USING AIOPS TO GAIN OBSERVABILITY AND INSIGHT

A Global Survey of Executives and IT Professionals

November
2020

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Introduction

This paper reviews a global research survey focusing on observability for today's complex IT environments and the use of automation and artificial intelligence. A total of 321 participants directly involved with IT system operation and strategy completed the survey about their company's IT monitoring approach as well as the adoption of Artificial Intelligence in IT Operations (AIOps) and Intelligent Automation. Individuals surveyed were responsible for IT systems, monitoring, and strategic roadmaps, including front-line to executive roles.

The research additionally interviewed 5 users of Broadcom's AIOps solutions that provide visibility, analytics, dashboarding and automation. The qualitative focus was to gain real-world perspectives on the observability and operational problems they were trying to solve, and real benefits delivered by those solutions.

Executive Summary

This report finds that nearly every company indicated that achieving end-to-end observability for modern applications and IT environments is challenging, citing hybrid applications, 3rd party cloud infrastructure and mobile applications as key contributors. To combat this lack of visibility, companies historically have employed numerous monitoring tools, with more than half using a half a dozen or more tools and generating a tremendous volume of data. More than 9 out of 10 participants shared they need analytics tools just to process all the incoming information.

Artificial Intelligence for IT Operations (AIOps) is a sophisticated approach, using machine learning algorithms and data science to establish proactive, automated remediation capabilities which 93% of companies stated they need to utilize the voluminous monitoring data created by their modern applications and complex environments. Companies expect numerous benefits from AIOps, such as faster issue resolution, automatic anomaly recognition, increased uptime, and pinpointing root causes. Participants strongly believe the AIOps will provide both development and operations teams a solution to facilitate fact-based discussion. AIOps can also predict pending application release quality and corresponding customer experience impact. These benefits are driving 83% of the companies surveyed to implement AIOps with 25% already in deployment. A large majority of participants indicated their company is adopting intelligent automation as a way to improve application management and operations with more than a quarter of them having already started.

Most companies (68%) surveyed plan to adopt Site Reliability Engineering (SRE) to augment the operations practice with software development skills needed to support the adoption of sophisticated automation and AI. The technologies of AIOps and Intelligent Automation are enabling end-to-end visibility and control while also providing a catalyst for IT teams and developers to work better to together in a collaborative fashion, not just on issue resolution but proactively to build better software and IT systems.

Key Findings

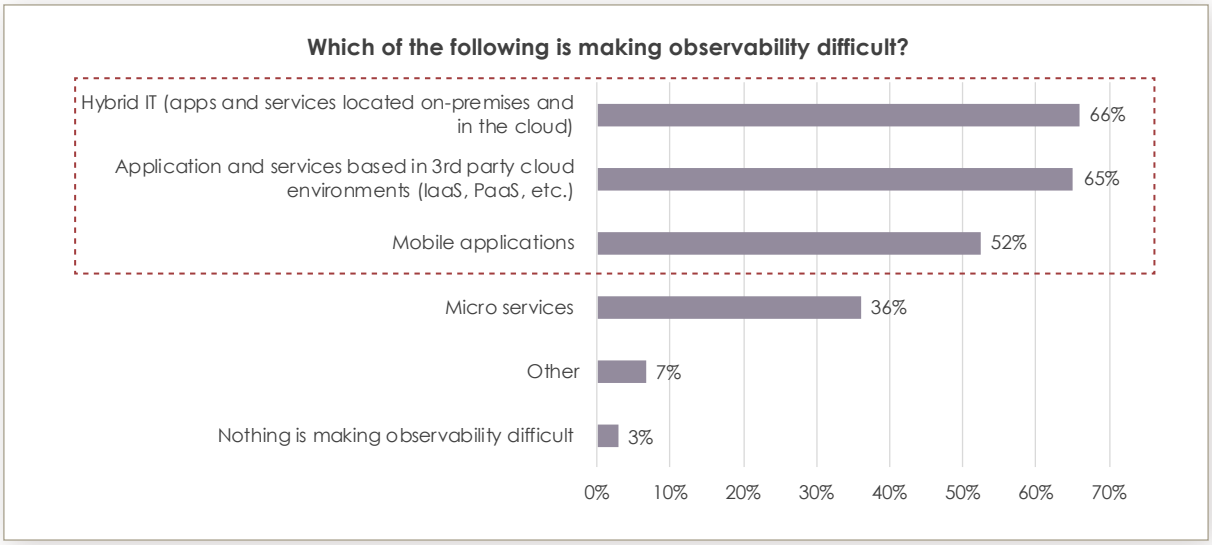
- **Observability of Modern IT Environments is Increasingly Difficult**
  - More than 50% of companies indicate cloud and mobile devices makes observability challenging
  - More than half of companies are using 6 or more monitoring tools
  - 94% state analytics solutions are needed for correlating monitoring information but only 46% have tools today
- **AIOps Delivers Solutions to Managing Modern Complex IT Environments**
  - 93% stated AIOps can improve the management of complex IT applications and architectures
  - 99% of companies expect numerous benefits from AIOps adoption
  - 90% of companies want a solution that predicts the customer experience impact of an application release
- **IT Operations and Philosophy are Evolving**
  - 83% plan on implementing AIOps with 25% already starting deployments
  - 80% of companies plan on adopting Intelligent Automation and 26% have already started
  - 68% of company are adopting an SRE approach

Detailed Findings

Losing the War on Observability

IT environment observability has been a top challenge for years. The challenge of gaining visibility has always been a combination of disparate technologies including applications, servers, operating systems, databases, and more. Just as monitoring technologies developed visibility into a piece of software or hardware, new technologies were being released and adopted perpetuating the gap in system visibility. This research shows that this trend continues as more than half of all companies point to cloud utilization and mobile devices as top challenges in observability.

> **"This is a game where the goal posts are constantly moving. It is frustrating, and at times you are just resigned to the fact you could never win."**
>
> *- Deputy Director of Infrastructure and Tools, Global Automotive Manufacturer*

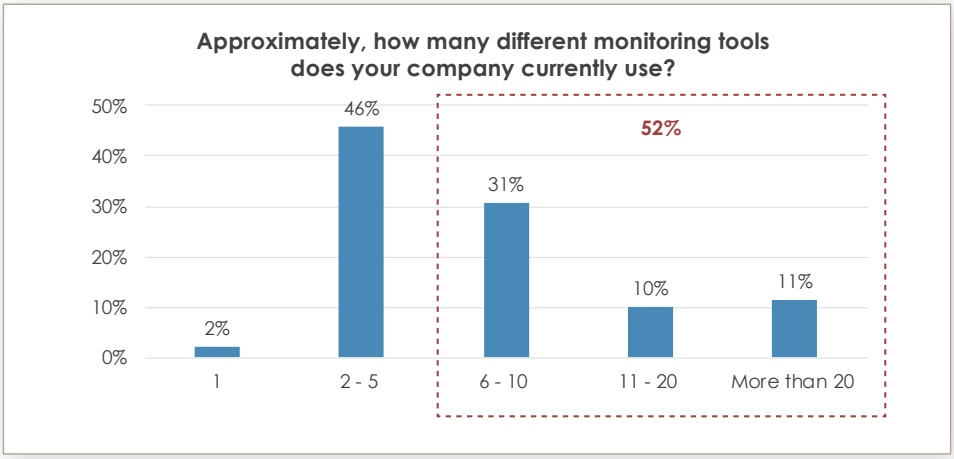


Broadcom's users confirmed this trend citing they were constantly increasing the visibility within the IT environment; with a goal of full end-to-end observability. While new technologies like cloud and mobile devices create new visibility challenges, it is compounded by associated compliance requirements.

> **"Full visibility is at the top of every CTO or CIO objective list. It determines security, operational efficiency, capacity, agility, and fuels the strategy. Without it every strategy is flawed due to a lack of information."**
>
> *- Monitoring and APM Director of Services, National IT Services Company*

Multiple Monitoring Tool Adoption Spirals

This constant fight to establish visibility across the IT environment has often required point tools, or silo-centric solutions. It is not surprising that more than half (52%) of the companies surveyed are using 6 or more tools, with over 1 in 10 companies relying on 20 or more tools. Only 2% indicated that they are only using one solution today.



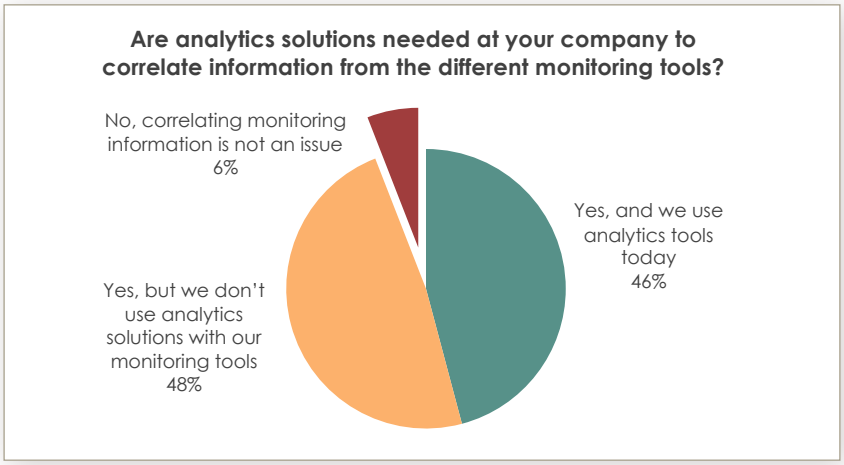
Of Broadcom's users, all were using 20 or more tools prior to their selection of AIOps from Broadcom. Some were using very silo-centric tools for just a single device or application. One participant cataloged all the monitoring tools and discovered nearly 100 monitor tools were in active use. All of the users cited that this was a compelling factor in selecting Broadcom's AIOps solution to progress to far fewer tools and the possibility of just one.

> **"We had a nearly 100 monitoring tools across all the teams - some just to get a few metrics from a storage array or database. They provided useful information, but often just one or a couple team members knew about it. So that information became siloed and essentially lost. This is what makes solving difficult issues hard."**
>
> *- Principal Engineer, International Telecommunications Company*

Information Overload

Numerous monitoring tools used also creates additional costs with each tool's licensing and support fees. Different tools often require additional training and experience to operate them and contribute to the siloed information. Another key disadvantage to numerous tools is the amount of disaggregated data they generate. This research exposes the fact that 94% of companies stated they need analytic solutions to correlate all the information generated, but only 46% actually use analytics today. Analytics as well as AI is needed to process this volume of information and make it actionable.

> **"Too much information but not enough of the right kind or the right context. We had the pieces but not the picture. That's hard to explain to the business when we had an unplanned outage."**
>
> *- Senior Systems Engineer- IS Operations, National University*



Three of the users interviewed had used analytics tools to pull monitoring and log information together to create a homemade dashboard. But they reported that information flowing into the dashboard was a subset of information available, often focusing on an application and not the infrastructure supporting it. However, all 5 users are now using AIOps from Broadcom to collect and report monitoring data across infrastructure, applications, and users to provide system observability.

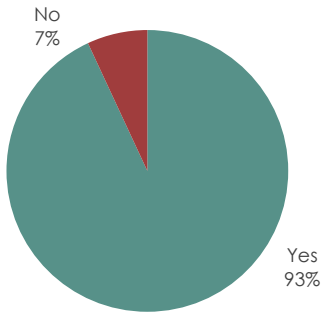
> **"Before it was too hard, too many different connectors to build and maintain, data in different formats, and hard to organize. We are now using [AIOps from Broadcom] to pull it all together on our path to that magical single pane of glass."**
>
> *- Enterprise Architect, Global Technology Company*

AIOps Needed for Today's Complex IT Environments

Taking action today is often based on reaction to up/down monitoring and alarms. In todays' complex IT environments simply knowing something is down is not often enough to fully determine the cause. The information needed is end-to-end visibility and the history to determine why it failed. 93% of IT professionals surveyed indicated that AIOps is needed improve reliability, provide end to end observability, and enable automation. AIOps is the application of machine learning algorithms and data science to establish proactive, automated remediation capabilities. IT teams have been adopting automation for years but these findings indicate automation should also leverage monitoring data to deliver the needed reliability.

> **"Look, we have thousands of metrics flowing in real-time. We need something to look at those to determine if some are trending in the wrong direction. Is this just an isolated issue or will it cascade to an outage? The old disk is 95% full alarm that just won't cut it anymore."**
>
> *- Principal Engineer, International Telecommunications Company*

In your opinion could AIOps help mitigate observability, reliability and automation challenges for complex modern IT application and architectures?

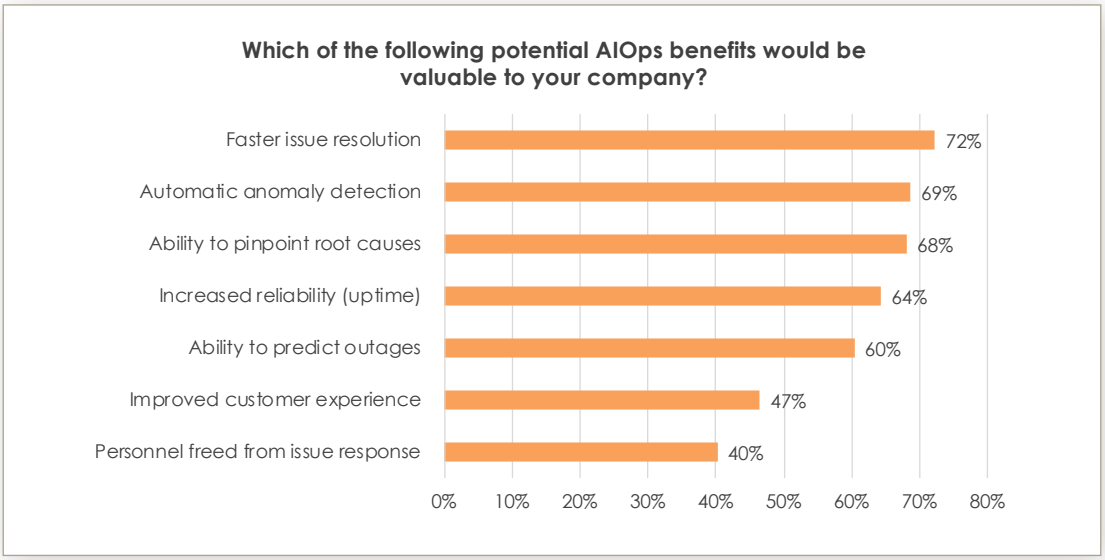


The users of Broadcom's solutions acknowledged that today's IT environments are incredibly complicated and it is difficult to always find and understand the cause and effect of settings or changes. This leads most teams to be reactive and, when they find the cause, try to set an alert to prevent the next time. But, they admit, this creates a bad pattern that fails to create prevention. They shared that observability and AI is the key, not only to providing some automated response but to starting the ability to predict future problems and become proactive in order to reduce unplanned outages.

AIOps Delivers IT and Business Benefits

99% of IT pros stated AIOps could deliver numerous benefits to their company, with fast issue resolution (72%) topping the list. In the third position was the ability to pinpoint root causes of issues (68%). Thus, a key value is using end to end observability with analytics and AI is to derive the problem's source and enable faster remediation. The 2nd most selected benefit was automatic anomaly detection (69%) and as previously discussed, this has the AI looking for and learning operational patterns. These capabilities enable AIOps the ability to predict outages (60%), generating more uptime (64%). Improved uptime and faster issue resolution all contribute to an improved customer experience (47%).

> **"The AIOps products are not reducing work for the IT team, but it is changing it. They are focusing on harder intermittent issues or setting more threshold alerts and working the solution to learn more sophisticated responses."**
>
> *- Deputy Director of Infrastructure and Tools, Global Automotive Manufacturer*



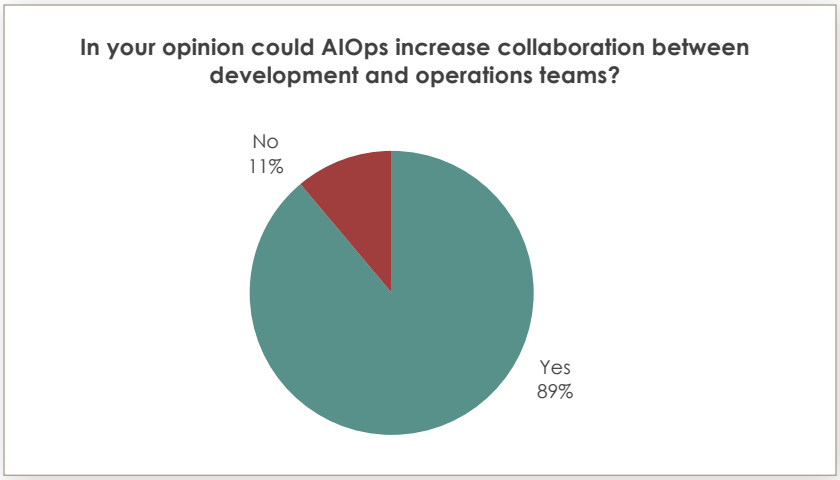
All users have Broadcom's AIOps solutions in varying phases of deployments and confirm that they were not only hoping for these same benefits but already receiving them. The most common benefits cited were improved issue location and faster resolution from increased visibility at each component, as well as the end to end view in the dashboard. Those with DX Operational Intelligence deployed indicated the AI was selecting and executing runbooks, freeing staff from mundane search and fix tasks. All of this has led to uptime improvements, generating better experiences for both internal and external customers.

> **"Right now every time an alarm is triggered a ticket is automatically generated and sent to the right team with links to event logs and relevant dashboards. There are often automated actions recommend by the AI included in the ticket. A team member can choose to authorize the automated action or resolve it manually. This is just so much better and seems so obvious that this is how IT should be run."**
>
> *- Enterprise Architect, Global Technology Company*

AIOps Fostering Teamwork and Collaboration

While AIOps can deliver strong value to the operational, observability aspect of IT, perhaps one of the unexpected findings was that 89% of those surveyed stated that AIOps would increase collaboration between development and operations teams. This stems from moving from silo-based tools to the ability to look at all the information across the IT environment, including software and hardware. AIOps provides the platform to have a consistent end-to-end view and facilitate fact-based conversations.

> **"The hardest part of technology is fighting and changing the culture. It was a siloed mentality of 'it's not our fault, it's somebody else's'. We decided that for everyone in IT, their main dashboard was the end-to-end view and not just their stuff. This has had a very positive effect reinforcing that all of it is our system and our responsibility. This has helped everyone realized it is rarely just a device, piece of code, or network problem. It's like the DevOps philosophy but even bigger."**
>
> *- Principal Engineer, International Telecommunications Company*

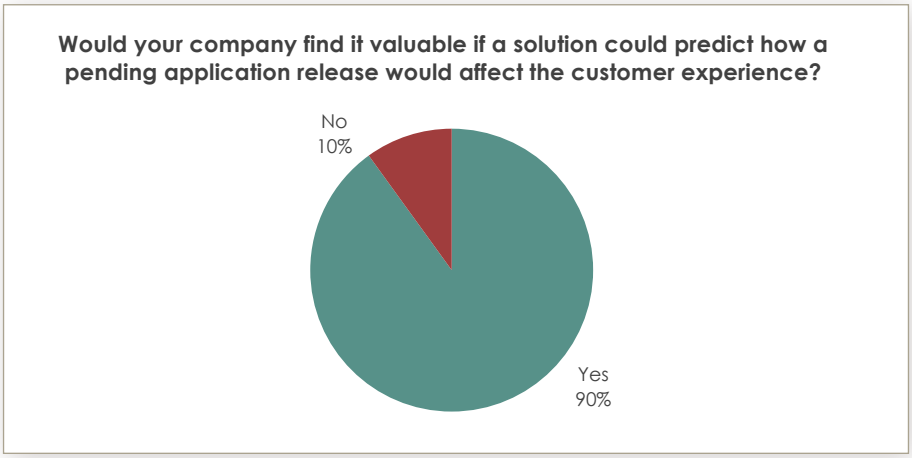


Users of Broadcom's AIOps solution confirmed that having better observability is improving communication and problem solving. While teams often watch and look at dashboards for their area of responsibility, when they can see if other parts of the system are affected it fosters a better understanding of the nature and magnitude of the problem.

Ensuring A Positive User Experience

90% of the participants shared that a solution that could indicate how a pending application release would affect the customer experience was valuable. Per the previous findings, if AIOps could understand performance metrics and system hysteresis, incorporate new code quality metrics, and reference current releases service levels, then a sophisticated AIOps solution could indicate the impact of new application releases. This could provide fact-based go/no-go release decision making.

> **"Really customer perception is everything. If AIOps could reasonably predict that a new release would create more problems, that could really help in decision making. Sometimes we have a gut feeling, but that isn't enough to stop a new rollout that business really wants. Some objective indicators could move our operations and decision making to the next level."**
>
> *- Monitoring and APM Director of Services, National IT Services Company*

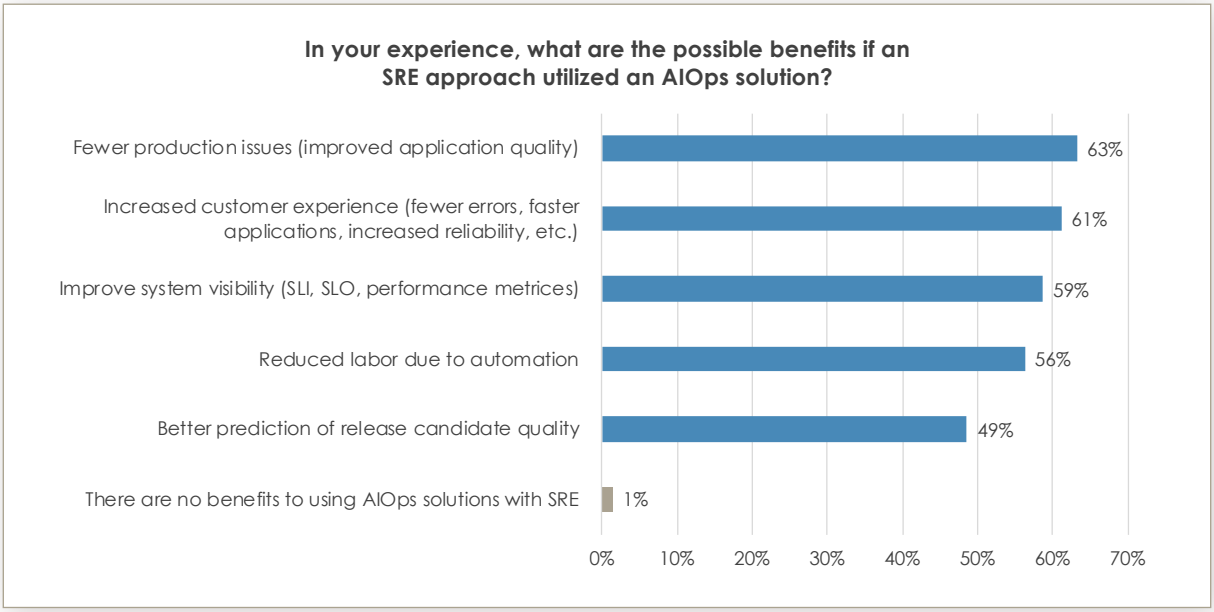


Users concurred that understanding how an application release would affect a customer is highly valuable. They commented this is true for both internal and external customers. Today IT looks at hardware additions as always improving the system. But software releases use the quantity and severity of bugs to determine release readiness, often neglecting how the defects impact the rest of the system: hardware, software, services, compliance, etc.

SRE and AIOps are Synergistic

Many companies are implementing or considering a site reliability engineering (SRE) approach. When participants were asked about the benefits of utilizing AIOps with an SRE philosophy, 99% indicated there are strong benefits, with the top four being separated by just a few percentage points. The most frequently expected benefit was fewer production issues from improved application quality (63%). As indicated previously, the applications were expected to be more reliable and responsive yielding improved customer experience (61%). They also included improved overall system observability (59%) and reduced IT tasks through automation (56%). Further supporting the preceding section, it was also anticipated that release candidate quality can be better understood and thus predict the customer experience impact (49%).

> **"The move to SRE is really a bridging and transformation strategy. The sophistication and approach to automation in a complex environment really needs the discipline and practices utilized in software development. It needs to be methodical and nearly perfect. SRE allows us to merge that skillset with the experience of our operations team. That bridge is what will help us take full advantage of AIOps and Broadcom solutions."**
>
> *- Enterprise Architect, Global Technology Company*

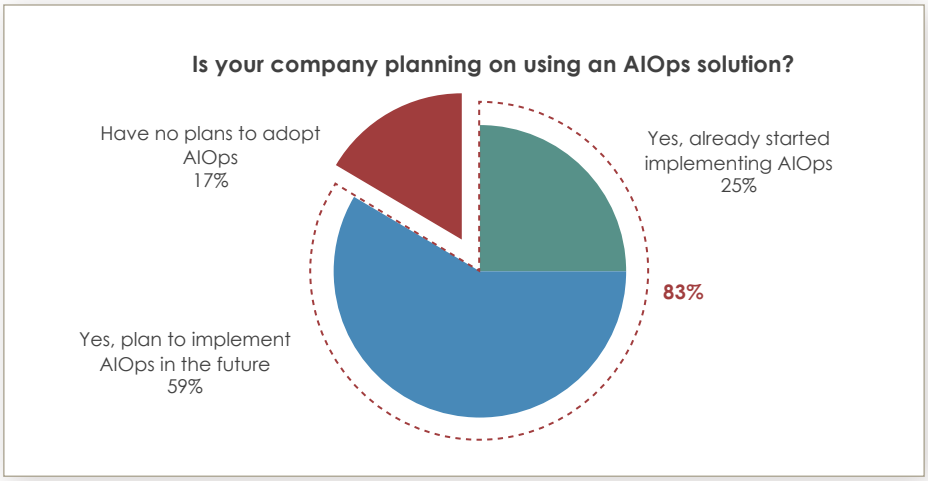


Two of the users of Broadcom's solutions indicated they are adopting an SRE approach. They indicated the adoption of automation into operations, along with virtualization, necessitated the move to look at operations a new way. They immediately identified the same benefits the survey respondents selected when combining SRE and an AIOps solution.

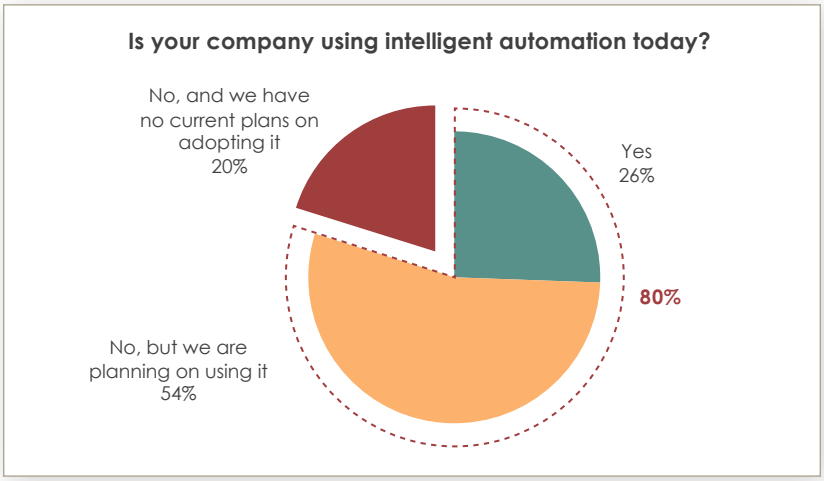
AIOps, Intelligent Automation and SRE are the RoadMap for IT

This report's findings of strong business and IT benefits from AIOps has translated into 83% of the companies involved in this survey planning adoption of AIOps. In fact, 25% of those surveyed have already started their implementation.

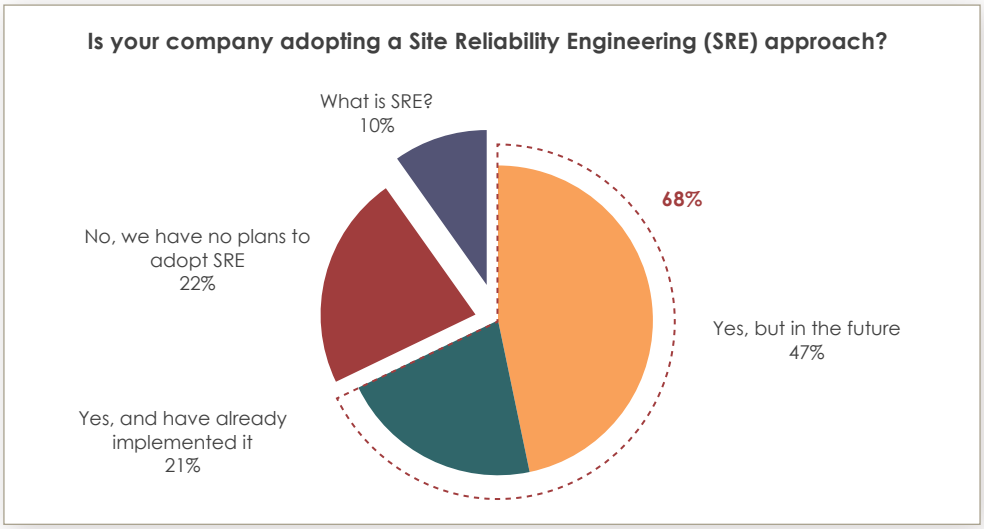
"Honestly it is a lot of work, and will take another year to get fully deployed, configured, and instrumented. But it is magnitudes better then where I started and I would never go back to dumb, tactical, isolated, siloed monitoring tools. If I had the choice to make again, it would make the same, just earlier."



Participants were also asked about their companies' consideration of "intelligent automation," defined as the capability to automatically detect performance, reliability, or operational issues with an application and its environment, as well as provide remediation recommendations based on artificial intelligence (AI) and machine learning (ML) and, if desired, automatically implement fixes. 80% of companies indicated intelligent automation is part of their technology roadmap with more than a quarter (26%) already starting.



Besides just adopting new technologies, a majority (68%) of those surveyed indicated their company is also changing the IT operations culture and philosophy by adopting an SRE methodology. This can provide a platform for creating and delivering increased quality applications into production, combined with the visibility and automation to adapt and maintain it.



All 5 users interviewed strongly subscribed to the vision and value of AIOps. Regardless of their implementation level, all participants reported strong value and would again select Broadcom's AIOps solutions if given the choice.

Conclusion

This research finds that companies have been historically failing to achieve the visibility needed into highly complex IT environments and architectures. Constantly evolving technology has made this extremely difficult and resulted in most companies relying on numerous monitoring tools that are often siloed. Users of AIOps from Broadcom report they are now able to achieve full observability. These solutions are also enabling intelligent automation from automated ticketing, predicting performance issue and outages, to automated remediation. These tools also provide the opportunity for an improved team approach with end-to-end system visibility to enable collaborative cross team issue resolution.

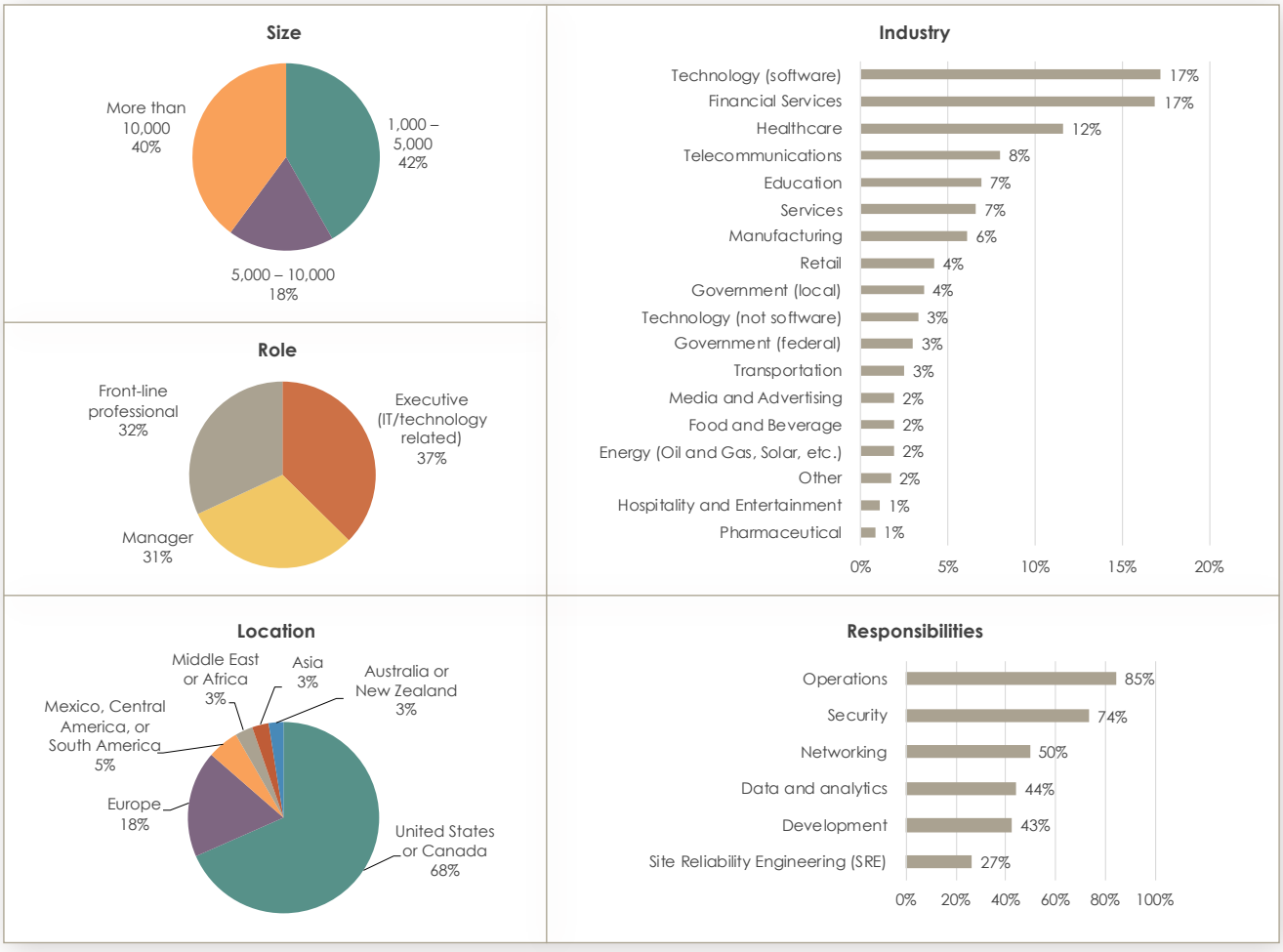
This is not technology for technology's sake. Those adopting AIOps, Intelligent Automation, and SRE are expecting strong business benefits, faster issue resolution, increased reliability, reduced outages, improved customer experience, personnel moved from mundane task to higher value work, automatic anomaly detection, ability to pinpoint root causes, and the ability to predict outages. Users of Broadcom's tools report receiving these benefits as a factor of implementation, culture, and process maturity.

Survey Methodology

IT professionals at enterprise companies representing all seniority levels were invited to participate in a survey on their company's IT monitoring, observability, and plans for AI driven tools for deployment and operations use. All participants were directly responsible for IT, operations, or strategy at enterprise companies.

A total of 361 qualified participants completed the global primary research survey to understand observability challenges in modern applications with complex environments. The research also investigated the adoption of intelligent automation, site reliability engineering (SRE), and AIOps to mitigate IT and business challenges. The survey was administered electronically, and participants were offered a token compensation for their participation. Participants were from all 5 continents.

Five users of Broadcom's AIOps platform were selected at random from a list provided by Broadcom and interviewed. The interview asked the same questions as in the survey, but also included drill down questions on business and cultural drivers as well as actual benefits received from their current implementation of the solutions. Participants were not compensated. Quotes included in this report were unaltered other than an occasional grammatical correction.



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About Broadcom

Broadcom Inc. is a global technology leader that designs, develops and supplies a broad range of semiconductor and infrastructure software solutions. Broadcom's category-leading product portfolio serves critical markets including data center, networking, enterprise software, broadband, wireless, storage and industrial. Our solutions include data center networking and storage, enterprise, mainframe and cyber security software focused on automation, monitoring and security, smartphone components, telecoms and factory automation. For more information, go to http://www.broadcom.com.

AIOps from Broadcom

AIOps from Broadcom combines a new level of full stack observability and advanced analytics with automation, helping solve complex IT problems before they impact customer experience.

Broadcom's AIOps platform correlates data across users, applications, infrastructure and network services across hybrid-cloud environments across mobile to mainframe. Our decades of domain expertise, along with AI and machine learning applied to varied data sources, provides intelligence for IT operations teams, tames complexity and removes blind spots. The platform includes automation that enables auto remediation. It is delivered on a modern, highly scalable architecture available on-cloud or on-premises.

The solution provides the following capabilities:

- Full-stack Observability: Delivers industry-leading infrastructure, application performance, and network monitoring as well as user-experience analytics.
- Actionable Insights: Utilizes a multi-prong approach of extensive machine learning algorithms plus time, text, patented topological data model, and training for real-time insights across disparate data sets.
- Intelligent Automation: Automatically execute the remediation tasks that your complex, dynamic enterprise environment requires. Using machine learning techniques, the solution recommends actions based on machine training and input from experts, giving you a new level of confidence when performing remediation.
- Digital Agility: Connects data across development and operations, providing continuous feedback loops for continuous improvements.