

IT Operational Analytics

The Future of Business Intelligence and
Predictive Management



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EXECUTIVE OVERVIEW

Analytics offer data-driven business intelligence by revealing patterns in data and projecting future conditions via predictive modeling. IT operational analytics (ITOA) are emerging because companies increasingly rely on IT for revenue-producing services. ITOA is vital for managing IT environments that are complex, virtualized, dynamic, and distributed, including in clouds and third-party environments. ITOA allows services to be controlled from a fact-based business perspective. *Performance management* analytics offer visibility into IT environments to proactively resolve issues before they impact services and end-users.

Capacity management analytics model future states for predictive capacity planning and provisioning. As cited by Gartner¹ and Enterprise Management Associates (EMA),² BMC is a leading vendor of ITOA solutions. *BMC Performance and Availability* is a set of modular, yet integrated offerings that provide unprecedented views into service delivery chains from data centers to users' computers and mobile devices. Rather than react to issues, IT staff can gain predictive capabilities to ensure both IT service levels and user expectations are met, no matter where users are located or how they access their services.

WHAT ARE IT OPERATIONAL ANALYTICS?

Analytics produce fact-based business intelligence through the automated discovery of patterns, relationships, and trends in data. Analytics inform decision-making with descriptive and predictive modeling of future states and conditions. Enterprises in all sectors rely on analytics to rationalize business choices. Most organizations now use analytics to uncover insights from marketing data to target customers with new programs. Others are using analytics to mitigate risk and project returns on investment. Your organization likely relies on some form of analytics to fulfill its objectives.

A powerful application of analytics has emerged—IT operational analytics (ITOA). First generation IT analytics provided comprehensive visibility into the current state of the IT infrastructure that revealed usage and issues. ITOA then delivered proactive insights that uncovered issues an hour or so *before* they impact services. Advanced ITOA now delivers predictive capabilities—days, weeks, months, even a year into the future. An IBM survey found that 63 percent of organizations realize a competitive advantage through information and analytics.³

ITOA is now critical because IT environments that once supported just a business's internal processes, today often support the business itself. Data centers are *business* centers delivering the applications, services, and transactions that power commerce. From industry and government to science and entertainment, business and social interactions increasingly occur with digitally-delivered services, the quality of which defines a company's market position. As a result, you need to manage your services from a business service perspective because any degradation can impact your firm's reputation, customers, and revenues. Case in point, according to industry experts, today's Fortune 500 businesses lose between \$84,000 and \$108,000 (U.S.) for every hour of IT system downtime.⁴

To optimize service delivery, you need holistic, real-time views of the entire service delivery environment, as well as granular insight into its every component. In other words, you must see both the forest *and* the trees. Moreover, you need insight not only into your service's present state, but also into its past and future states to model the impacts of usage, scaling, and changes.

Because modern IT environments are large and complex, it is not humanly possible to analyze the millions of inter-related data points that they generate. Service delivery in these environments involves countless interdependencies between applications, servers, and the network. Virtualization adds to the complexity, as applications and data move fluidly between hosts. Service delivery is also increasingly distributed. Resources are shared in clouds and services appear, grow, contract, and disappear on demand, with IT staff often having no knowledge of the changes.

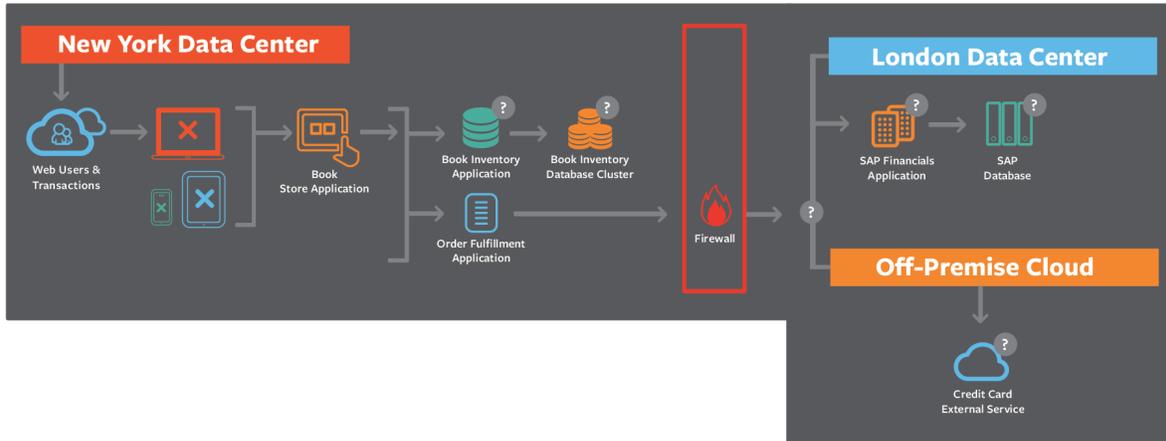
1 Deploy a Multivendor Strategy for Availability and Performance Monitoring, Jonah Kowall, 4 Dec 2012 Retrieved from <http://www.gartner.com/id=2263415>

2 *EMA Radar for "Advanced Performance Analytics (APA) Use Cases*, Dennis Drogseth, Dec 2012 Retrieved from http://media.cms.bmc.com/documents/EMA-APA_Q4_2012_Radar-BMC_Profile.pdf

3 *Analytics: The real-world use of big data*. IBM Global Services, 2012. Available at <http://www-935.ibm.com/services/us/gbs/thoughtleadership/ibv-big-data-at-work.html> and supported by unpublished BMC analysis

4 <http://www.it-director.com/business/costs/content.php?cid=12043>

Performance Problems Take Too Long to Solve

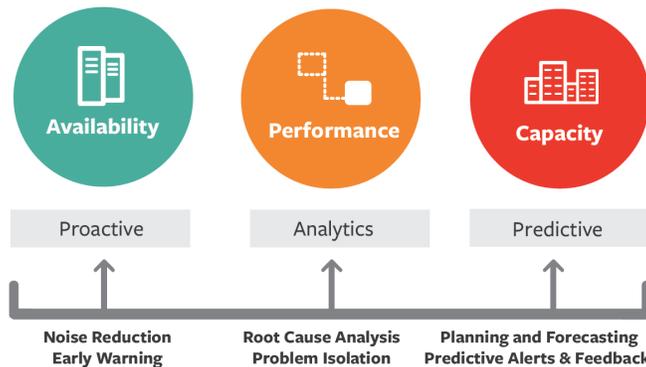


The value ITOA provides is comprehensive visibility into, and understanding of, the services running on physical, virtual, and hybrid cloud infrastructures, and how they map to their business demands. With ITOA, you can manage complex, highly dynamic IT services and resources from the perspectives of both the user and the business. You will meet customer expectations, control costs, improve efficiencies, and reliably deliver services—even as your business grows and evolves.

VISIBILITY INTO IT OPERATIONAL ANALYTICS

ITOA consists of two key areas. *Performance* analytics offer a proactive approach to IT operations management for near-term issue detection and resolution. *Capacity* analytics enable a predictive approach for simulation and medium to long-term provisioning.

The Value of IT Operational Analytics



Performance Management

Service Levels: Understand how your users experience your services

As enterprises increasingly rely on IT services for their business, knowing how end users experience these services is vital business intelligence. Responsive services offer competitive advantages whereas sluggish services decrease internal user productivity, drive customers to competitors, and erode profitability.

ITOA solutions leverage end-user performance and transaction data to provide visibility into the entire service delivery chain down to end users, regardless of their locations or the devices they use to access the service. User-centric analytics offer insights into service levels, user behavior, and the fulfillment of business transactions, ensuring IT response times that engender satisfied users.

Gain proactive control of service performance and availability

IT staff generally react to events. Most discover issues as their users do. ITOA empowers staff to proactively address issues before they manifest as service disruptions. **Behavior learning analytics** track performance metrics by collecting data from each service's ecosystem to "learn" and automatically adjust baselines of "normal" service behavior. By applying patented statistical and trending algorithms, they can project when a service is likely to fail to meet its service levels and then alert your staff. Instead of knowing an issue *is* occurring, you will know an issue *is likely* to occur within a few hours, shifting from reactive management to proactive control of business-critical services.

Prioritize service issues by business value

Your staff must prioritize events and trouble tickets that threaten vital business services and service levels. However, they continually receive streams of notifications of events, trouble tickets, and abnormal behavior. Some may signify only a spike in traffic rather than a service in jeopardy. Others may indicate a modest impact on a non-critical, back-office resource rather than a customer-facing portal. Your staff must spend countless hours sleuthing through the data to identify those issues with a true business impact.

Service impact analysis utilizes real-time service models with information from configuration management databases and real-time monitoring to define the entities that comprise a service, and their relationships to each other. ITOA then identifies which service(s) are being impacted by a faulty component so your staff can prioritize work based on impending business consequences.

Isolate the actual problem

A key value of ITOA is **root cause analysis**. Once service impact analysis determines that an essential service is in jeopardy, your staff must identify the problem's root cause. Alerts and events, however, may only be symptoms. For example, an application might be running slowly, but the actual problem could be upstream with a database, a server, or even a network connection. Performance analytics can assess all the devices and components that deliver the service along with all the users who access the service. They evaluate recent abnormalities, alerts, and events along with configuration changes (planned or unplanned), and allow your staff to drill down to the core problem.

Root cause analytics ensure prompt remedial action by eliminating the need to sort through mazes of disparate but interconnected technologies and massive amounts of data. Fewer people are needed to identify, prioritize, and diagnose business-crippling problems, and mean-time-to-repair (MTTR) is greatly accelerated.

Capacity Management

Anticipating the needs of a service weeks or months into the future is challenging. If applications, servers, storage pools, or network systems are insufficiently provisioned, they will be overtaxed and will underperform. Yet, overprovisioning a service's components wastes capital and operational budgets.

Capacity analytics analyze current and historical trends and project what-if scenarios onto your networked assets and environment, even in third-party clouds. They use performance management data and service models to forecast the impacts of growth and changes in the coming months. You can determine ideal utilization rates, anticipate stresses and vulnerabilities, and model how to best satisfy anticipated demand.

Your staff can model thousands of servers to determine which are underutilized and which should be consolidated. They can run what-if scenarios when expanding a data center or reducing its footprint for lack of air conditioning. They can ascertain the impact of seasonal demand, a successful marketing initiative, or changes in hardware and software platforms/vendors.

Capacity management also addresses common causes of service disruptions, which are changes stemming from updates, patches, and scripts that cause configurations to drift from desired states. You can model planned changes before they are made to avoid introducing issues to the production environment.

Whereas performance management offers visibility hours into the future for proactive control, capacity management is truly predictive. Your staff can project performance metrics months or years into the future. With data-driven intelligence, you can plan, cost-effectively place and provision, and dynamically adjust workload allocations for anticipated demand and market conditions, ensuring predictable service levels. Further, you can gain visibility into the costs of service delivery and, ultimately, better align IT with the business.

IT OPERATIONAL ANALYTICS BEST PRACTICES

What are best practices for deploying IT Operational Analytics (ITOA)? Analytics tools need to function in complex, multivendor service delivery frameworks. They must provide end-to-end visibility across the entire service delivery landscape, from mainframes and servers in the data center to public clouds and consumers' homes and phones. They must take a services-centric approach to management to ensure that service delivery aligns to business needs and value.

ITOA tools need to integrate with each other for ease of use. Capacity management, for example, should leverage data collected by a performance management solution to avoid redundant functionality and overhead, and both should present data tailored to various end-user roles (e.g., IT operator, IT architect, service manager, financial manager, etc.) to expedite staff awareness of trending and issues.

Yet, these systems should also be modular so you can deploy them in a staged manner as your staff gains expertise in harnessing analytics. You can start with real-time analytics, migrate to proactive management, and finally implement predictive capabilities. You may choose to implement predictive capacity capabilities in tandem with real-time analytics, particularly if your organization is adopting virtualization and cloud technologies. Incremental deployment offers a rapid return on investment; as tools are installed, they leverage each other to provide deeper and better intelligence and, as a result, exponentially greater value.

Analytics Drive Intelligent Workflows



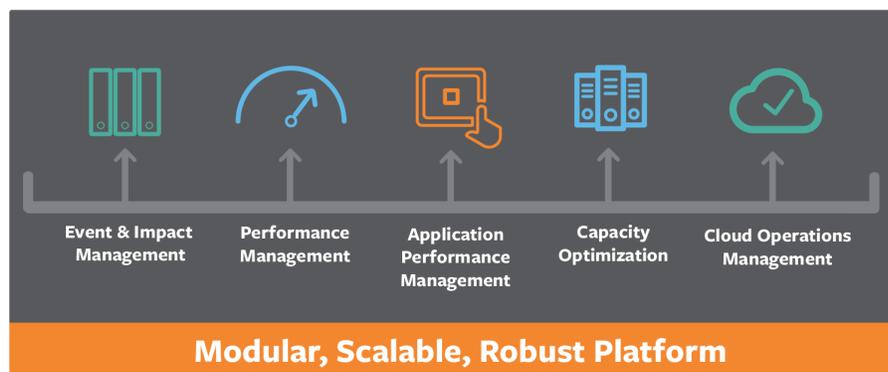
Finally, ITOA solutions should feature intelligent automation and workflows, which are essential in highly automated environments like clouds. With automation from discovery to resolution, you can greatly reduce the manual intervention and costs needed to troubleshoot and plan service delivery. Coherent, machine-generated responses enable the most rapid issue-resolution possible and the reliable continuity of business-class service levels.

BMC: AN INDUSTRY LEADER

BMC is a recognized leader in ITOA. BMC was the only vendor awarded by Gartner with the highest rating in Event Correlation and Analytics (ECA), IT Operational Analytics, and Capacity Planning.⁵ In a survey of providers of analytics, EMA found BMC to be a leader “in functionality and architectural strength, and a clear Value Leader...” and “the single strongest vendor in integrated capacity, change impact and performance management.”⁶

BMC Performance and Availability is a comprehensive set of solutions that provide the foundation for modernizing your data center at your own pace, with modular, yet unified enterprise and cloud management. You can deploy those components that meet your current needs today and then seamlessly add more functionality over time. They share a common data collection and alerting architecture to apply capacity and performance analytics across all data sources.

Scaling to over a million managed entities, *BMC Performance and Availability* is vendor and platform neutral and offers unsurpassed functionality. It allows for analytics-driven visibility and control in any environment and with any technology, from mainframes to the latest cloud innovations. BMC Performance and Availability delivers both granular and holistic insight, analysis, and automation within each discipline, such as service impact management or capacity optimization, while automating workflows across disciplines, like feeding predictive capacity alerts into event management.



The following introduces the key components of BMC Performance and Availability.

BMC ProactiveNet Performance Management for Event, Impact, and Performance Management

BMC ProactiveNet Performance Management (BPPM) is the cornerstone of *BMC Performance and Availability*. The best-of-breed solution extends event, impact, availability, and performance management to physical, virtual, private cloud, and public cloud resources, including Amazon Web Services and Windows Azure. BPPM delivers insight into every component that could impact the performance and availability of your applications and services.

Of all competing solutions, only BPPM automates the *entire* workflow for issue resolution, from detection and prioritization to diagnosis and resolution. This includes threshold maintenance, problem detection, event prioritization, impact analysis, intelligent ticketing, root cause isolation, and automated repair.

BPPM elevates IT analytics beyond dynamic baselining. It uniquely integrates dynamic behavior learning and real-time service impact and root cause analytics with multiple data sources, change information, service models, and key business

⁵ *Deploy a Multivendor Strategy for Availability and Performance Monitoring*. 4 December 2012. ID: G00245295. Retrieved from <http://www.gartner.com/id=2263415>

⁶ *EMA Radar for “Advanced Performance Analytics (APA) Use Cases*, Dennis Drogseth, Dec 2012 Retrieved from http://media.cms.bmc.com/documents/EMA-APA_Q4_2012_Radar-BMC_Profile.pdf

metrics. By factoring in such fluctuations as increases in seasonal demand, BPPM prioritizes events based on their service impacts and issues fewer but more astute alerts. It delivers the earliest and most accurate detection, prioritization, diagnosis, and resolution of service impacts. As EMA noted, “BMC is one of the true industry leaders in APA (Advanced Performance Analytics) with its ProactiveNet....”⁷

By integrating with the BMC BladeLogic Automation and BMC Remedy Change Management solutions, BPPM decreases the time and costs needed to assess the impact of changes. During problem isolation, your staff can quickly see that a change was made just prior to a change in performance, and then initiate automated workflows to revert to the original state if desired. Staff can reduce service outages and focus on MTBF (mean time between failure) rather than MTTR (mean time to repair).

With unprecedented proactive problem detection to resolution functionality and automation that boosts productivity and minimizes risk, you can deliver the highest quality of service and ensure SLAs are always met. Rather than reactively managing services, your staff will operate proactively and more efficiently.

BMC Application Performance Management

BMC Application Performance Management (APM) delivers invaluable business intelligence—how your applications perform and your users experience them. The solution, one of the industry’s “most evolved,”⁸ captures application response times and end user behavior like abandonment rates, number of pages viewed, time-on-page, and completed transactions. You will know whether service levels are being met, and will be able to link user behavior to application performance.

BMC APM uniquely peers across physical, virtual, and cloud-based web applications, whether in data centers, co-location sites, public clouds, or application or content delivery networks like Akamai. The views extend as far as the web itself, even when accessed by mobile devices, and data collection is transparent to users. You can instantly visualize how your services and applications are performing, access accurate response and performance metrics for customers by group or location, and drill down to examine a single user or transaction, all the way down to the line of code.

BMC APM is “one of the most versatile end user experience management solutions in the industry bar none.”⁹ It enables capacity planning and change management, and offers diagnostics and service level management by application and geography. Your staff will proactively detect and isolate end-user performance issues before they undermine SLAs and transactions. Moreover, BMC APM integrates synergistically with other *BMC Performance and Availability* solutions. For example, your staff can feed end-user performance data into *BMC ProactiveNet Performance Management* to correlate end user performance to the application infrastructure for faster and more accurate root cause and service impact analysis.

BMC Capacity Optimization

Enterprises must know what resources they will need as they grow and introduce or remove services. *BMC Capacity Optimization* uses an unmatched array of analytics to predict current and future compute, storage, and network capacity needs. It supports business services running on all IT systems—distributed, mainframe, physical, virtual, cloud—factoring in business objectives such as orders per minute. Your staff will have visibility into the entire application stack for each service to understand the impact of change and ensure sufficient capacity. The solution can automatically alert when capacity will be exceeded and forward alerts to *BMC ProactiveNet Performance Management* for display in a unified console. You will not only align IT operations with your business’s current requirements, but its future requirements as well.

BMC Capacity Optimization supports what-if scenarios. You can run projections for consolidating a data center, properly sizing the production environment or learning how a new service will perform in the current infrastructure. You can forecast when more bandwidth, storage, CPUs, or memory will be needed, and foresee the impacts of business growth on your service environment. Moreover, you can ensure your IT resources support business initiatives like marketing campaigns or product rollouts.

With optics and intelligence into your current and future infrastructures, you can plan and invest wisely, avoiding the risks of underprovisioning or the profligacy of overprovisioning. Predictive, business-centric capacity management permits you to right-size your service delivery chain and adjust workload allocations when needed.

⁷ Ibid.

⁸ Ibid.

⁹ Ibid.

BMC Cloud Operations Management

As enterprises entrust more and more of their IT infrastructures to private and hybrid clouds, IT staffs must see into these clouds, understand the dynamics of their resources and workflows, and manage them as they do traditional data center environments. Functionalities that make clouds so attractive, however, also render them challenging to administer. Resources are pooled, shared, and dynamically allocated and moved in virtualized cloud environments. Services require elastic infrastructures, as they appear, expand, contract, and vanish according to user demands. Their myriad interdependencies continually change.

For these reasons, *BMC Cloud Operations Management* (Cloud Ops) is extremely useful if your company is deploying clouds or planning to do so. The solution delivers unprecedented business-centric control across the spectrum of cloud services and shared cloud resources. Only BMC combines accurate root cause, performance, and capacity analytics to drive visibility and intelligence in the cloud.

Unlike competing solutions that offer static views of dynamic cloud environments, BMC Cloud Ops uses analytics specifically designed for clouds to track the movement of workloads and provide insight into pooled virtual and cloud resources. It monitors behaviors and policies for every service element, like resource utilization, queue sizes, user response times, and transaction volume. It proactively detects potential issues before they impact services. Its capacity analytics offer capacity-aware advice for intelligently placing workloads in clouds, and enable staff to accurately forecast cloud capacity. It tracks usage and chargeback of services, and issues alerts when utilization nears saturation. BMC Cloud Ops can trigger automated workflows for triage and repair, automated provisioning of monitoring, and chargeback reporting to minimize staff overhead.

THE COMPETITIVE ADVANTAGES OF IT OPERATIONAL ANALYTICS

Enterprises are recognizing the power of ITOA as their IT infrastructures play a greater role in their businesses. With ITOA, they extract greater value from their service environments and operate their IT domains with the same rigor and foresight as they run the rest of their businesses. They leverage ITOA for actionable business intelligence, using knowledge and control to monetize products and services. They reduce uncertainty by anticipating and fixing the faults that impair services and alienate customers. They control service levels, contain costs, and satisfy user expectations even as business and technology landscapes evolve. They maximize investments, optimize business outcomes, and intelligently plan for the future. They not only meet SLAs; they exceed them. Finally, they do more with less.

These are the competitive advantages offered by IT operational analytics.

For more information, go to www.bmc.com/getproactive

BMC delivers software solutions that help IT transform digital enterprises for the ultimate competitive business advantage. We have worked with thousands of leading companies to create and deliver powerful IT management services. From mainframe to cloud to mobile, we pair high-speed digital innovation with robust IT industrialization—allowing our customers to provide amazing user experiences with optimized IT performance, cost, compliance, and productivity. We believe that technology is the heart of every business, and that IT drives business to the digital age.

BMC – Bring IT to Life.



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