a set of more sophisticated tools. The only way to achieve management of operations in this highly distributed hybrid cloud

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environment is to apply artificial intelligence alongside sophisticated tools. The combination of AI and next generation tools reduces the complexity of the automation process.

Defining AIOps

AIOps represents a set of technologies designed by IT operations teams and aimed at addressing the growing complexity that operators, engineers, and practitioners grapple with daily. AIOps is a platform that uses AI, machine learning, natural language processing, and automation to help operations support distributed data, applications, teams, and customers.

AIOps tools must be designed to learn what an environment's baseline looks like, and then alert the operations teams when disparate data indicate a problem. To gain trust with the operations team, as well as developers and business teams, the solution must reduce false positives, prioritize events based on their impact on the business, and, when possible, offer prescriptive guidance on remedying a problem. AIOps solutions should help elevate the skills of junior analysts in order to give senior personnel more time to focus their energy on strategy and complex problems demanding escalation. For teams and their stakeholders to trust an AI-based solution, it needs to be explainable so that there is transparency provided on recommendations or algorithmic determinations. As IT teams begin to gain trust with their AIOps platform, they can apply a greater amount of automation so that more problems can be remedied automatically.

The most important feature of an AIOps solution is its ability to predict future anomalies or outages before they have an impact on the business. To achieve this proactive stance, the system must rationalize and analyze data across silos. This capability reduces event and alert noise so that practitioners can focus on the most important issues. In addition, grouping signals to form a single view of an incident allows an AIOps platform to provide more useful and prescriptive recommendations in order to address the incident—along with documentation for potential investigations. This cross-silo data analysis allows the solution to help IT operators quickly identify emerging problems within their applications or system, helping to accelerate response times while prioritizing long-term projects to streamline operations.

We envision an operations management environment that has AI and automation built in throughout the entire system, allowing teams to shift left to prevent future problems. In traditional processes, the approach has been a step-by-step progression where each team hands off their work to the next team in the process. On the other hand, a shift-left approach is designed to identify and prevent potential problems as early in the process as possible. When you apply shift-left methodologies to IT operations, the goal is often focused on predicting risks associated with deployment, before an incident occurs and before the application is deployed. A shift-left strategy requires cross-team collaboration along with technology tools that can support the strategy. A platform with AI built into its core is critical—these systems can create models and begin to spot patterns and anomalies that will lead to future problems.

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How a Bank can Leverage IBM Cloud Pak for Watson AIOps to Support Transformation

A major bank that built a successful consumer banking business over decades was challenged to meet customer expectations as the Covid-19 pandemic expanded. The bank needed to drastically accelerate its digital strategy. Customers wanted more than online bill pay and quick account balance updates – they wanted the types of services that born-on-the-web startups are offering. For example, the bank needed to quickly find ways to offer frictionless loan applications and approval letters (without multiple trips to a branch and conversations with loan officers), easy ways to transfer money to friends and family, and new account types for various family members.

The bank needed to move quickly, and the development team did not take the time to properly implement compliance requirements for some business processes. The bank's Chief Technology Officer (CTO) recognized that problems could occur as the technology team was pushed to accelerate new offerings. Because of the risks posed to the business, the bank's CTO evaluated new platforms to help minimize risks and ensure high performance. The IBM Cloud Pak for Watson AIOps platform was adopted to catch this problem during the coding stage via GitSecure analytics. This process prevented code from automatically moving into deployment. By leveraging IBM Cloud Pak for Watson AIOps, the company's developers became able to incorporate compliance requirements into the code during the development phase rather than waiting until deployment—resulting in fewer potential problems and faster release times.

An additional challenge arose during the application deployment phase. A deployment image was built based on a corrupt configuration map. Had this image been used during the deployment phase, customers would not have had access to the service. IBM Cloud Pak for Watson AIOps was able to predict that this deployment image would result in a potential failure, and it prevented the deployment from moving forward until the development team fixed the problem.

Taking advantage of AIOps allowed the bank to move quickly to develop and deploy new innovative applications and services safely and predictably. This shift-left approach enabled the team to work collaboratively to meet customer expectations more quickly, while also releasing high-quality code.

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IBM's Approach to AIOps

IBM Cloud Pak for Watson AIOps enables customers to accelerate incident management, diagnosis, and resolution by using AI, natural language processing, and other advanced technologies. IBM Cloud Pak for Watson



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AIOps address the core functions and capabilities critical to an AIOps solution, particularly in its ability to identify anomalies across data silos. IBM's solution also includes a series of connections to a variety of data sources and techniques to manage AI model training, empowering organizations to understand and refine their AI models.

It's important to remember that adopting an AIOps platform is not a one-time event. Instead, it requires an iterative process that ensures that data and AI/ML models are always up-to-date. This approach can be divided into three steps: Understand, Anticipate, and Automate. Below we will explain how IBM approaches these steps and the business value that is unlocked as you achieve each step along your journey.

Step One: Increase your Understanding

Your operations team gathers data to understand workloads, environment health, and potential failures. Critical to reaching that understanding is a single source of truth, the ability to correlate signals coming from different sources, and the ability to navigate the topology of an IT environment. With these tools, teams can move beyond using pure skill to make decisions and take action, which in turn helps new hires deliver value and skill-up more quickly.

With IBM Cloud Pak for Watson AIOps, you can consolidate and automatically track data from different tools to give your team an accurate and real-time view of your environment. Rather than needing to move between multiple tools to manually bring data together, IBM Cloud Pak for Watson AIOps will bring that data into one resource without spending work-hours collecting data. This capability is critical in the effort to help your operations team shift to a proactive stance. Practitioners can use the information to understand the underlying incident, address the current situation, and improve the system to prevent future incidents.

As your team members increase their understanding of their operations data, the following business results will be achieved:

- The ability to prevent significant errors from being incorporated into code during development and deployment in order to increase uptime and customer satisfaction
- The ability to decrease mean time to detect (MTTD) an incident
- Manual labor will decrease, reducing your mean time to identify (MTTI)
- Faster diagnosis of incidents, which brings down your mean time to know (MTTK)
- Quickly restored services, leading to a lower mean time to repair (MTT)

Common in all of these achievements is that operations teams will have more time to focus on critical tasks in context with the goals of the overall project so that the need for manual processes is reduced. Your teams are no longer searching for information through log data to hunt down the cause of errors. Instead, team members can quickly maintain excellent levels of service.

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Step Two: Anticipate Incidents Before They Occur

Every organization wants to be proactive. However, shifting from a reactionary stance to a proactive one requires a well-architected technology foundation. After reaching the “understand” phase in the AIOps journey, teams can prevent incidents from happening rather than waiting for problems to occur.

Shifting to a proactive stance requires you to bring together results of event, metric, and log data along with other data sources. IBM Cloud Pak for Watson AIOps analyzes all of this cross-silo data and makes connections and inferences based on massive amounts of relevant data. By creating a baseline model according to what your environment looks like when it is operating normally, the system can quickly identify deviations from normal operations. In addition, IBM Cloud Pak for Watson AIOps can help operations teams better anticipate the impact of a disruption. The offering can locate downstream risks and the secondary impacts of an incident. These capabilities help operations teams ensure that workloads are in an “always-on” state and that customers are never disrupted.

Understanding unstructured data is imperative to be able to better understand the context of log data. Unlike most other data sources, log data can act as a leading indicator for potential issues. IBM Cloud Pak for Watson AIOps uses sophisticated log anomaly detection capabilities to learn normal log patterns during training, understand semantic meaning, and detect anomalies in real time.

The following highlights two examples where IBM Cloud Pak for Watson AIOps were able to prevent serious problems from impacting business operations:

- **Proactive Alerting.** An IBM Cloud Pak for Watson AIOps customer used the platform to monitor a database-as-a-service offering. Once implemented, the client found that the IBM Cloud Pak for Watson AIOps platform could help discover irregularities nearly 50 minutes before an incident occurred. Alerts sent to a Slack group accelerated triage and response time.
- **Anomaly Detection.** An IT operations team found that traditional methods like keyword searches could not surface any meaningful errors from unstructured data. When the organization adopted IBM Cloud Pak for Watson AIOps, the team was able to quickly find and localize new anomalies within the large, unstructured data set. As a result, IT operations could more easily address long-standing issues while improving service levels, incident responses, and, ultimately, customer satisfaction.

Step Three: Automate Wherever Possible

Few operations teams are actually able to automate automation processes at scale. Organizations usually start focus their automation process by pragmatically focusing on common, time consuming, and well-understood issues that are prone to human error. For more severe incidents, an AIOps platform offers an increase level of sophistication that leads to identifying and matching the patterns in anomalous data to previous events and recommend resolution strategies.

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IBM Cloud Pak for Watson AIOps helps organizations bring together development efforts with security and operations (known as DevSecOps). Rather than keeping development, operations, and security separate, DevSecOps combines all of these efforts into a single practice. DevSecOps requires a change in culture by breaking down traditional silos between teams. To be successful, these teams must be supported by technologies based on a DevSecOps methodology.

DevSecOps helps to prevent outages and supports a shift-left strategy. To support DevOps, engineering teams, security engineers, and site reliability engineers (SREs), IBM Cloud Pak for Watson AIOps provides all of these teams with a unified goal of incidence resolution and outage avoidance processes. The end result is a solution that enables IT Operations and SREs to serve as gatekeepers to assure that any code releases are of the highest quality and free from defects. By providing feedback throughout the software delivery lifecycle, IT leadership can ensure that applications support business goals.

Conclusion

By applying AI to IT operations, IT teams are able to manage the complexity of highly distributed computing environments that cannot be achieved through manual processes. Skilled employees are needed to analyze data in context with changing situations and exploding data sets. By leveraging machine learning processes and models, your skilled teams can focus on understanding customer change and supporting their needs. IT operations teams have to be armed with the most sophisticated solutions in order to support all the myriad of distributed data and applications in a consistent and predictable manner, your business can create a predictable and trustworthy customer environment.

IBM Cloud Pak for Watson AIOps provides a platform based on identifying patterns and anomalies that will increasingly challenge your IT teams to keep your distributed environment operating in a way that customers and partners expect and demand. The IBM platform is designed to apply AI and ML technology across all operations data, to help teams spot problems before these ever create a customer disruption. The platform helps companies quickly release updates and new services safely and predictably.

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