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AIOps: Applying DevOps to Competitive Advantage

Presented by: William McKnight

"#1 2025 Global Thought Leader and Influencer in Cloud and in Data Center" Thinkers360

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Data Management

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Dataversity Analytics Architecture with William McKnight 2026

1. 2026 Trends in Analytic Architectures
2. What Does Information Management Maturity Look Like in 2026
3. The Data Product Revolution: Unlocking Business Value
4. Building Effective RAG Applications
5. Data Professionals in the AI Age: What's Next?
6. The Master Data Management Dilemma: To Buy or Build, That is the Question: Benchmark Completed
7. Promising AI Use Cases for the Enterprise in 2026
8. Data Mastery: William Answers Your Questions
9. Data Pipeline Engineering Strategies
10. How to Work with Open Table Formats
11. The ROI of Agentic AI: Strategies for Success
12. Data Architecture 2027: What enterprises are building today and why

AI Interest is at an all-time High and Growing

Hundreds of companies will be built around an API for something like ChatGPT

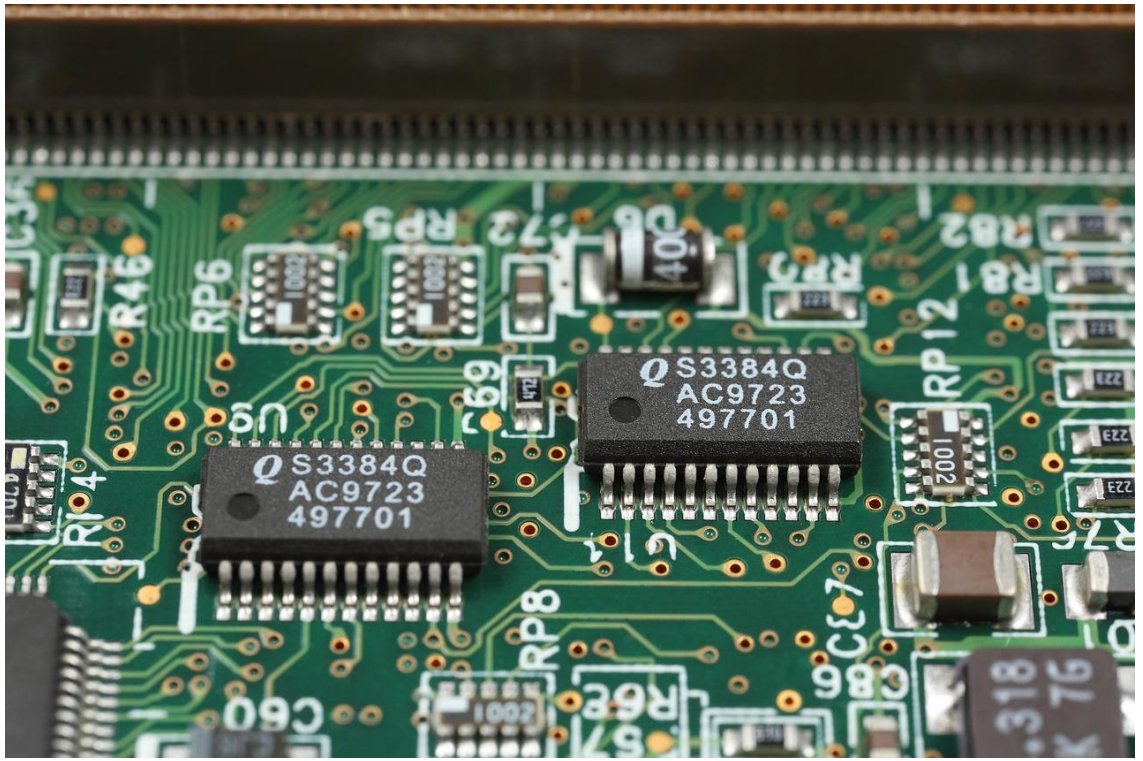
Startups will not be able to create the AI themselves, but they can use the APIs

Nearly every industry and nearly every vertical is being transformed today

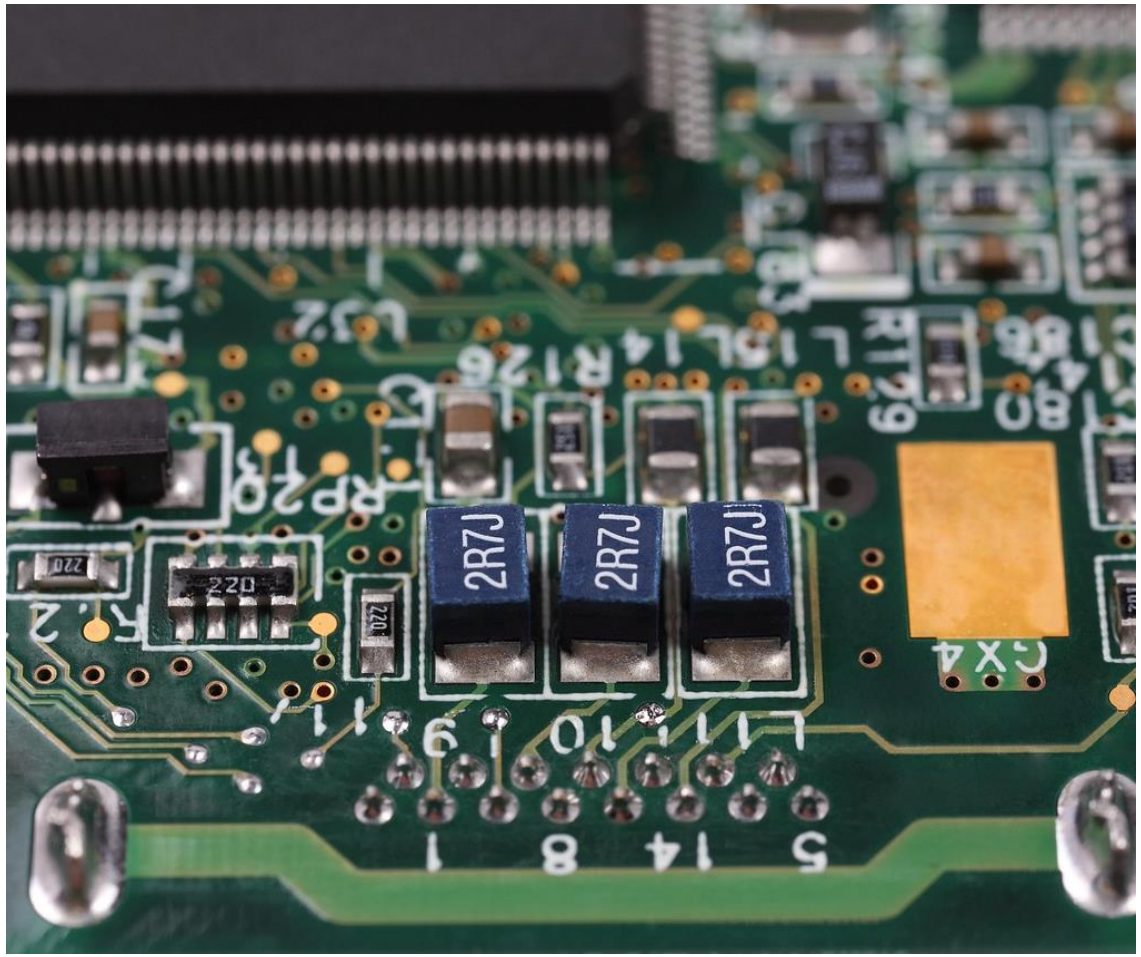
Companies are using these techniques in software and statistical models to make predictions and drive businesses forward in a way that they're not able to with only humans

AI Beyond Operations

- **Customer Service Automation**
  AI is reshaping support with chatbots and virtual agents that deliver instant, consistent help and reduce operational load.
- **Personalized Marketing Strategies**
  AI analyzes behavior in real time, enabling tailored content and smarter targeting that lift engagement and conversion.
- **Innovative Product Development**
  AI accelerates design cycles with rapid prototyping, predictive quality checks, and creative assistance across industries.



What is AIOps



AIOps is a cutting-edge approach that harnesses machine learning, large-scale data analytics, and automated processes to enhance and streamline IT operations.

By gathering streams of telemetry from network, servers, applications, and other infrastructure elements, AIOps detects patterns and irregularities as they occur.

This real-time insight enables enterprises to anticipate service interruptions, quickly pinpoint the underlying causes of issues, and automatically execute routine remediation actions.

Emerging Practices Have Led to AIOps

- Infrastructure Complexity
- Prevalence and Importance of data
- ML Capabilities
- Digital Transformation
- Observability
- Inconsistent and Noise-Driven Monitoring

AIOps and DevOps

- **Synergistic Loop** – AIOps and DevOps reinforce each other, creating a continuous, mutually-beneficial cycle.
- **Continuous Deployment Boost** – By automating problem detection and remediation, AIOps cuts the time and risk of pushing code to production, giving teams confidence to release faster.
- **Cross-Team Insight Sharing** – AIOps surfaces actionable data across the entire tech stack, ensuring developers, operators, and product folks all see the same picture and can collaborate more effectively.
- **Automated Healing** – Leveraging AI-driven automation, AIOps enforces the "fix it fast" DevOps principle by resolving known issues without human intervention.
- **Accelerated Delivery Pipeline** – Using telemetry from build, test, and deployment phases, AIOps feeds early feedback to developers, shortening the software-development lifecycle and improving quality.
- **Enhanced Value Flow** – By embedding AI into the CI/CD feedback loop, AIOps drives proactive operations and rapid incident response, smoothing the path from code commit to customer value.

AIOps vs. DevOps Value

AIOps Automation and Intelligence

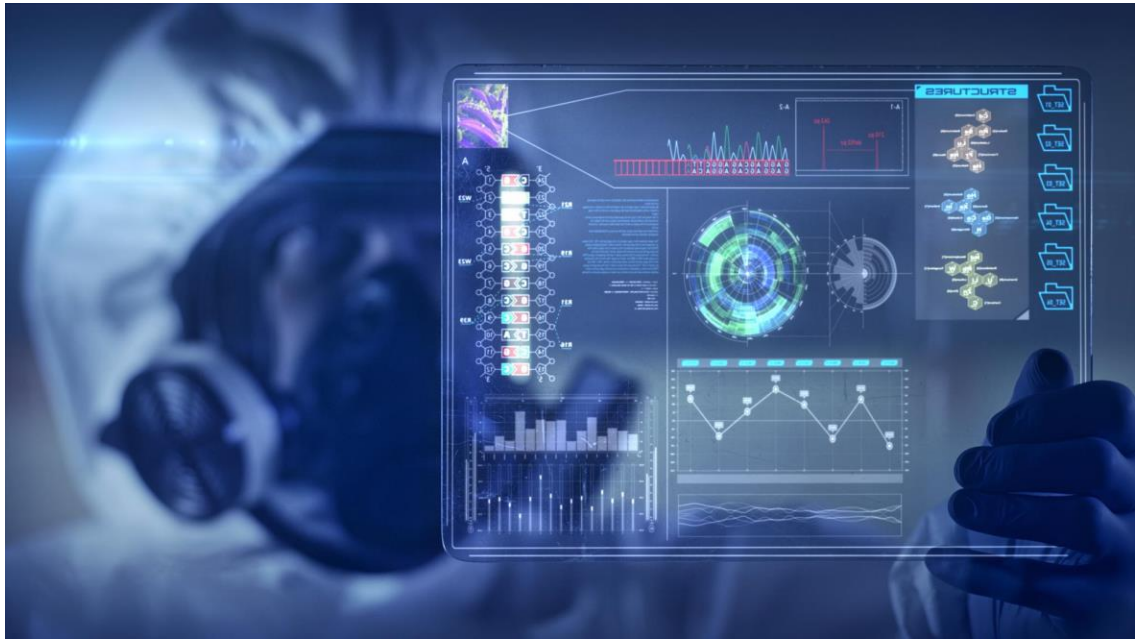
AIOps uses artificial intelligence to automate IT operations, providing predictive analytics and improved efficiency through intelligent automation.

DevOps Collaboration and Delivery

DevOps centers on team collaboration and continuous integration, enabling faster software delivery and enhanced agility in development cycles.

Enhanced Monitoring and Insights

AIOps introduces advanced monitoring, incident response, and deeper insights into system performance compared to traditional DevOps practices.



Why AIOps Matters Today

- Modern systems are too large and complex for manual monitoring.
- Cloud, microservices, and distributed systems create massive data volumes.
- AI helps detect issues faster and prevent outages.
- Modern systems have outgrown human-only monitoring.
- Cloud, microservices, and distributed architectures generate overwhelming data.
- AI enables real-time detection and prevention instead of firefighting.
- Costs are rising – and waste is invisible without AI.
- Security threats are faster and more automated.

AIOps in Data Lake Projects

- **Automated Data Monitoring**
  AIOps automates oversight of massive data flows, improving scalability and reducing manual effort.
- **Proactive Issue Resolution**
  Machine learning detects anomalies early and resolves issues before they disrupt operations.
- **Enhanced Data Quality & Security**
  AIOps strengthens data integrity and security by continuously analyzing patterns and preventing threats.

Key Benefits of AIOps

1. Better Efficiency
American Airlines uses AI to watch thousands of servers automatically.
Result: 40% fewer routine tasks for staff, so they can focus on important work.

2. Predict Problems Before They Happen
PayPal uses AI to spot unusual patterns in transactions and storage systems.
Result: They catch issues in **minutes**, preventing outages.

3. Fix Issues Faster
Netflix uses AI to automatically roll back bad updates or reroute traffic.
Result: Problems get fixed in **minutes instead of hours**.

4. Smarter Decisions
Walmart uses AI to predict when their systems need more capacity (like during holidays).
Result: They avoid spending millions on unnecessary servers.

5. Saves Money
United Airlines uses AI to reduce waste in cloud computing.
Result: Millions saved each year.

6. Stronger Security
Capital One uses AI to spot unusual network behavior.
Result: They catch threats faster than traditional tools.

7. Learns and Improves Over Time
Datadog's AI becomes more accurate as it sees more data.
Result: Fewer false alarms every year.

AIOps Market Champions

- **AI-Driven Monitoring**
- Dynatrace leverages AI for advanced monitoring and automated root cause analysis, supporting complex IT environments.
- **Event Correlation Automation**
- BigPanda excels at event correlation and incident automation, streamlining IT operations management for faster response.
- **Integrated Observability Tools**
- New Relic provides robust observability tools with AI integration, enabling proactive issue detection and performance optimization.

Mechanics of AIOps

Automated Data Collection

AIOps systems continuously gather large volumes of IT data from many sources to monitor operations and performance.

Pattern and Anomaly Detection

Machine learning identifies normal patterns and spots anomalies in real-time, enabling fast issue detection and prevention.

Predictive and Root Cause Analysis

AIOps predicts potential issues and pinpoints root causes, improving reliability and accelerating problem resolution for IT teams.

Why AIOps Matters for Data Professionals

- Ensures reliability of data integrations, pipelines, ingestion services
- Monitors data API performance and latency
- Detects anomalies before data quality is impacted
- Ensures consistency across data platforms
- Automates the “boring but critical” operational tasks
- Frees data engineers to focus on high-value work

When to Adopt AIOps

- **Alert overload** – Organizations drowning in notifications from legacy monitors or struggling with hard-to-trace outages look to AIOps for smarter signal filtering.
- **Cloud-native sprawl** – Microservices and containers produce a torrent of metrics, making manual correlation infeasible; AIOps delivers automated insight.
- **Regulatory constraints** – Financial and healthcare firms adopt AIOps to uphold rigorous SLAs and compliance requirements.
- **Digital-first sectors** – Industries where online services define the customer experience (e.g., retail, media) gain the most from AIOps.
- **Growth** – Expand IT operations without a commensurate rise in headcount.

Dynatrace

- OneAgent runs on hosts/containers to collect telemetry
- Smartscape maps dependencies automatically
- Davis AI correlates logs, metrics, traces

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Telemetry

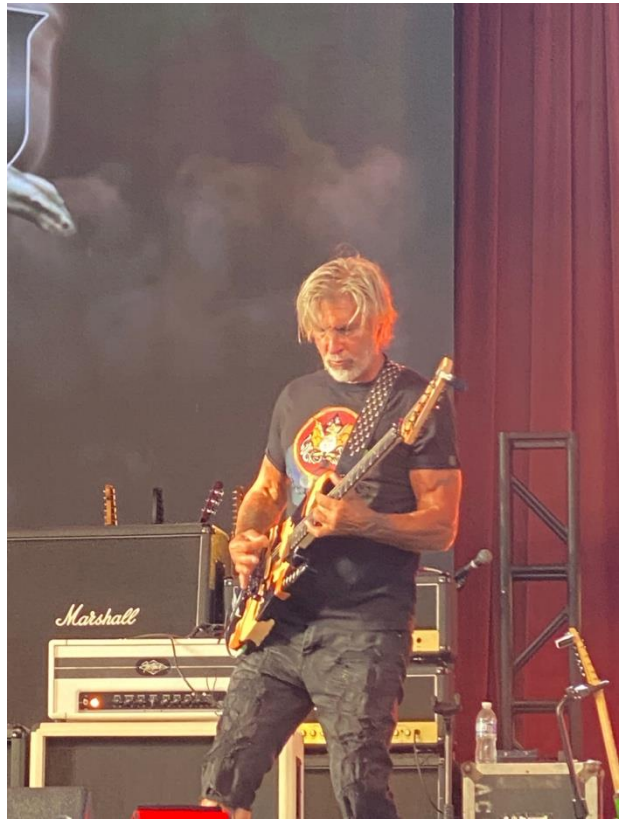
- **Infrastructure metrics** – CPU usage, memory consumption, disk I/O, network latency, and process-level health from hosts, containers, and cloud VMs.
- **Application-level data** – response times, error rates, throughput, and method-level traces for services built in Java, .NET, Node.js, etc.
- **User-experience signals** – page load times, interaction delays, and JavaScript errors from real-browser sessions and mobile apps.
- **Custom business metrics** – transaction counts, order values, or any KPI you expose via the Dynatrace API.
- **Log and event streams** – syslog entries, Windows event logs, and Kubernetes events that are automatically correlated with the metrics.

Using Dynatrace Day-to-Day

- Analyze service performance
- View distributed traces for slow data integration paths
- Monitor database calls, error rates, queue lag
- Create dashboards for pipeline health

What an AIOps Professional Does

- Configures monitoring & tagging strategy
- Optimizes alerting and dashboards
- Automates workflows with Davis AI
- Supports SRE & data engineering teams



What AIOps Automates

- Root-cause analysis
- Discovery of topology
- Baselining & anomaly detection
- Service naming & tagging rules

Dynatrace + Data Lake Projects

- Monitor ingestion pipelines and microservices
- Track latency between processing stages
- Alert on data freshness issues indirectly via pipeline health
- Integrate logs from Spark, Kafka, Snowflake connectors

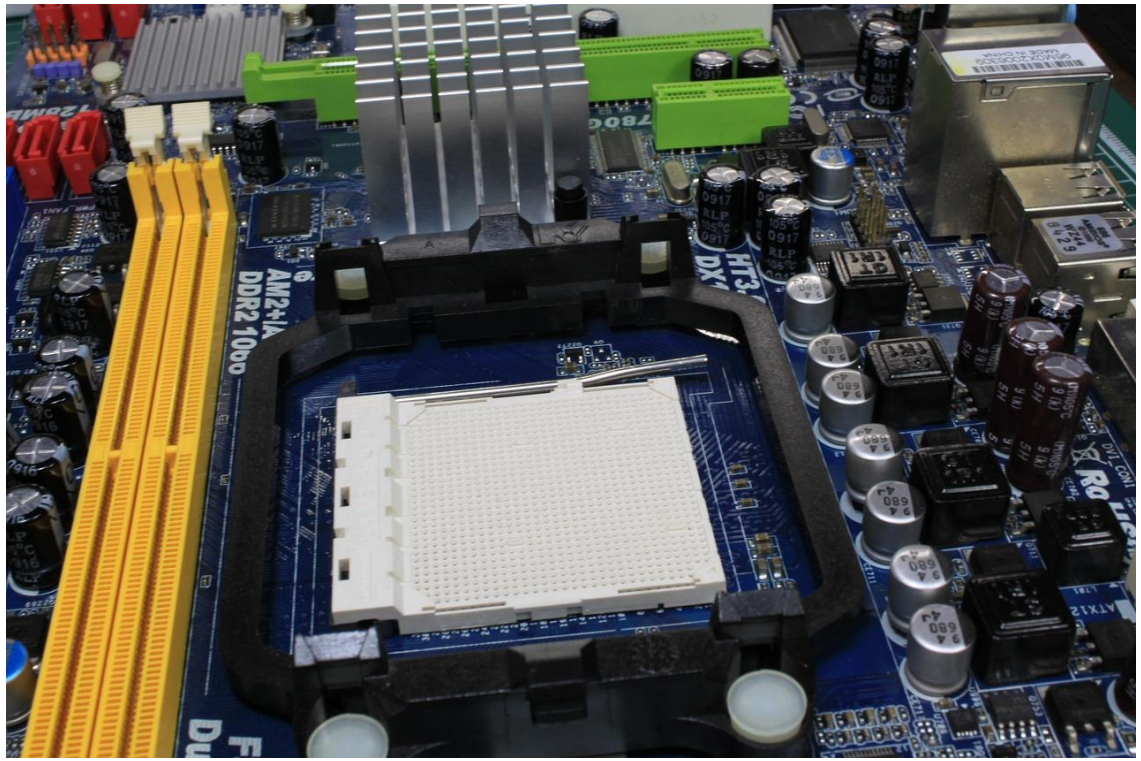
Example: Monitoring a Data Pipeline

- OneAgent monitors compute nodes
- Traces reveal bottleneck in transformation step
- Davis correlates to resource saturation
- Dashboard shows pipeline end-to-end timing

Dashboards & Analytics

- Custom KPIs for data SLA compliance
- Charts for throughput, latency, error spikes
- Log queries for pipeline failures
- Business events for data-dependent KPIs

AIOps Architecture



- OneAgent on compute nodes, gateways on clusters
- Data lake components monitored: Kafka, Spark, API gateways, DBs
- Service-level topology auto-mapped

Data Sources in AIOps

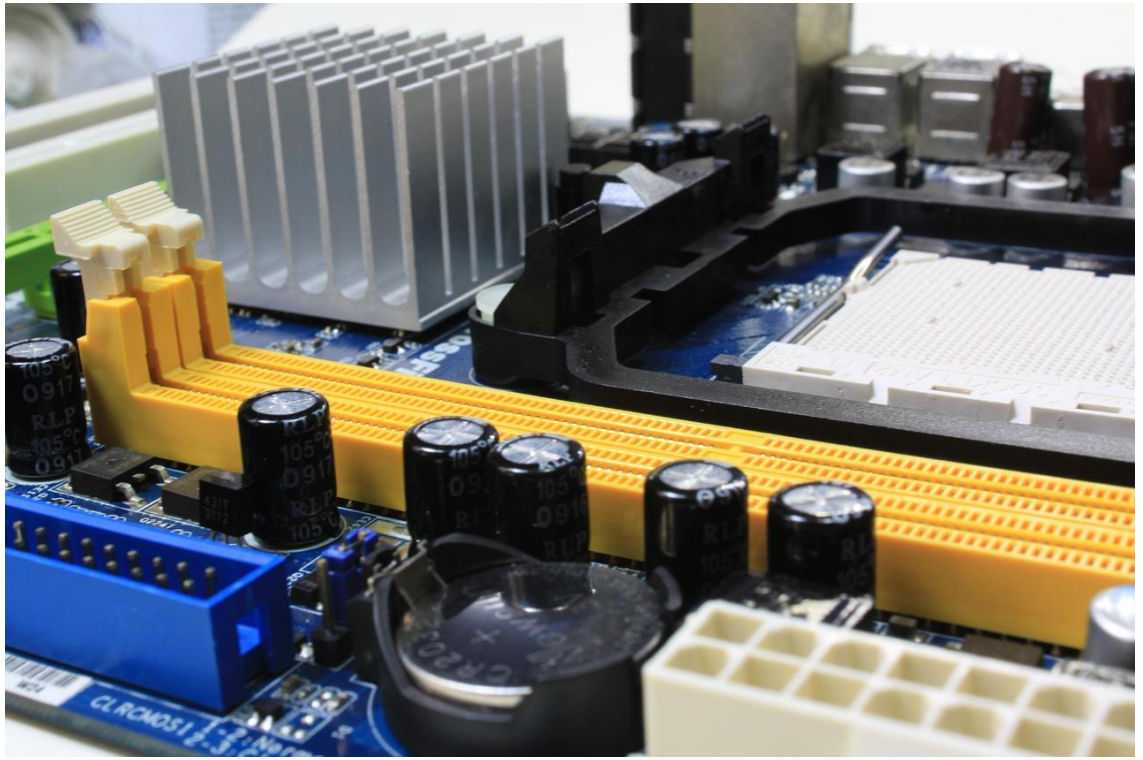
- Logs
- Metrics
- Traces
- Events
- Configuration data
- Tickets & incidents
- User behavior data

AIOps Tool Types

- Data ingestion & enrichment – gathers logs, metrics, events, and topology data; common tools include Splunk, Elastic Observability, and Dynatrace.
- Anomaly detection – applies machine-learning models to flag outliers as they happen; platforms such as Moogsoft, BigPanda, and Cloudwise are typical examples.
- Root-cause analysis – links related alerts together to identify the true source of a problem, often using graph-based algorithms (e.g., ServiceNow AIOps, AppDynamics).
- Automation & runbooks – initiates automatic fixes or coordinates workflows, integrating with solutions like Ansible, Terraform, and PagerDuty.
- Continuous improvement – uses feedback loops to refine models, with many systems providing built-in dashboards for tuning.

Common Challenges

- Lack of a strategic approach
- Lack of scaling AIOps
- Data quality
- Picking initial scope
- Organizational change
- Under-resourcing the technically complex deployment



AIOps: Real-World Applications

Automated Incident Detection

AIOps automates the detection and response to IT incidents, reducing downtime and improving operational efficiency.

Intelligent Root Cause Analysis

Using intelligent data correlation, AIOps streamlines root cause analysis, quickly identifying and resolving issues.

Predictive Resource Planning

AIOps predicts future infrastructure needs and system failures, allowing proactive planning and reducing service disruptions.

Industry-Specific Examples

- Financial Services: Fraud detection, detecting and blocking fraudulent activities in real-time.
- Retail: Optimization of the supply chain, predicting inventory needs, and adjusting orders automatically.
- Manufacturing: Equipment maintenance, scheduling maintenance to prevent machine failures.
- Telecom: Network performance monitoring and prevention of network outages.
- Healthcare: Predicting health issues and alerting medical staff for early intervention

Real-World Outcomes

- Faster resolution of incidents.
- Predicting failures before they happen.
- Lower operational cost.
- Better user experience.
- Improved uptime and reliability.

Picking an AIOps Tool – Basic Features

- **Multi-modal data protection** – end-to-end encryption for data at rest, in transit, and during processing.
- **Team coordination** – built-in collaboration features that sync workflows across groups.
- **Graphical reporting** – interactive dashboards that turn data into clear visual insights.
- **Identity and access governance** – robust controls for authentication, authorization, and user permissions.
- **IT-ops connectivity** – seamless integration with existing operational toolchains.
- **Cause identification** – automated analysis to uncover the underlying source of an issue.
- **Forecasting abilities** – AI-driven predictions that anticipate problems before they emerge.
- **Live event surveillance** – continuous, real-time tracking of system occurrences.

Advanced Features

- **Stealth change spotting** – Detects undocumented or surprise configuration shifts that could spark incidents, helping guard against drift and hidden operations.
- **Self-healing actions** – Automatically initiates corrective measures when problems arise, limiting downtime and freeing teams for higher-impact work.
- **Event correlation & cause determination** – Links related occurrences and pinpoints underlying reasons across complex, interdependent systems, speeding up diagnosis and resolution.
- **Outlier identification** – Highlights abnormal activity across infrastructure and applications early, cutting mean-time-to-detect and exposing hidden faults.
- **Conversational AI assistance** – Offers natural-language querying, auto-generated documentation, and smart summarization to make information more accessible and reduce engineer cognitive load.
- **AI at the Edge** – Processes data locally on devices or edge nodes, enabling low-latency, bandwidth-constrained, or data-sovereignty use cases that can't rely on a central AIOps hub.
- **Green IT analytics** – Surfaces the environmental impact of infrastructure (energy use, carbon emissions, idle resources) to help teams meet ESG and sustainability targets.
- **Automated root-cause inference** – Uses AI to uncover true causes of incidents, not just correlated events, employing statistical or graph-based reasoning for hands-free analysis.
- **Proactive security risk management** – Forecasts security threats by analyzing AIOps telemetry and behavior, embedding preventive controls that bridge ITOps and SecOps.
- **Integrated observability** – Merges AIOps with full-stack visibility across infrastructure, applications, and user experience, eliminating monitoring silos for a unified view of system health.

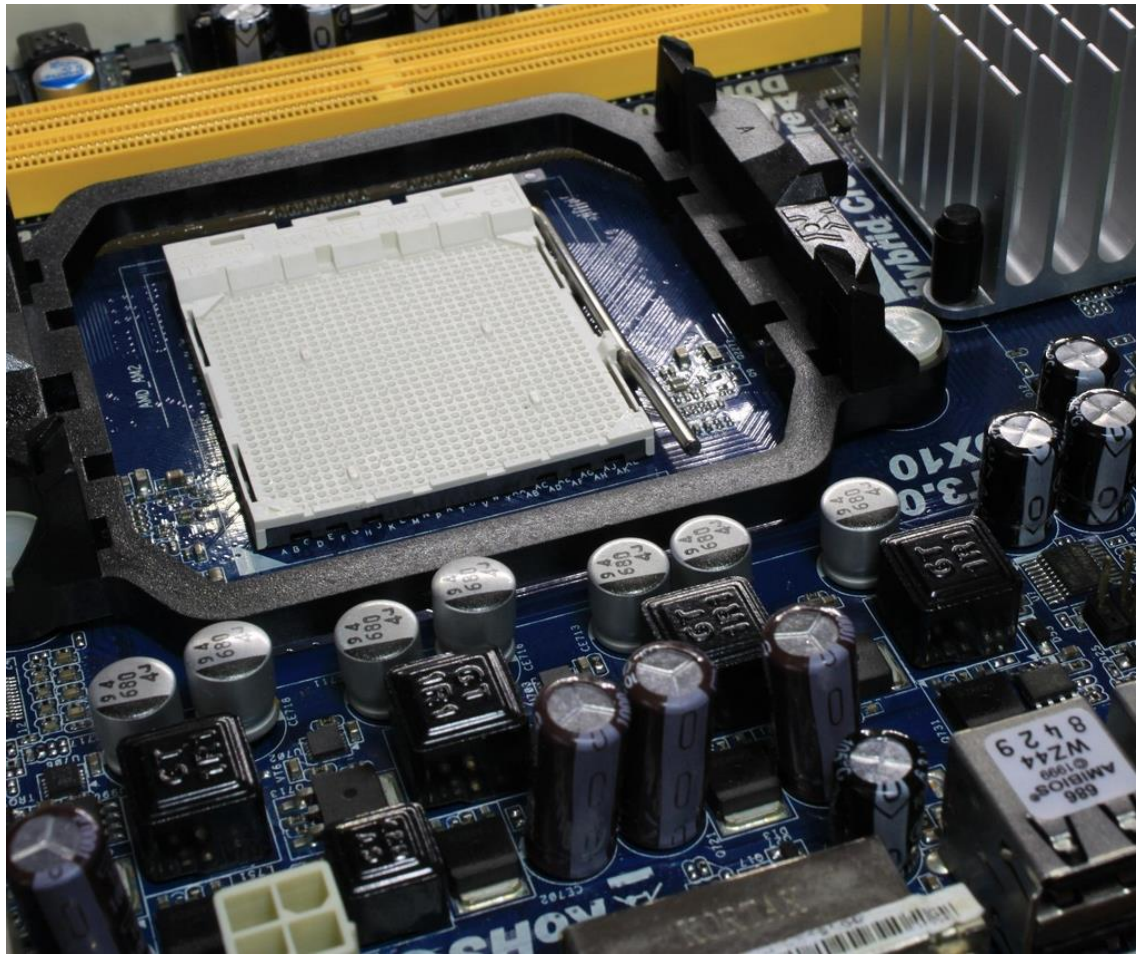
How to Get Started

- Start with monitoring & observability basics.
- Explore logs, metrics, and dashboards.
- Understand machine learning fundamentals.
- Begin with monitoring.
- Next: Alert correlation and reducing noise.
- Then: Automated runbooks.
- Finally: Predictive analytics & full automation.

The AIOps Journey

- Initiate a small-scale trial focused on a single application stack or mission-critical service before expanding the rollout.
- Guarantee that data is clean, well-organized, and properly labeled to maximize the effectiveness of AI/ML models.
- Form multidisciplinary teams that bring together diverse expertise.
- Embrace an iterative improvement culture, continually tweaking algorithms, automation rules, and correlation logic as the environment changes.
- Ensure autonomous fixes are subject to safeguards to avoid unwanted results.
- Sustain an ongoing feedback channel between technical and business stakeholders so AIOps outcomes stay aligned with enterprise objectives.

Building AIOps Skills



- Learn Prometheus & Grafana
- Study log analysis
- Practice anomaly detection
- Understand DevOps workflows & automation

AIOps: Future Outlook

Enhanced Automation in IT

AIOps boosts automation, streamlining repetitive tasks and freeing IT teams for strategic work.

Proactive Issue Detection

AIOps enables early detection of issues, minimizing downtime and improving reliability across systems.

Integration with Multi-Cloud

Future AIOps will support multi-cloud environments, facilitating seamless management and agility for businesses.

Summary

- AIOps automates, predicts, and improves IT operations
- It's critical for modern, complex environments
- AIOps reduces complexity by unifying logs, metrics, traces, and events to detect issues earlier and automate response
- It improves reliability across data pipelines, microservices, and cloud environments by spotting anomalies, drift, and bottlenecks in real time
- Tools like Dynatrace provide deep observability, automated root-cause analysis, topology mapping, and Davis AI-driven insights
- AIOps helps data teams track SLAs, data freshness, pipeline latency, and integration performance end-to-end
- Common challenges include data quality, unclear goals, too-broad initial scope, and lack of cross-team alignment
- When adopted with clear outcomes and good DevOps practices, AIOps leads to faster incident resolution, lower costs, and better user experiences

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