Summary Insights: AIOps Truths and Best Practices

RFG Perspective: The primary objective of AIOps is to improve systems availability and IT operations productivity by automating corrective actions through predictive analysis, root cause analysis and synthesis of data. AIOps enhances traditional IT operations tools by adding machine learning (ML) and analytics automation to simplify and address the IT operational complexities of the New Normal environment. That includes the full range of operational environments, including hybrid cloud, multi-cloud, CI/CD pipelines for DevOps, containerized applications, Edge computing, and IoT (Internet of Things). Although AIOps has not yet reached maturity, there are enough functional advancements for IT executives to be aware of it and potentially pilot AIOps projects to determine which solutions might be desirable to implement in some, or all, of their production and dev/test environments.

INTRODUCTION

One constant that has not changed over the decades is that IT operations remains challenged to keep systems highly available with a minimum staffing and at a reasonable cost.

In the wake of COVID-19, many companies are still struggling with achieving high reliability in ongoing IT operations. They are still being challenged to keep their systems highly available with a minimum staffing – and at a reasonable cost. The average cost of critical IT incidents per month, per organization, is typically in the $1.2 Million range. Today, many IT operations executives are planning to leverage AIOps to reduce the number and duration of incidents, and to reduce the level of staffing required to keeps systems running and available.

This report discusses a snapshot of customers' use of AIOps technology, as well as describing the current value proposition, disclosing what the best practices are, and sharing the lessons learned by top IT executives to enable short- and long-term benefits in IT operations.

AIOps: What Is It?

AIOps relies on a continuous flow of data inputs to operate effectively, including elements from event data, time-series data, and log files. Necessary variables include parameter and performant intelligence including configuration, topology, business-impact data, and even asset-related and cost-related data.

In all, there are five categories of AIOps, each of them needing its own inputs and presenting its own challenges:

- Incident management – also known as event management
- Performance management

- Availability management
- Capacity management
- Change management

Let's look at each of these, in turn:

Incident management (a.k.a. event management) addresses the onslaught of alerts faced by many IT operations employees. Usually, the problem is too many alerts, rather than too few. Applying artificial intelligence (AI) can help to parse the incoming alerts – making it easier to identify the most urgent ones for remediation. In many cases, AIOps may be able to perform the remediation without human interaction.

Performance management allows customers to anticipate trends and to prioritize the use of their systems resources. It supports automation of repetitive tasks, and self-service capabilities that save staff time.

Availability management gives organization a dashboard of monitoring results that make it easier to identify potential sources of outages – and to address them in the background, before any outage occurs.

Capacity management is done very differently in a world that has AIOps. Traditional capacity planning anticipated computer, memory and storage usage patterns – allowing IT professionals to adjust deployments to be able to scale more smoothly. In a DevOps environment with continuous delivery (CI/CD), capacity management is no longer sufficient to meet the unpredictable demands of web-based traffic. AIOps gives IT shops a new set of tools to anticipate, control and manage the way resources are consumed in a virtualized world of containers and IoT sensors, where unexpected demand for scale-up capacity may develop suddenly.

Change management: IT change management is an ITSM process that rolls out change requests to an organization's IT infrastructure. In a virtual world, VMs and containers are widely adopted – and change in infrastructure is more likely to come from a software command than from a forklift upgrade. That's why adopting processes that confirm with ITIL standards will help customers make the transition from physical infrastructure to software-defined infrastructure and to cloud platforms that span their geographically distributed hybrid cloud environment. Adding automation to this AIOps-infused environment speeds end-to-end deployments and management of enterprise workloads.

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RFG 100 Panelists and Insights from Participating RFG 100 Executives

On Nov. 12, 2020, RFG facilitated an RFG100 video conference entitled *"AIOps Desired Outcomes, Truths and Best Practices."*
The panelists on the call were:

- Praveen Gopu, Senior Director, Equitable
- Dror Mann, Director, ServiceNow
- Erik Rudin, VP, ScienceLogic
- Ruchir Puri, IBM Fellow Chief Scientist, IBM Research

These RFG100 executives and panelists discussed the current state of AIOps – desired outcomes, truths and best practices.

In this research report, we include their reflections on the challenges they faced – and the acceleration they experienced when applying AIOps automation to their organization's IT processes.

RFG Analysis

Prior to the COVID-19 pandemic and work-from-home (WFH) lockdowns, AIOps projects were aimed at addressing customer-facing systems – if funding for AIOps could be justified at all.

However, in the COVID-19 era, New Normal environment budgets are being allocated for AIOps. The aim of these projects is to improve the availability and health of the internal IT platforms, making it easier for remote employees to work from home.

The objective of AIOps projects is to keep systems available – and to improve root-cause analysis, thereby reducing the mean time to recovery (MMTR). AIOps is also being tied to workflow automation, so that it can trigger faster workload-recovery actions.

At this crucial point-in-time, business and IT executives need to understand that AIOps technology is still maturing – and that much of the hype does not yet equal reality. But the efficiency it brings to IT operations is truly impactful. AIOps can address 70 percent to 80 percent of operational issues without human intervention, greatly reducing IT staff time toward resolution of the remaining issues. The evidence is plain to see: Executives can measure AIOps success through a number of metrics, such as MTTR (mean timer to recovery) metrics, resource utilization metrics, Net Promoter Score (NPS) – which is a customer loyalty and satisfaction metric – and, in many cases, improvement in quarterly revenue.

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POLL RESULTS

RFG100 executives were polled about their usage of AIOps software, which turned up the following results:

- Fully 50% of respondents have implemented AIOps or had it in development or test phases of deployment. Another 25% had plans for AIOps in 2021, while the rest of the respondents reported that they had no plans for AIOps in calendar year 2021.
- The most common uses of AIOps were, as follows: incident management (68%); performance management (50%); Availability management (36%) and capacity management (32 %). In this poll, change management was mentioned by just 14% of the respondents.
- Looking at expected benefits for AIOps use, the results were decidedly mixed.
- While 37% of respondents said that their AIOps efforts met or exceeded expectations, a larger number – 45% did not report major benefits, saying AIOps did not meet their expectations, while nearly 20% (18%) said they believed it was an over-hyped technology in calendar 2020.

ANALYSIS

AIOps maturity model

While a significant amount of progress has been made in AIOps software, the self-healing components for many categories within AIOps are not yet in place.

Of the five categories of AIOps (as listed above), it is event management (incident management) that has progressed the most, RFG100 executives reported. In events management, AIOps software can reduce hands-on incident responses by 70% or more – a significant savings in time and money.

Other flavors of AIOps tools for performance management, availability management, capacity management and change management need to further enhancements to be adopted and installed more widely, RFG100 executives said.

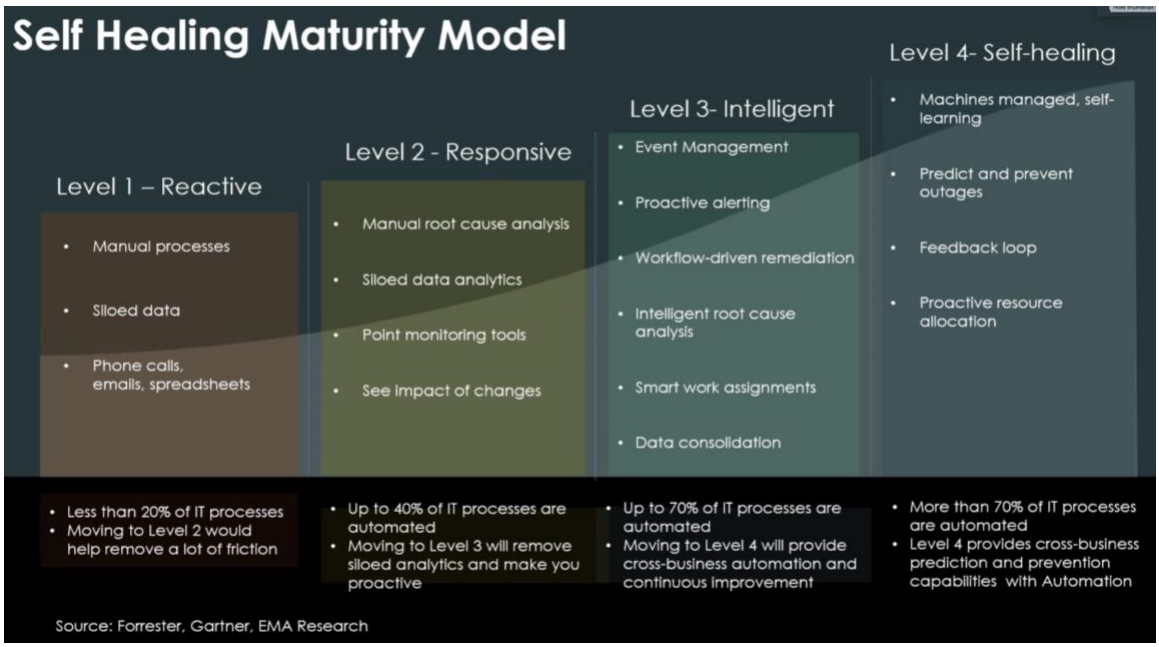
Chart 1 (below) illustrates the four phases of the Self-Healing maturity model: Reactive, Responsive, Intelligent and Self-Healing.

The **Reactive** mode, shown as Level 1 in the chart, is the starting point and one that requires the most attention from IT staff: It involves many manual processes and data must be entered into separate management tools.

The **Responsive** mode, shown as Level 2, applies data analytics and the input of monitoring tools to improve operations. However, it does not spare IT staff of the need to view the data inputs from multiple monitoring software products. This is just the first step in automating IT operations, improving efficiency in addressing the organization's IT operations issues.

The **Intelligent** mode, shown as Level 3, applies proactive alerting and intelligent root-cause analysis, to support IT operations staff. This improves efficiency, and reduces IT operations costs overall, including the resolution of pending problems, including temporary outages, or data being accessed across many data-silos.

Finally, the **Self-Healing** mode, shown as Level 4 in the model, is the result of applying advanced IT operations software to the tasks of monitoring and managing IT operations. This mode leverages self-learning systems, automated prevention software that predicts future outages, and improved resource allocation in a real-time IT operations department,



Overall, we can see that the potential of AIOps is far greater than the early findings would indicate. AIOps can be utilized in multiple siloed areas such as deployment, configuration, ticketing, data, logging, data, learning, data, and typology metrics. However, we should note that AIOps is most effective when it can be used to break down the silo boundaries and provide management across clouds and legacy environments. In that scenario, AIOps tools provide management across clouds and legacy environments and examine cross-boundary elements such as alerts, logging data, ticketing data, and unstructured data.

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Future Use Cases for AIOps

AIOps tools become even more interesting and effective when we look at the way that AIOps can correlate seemingly separate events. For example, AIOps can be used in the DevSecOps pipeline – especially in cases when it is viewed as being applications-centric rather than operations-centric.

In those scenarios, AIOps has the potential to shift its usage from a reactive mode to a predictive and proactive mode. If widely adopted for those purposes, AIOps could potentially eliminate outages and it could drastically cut support resources.

Interestingly, this is the scenario in which site reliability engineering (SRE) comes into play and becomes powerful. The SRE discipline incorporates AIOps and aspects of software engineering – and then applies them to infrastructure and operations problems, creating highly scalable and highly reliable software systems.

Cultural Challenges Facing AIOps

Customers' adoption of AIOps is slowed by traditional cultural challenges. People are experiencing a knowledge-based journey when leveraging their organization's data and its interactions between datasets.

Driven by the enterprise's high priority needs for compliance and security, the greatest headwinds to AIOps adoption are coming from organizational resistance to change. Users want the "AI" in AIOps to automatically do everything for them, including discovering, cleaning and managing their data. However, if the data is not yet "ready" or "clean enough" for AIOps, business outcomes will fall shorty of expectations. This state-of-affairs leads many IT executives to defer any AIOps actions until they can be convinced that AIOps tools have attained greater maturity.

Training is another cultural issue to be overcome. One does not just install AIOps tools and expect them to deliver greater efficiency. People must "train" the AIOps models to get the best results out of deploying them. Human factors play a big role here: Not only does the AI/ML model have to provide the information desired, but IT staffers need to know what to do once they see an alert.

Identifying which "roles" and job titles must buy into an AIOps solution, is a key factor for success. Who should be trained to use AIOps? Should they be on the IT staff or should they be business stakeholders? Would they know how to react to a proactive alert or a reactive alert? Would they recognize false positives? And who is will approve the adoption of AIOps for their production or dev/test workloads?

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One final challenge is that many firms lack well-documented formal procedures that can be incorporated into an AIOps model. A first step, then is to take the time to document their AIOps expectations and the expected outcomes for each type of AIOps deployment scenario. One way to reduce "cultural" issues is to take a workshop approach to AIOps education. That way, the AIOps data scientists can sit down with their IT counterparts to determine what data will go into the AIOps model – and what business outcomes should be expected.

Cleaning Up the Data

An important pre-requisite for an AIOps project is having "clean" data that is accurate, current and relevant. *[See the report "RFG100 Summary Insights on Data Acquisition and Cleansing", October, 2020]*

For some customers, the key to addressing this challenge is getting accurate data in real time while reducing the number of touch points and then driving automated processes around it. The focus should be on producing right usable outcomes – not on the state of the technology.

AIOps solutions work best when they can predict when a system has entered a "stress" state and then proactively move data from one system to another system – thus avoiding a failure. The value of the AIOps software would be greatly reduced if human intervention were required to avoid a systems failure, because any pause for human intervention stops the entire real-time orchestration engine.

However, to train the system initially, humans must be in the loop. One needs the operations staff to ensure that the correct actionable information is present to predict the problem – and to proactively respond to it. One challenge is having a good CMDB (Configuration Management Database). Importantly, to work well, it must be a CMDB that is current and that does not get stale over time. The problem most enterprises have is that they do not know whether the content in their CMDB is accurate, current and relevant – and all of these qualities are essential to smooth operations.

AIOps Metrics

Two common metrics used to measure the effectiveness of AIOps are MTTR (mean time to recovery, and the NPS (net promotion score, which is based on average scores for customer satisfaction based on survey scores).

The RFG100 panelists believe that the MTTR metric will disappear over time, especially as more predictive and more proactive features become available. Executives need to ask the users and application staff about which key performance

indicators (KPIs) one can get from the data – provided that you have the right data set. Otherwise, the incoming data is devoted to alert correlation, rather than but the advanced analysis that enables proactive business actions.

Financial risk is one of the key KPIs that can be used for this purpose. Another KPI is security risk, because touching these applications has the potential to cause some types of outage issues. Overall, we can take away customers' understanding that AIOps software eliminates a number of human interactions, thereby reducing the probability for outages.

SUMMARY

AIOps uses automation and machine learning (ML) to extend IT organization's capabilities to effectively and efficiently enhance IT operations to achieve high reliability for enterprise workloads. RFG100 executives note that the most advanced aspect of AIOps today is event (incident) management. But AIOps tools in other areas, such as performance management, availability management, capacity management, and change management will likely become even more powerful by 2025. Taken together, the full spectrum of AIOps tools is expected to mature, making them more effective in managing cloud-enabled enterprise workloads.

RFG POV: AIOps is on its way to becoming an essential technology for hybrid cloud and multi-cloud environments, due to its ability to automate management of IT operations. Given the expansiveness of hybrid clouds, the sheer amount of management tasks can get ahead of available IT staff resources. Clearly, AIOps functionality must be improved before it can be applied, evenly, across all types of IT operations management tasks. But just as clearly, it is just a matter of time before AIOps tools become more capable across management disciplines. They must be applied – starting now – to ensure highly reliable enterprise workloads by mid-decade. IT executives must pay close attention to AIOps – and its growing capabilities and maturity. It's likely to become a core element of many enterprise IT operations in the next three to five years. That is why IT executives should start evaluating and piloting current AIOps tools now to see how they can improve uptime while reducing their organization's operational costs.

Additional relevant research and consulting services are available. Interested readers should contact Client Services to arrange further discussion or interview with Mr. Cal Braunstein, CEO and Executive Director of Research. Jean S. Bozman, President of Cloud Architects Advisors LLC, co-authored this report.

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