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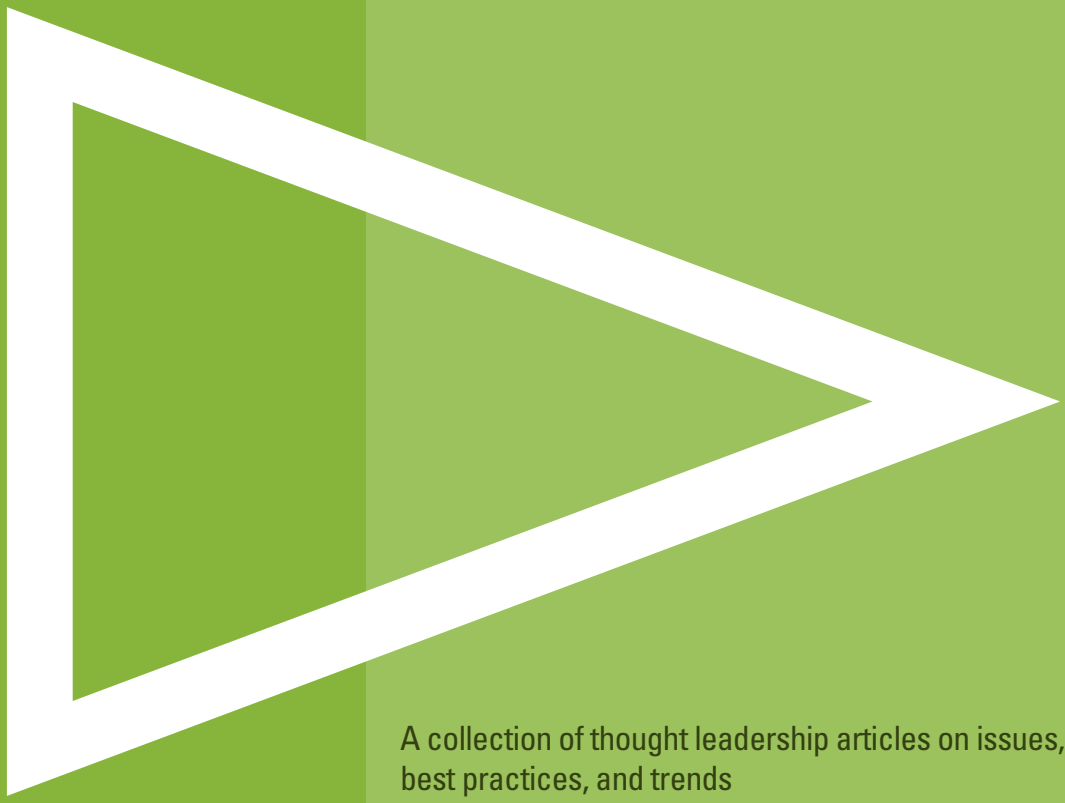
INNOVATION:
THE CONVERGENCE OF INFORMATION TECHNOLOGY AND BUSINESS



A collection of thought leadership articles on issues, best practices, and trends

Manage IT from a Business Perspective — Business Service Management • IT Infrastructure Library (ITIL®) Best Practices • Compliance, Risk Reduction, and Security • Infrastructure Operations and Management • Virtualization • Service Support • Applications Development, Support, and Performance

DRIVING INNOVATION

One of the top issues facing CIOs and their teams is the need to drive innovation while cutting IT costs and increasing business agility. That's why it's so important to follow best-practice frameworks, such as the IT Infrastructure Library (ITIL®), and put more focus on managing IT from a business perspective, which is known as Business Service Management (BSM). With the right people and processes — and the right technology to help enable those processes — CIOs will be better positioned to meet current and future objectives.

In this book, members of the BMC Software Thought Leadership Council offer guidance on how to tackle IT and business challenges. Council members have been recognized in the industry for their expertise in these important areas. In some cases, we've teamed council members with analysts, outside industry experts, and partners to provide an even broader perspective on key issues.

Our objective is to stimulate industry thinking about ways that CIOs and their organizations can leverage technology to solve business problems. Automating best-practice IT and business processes through technology, for example, enables CIOs to increase service quality and lower IT costs so they can focus more of their resources on more innovative, strategic projects.

This book concentrates on a number of topics that are critical to CIOs. Several articles describe how to manage IT from a business perspective, and the benefits that this approach can provide. Other articles explain ways to get the most effective results out of applying ITIL best practices and Control Objectives for Information and related Technology (COBIT®). Some authors examine how to use a configuration management database (CMDB) to deliver business value. One author explores the use of an integrated approach, called service request management, to take a service desk to the next level of IT maturity. The book also includes a look at what the mainframe can learn from distributed systems, and an overview of how to address challenges related to virtualization. Finally, this publication contains thought-provoking articles on a variety of additional related subjects.

I hope you enjoy this second edition of *INNOVATION* and find that it provides guidance to make your organization more innovative and effective.

Be sure to visit www.bmc.com/thoughtleadership for more information about white papers, podcasts, articles, and other material.

Tom Bishop
Chief Technology Officer, BMC Software

Managing IT for the Business

By Jim Grant
Senior Vice President and General Manager, Service Management Business Unit, BMC Software

As enterprise requirements for better IT services have skyrocketed, and your infrastructure has become ever more complex, has your response been to add more people? If so, you're not alone. IT organizations have traditionally reacted in this way.

A lack of effective IT processes can hamper the ability of the enterprise to use technology assets to maximize business value.

Clearly, however, throwing more people at the problem hasn't worked. "Keep-the-lights-on" labor expenses today are soaking up budget dollars and valuable resources that should be used for strategic projects. One report estimates that labor can account for about 40 percent of the service delivery cost in most enterprises. Moreover, adding staff has reached a point

of diminishing returns in the face of growing technical complexity and business dependence on reliable service. A lack of effective IT processes can hamper the ability of the enterprise to use technology assets to maximize business value. That's because most downtime costs are from people and process failures. The impact of downtime on the business is huge, ranging from 2 percent of revenues (on average) for major logistics and transportation companies, to 9 percent for big manufacturing firms, and 16 percent for large financial institutions, according to one industry study.

The solution lies in implementing repeatable business processes and automating process workflows to increase IT efficiency and create opportunities for improvement through measurement and adjustment. Related processes — for example, incident resolution, change planning and execution, and the establishment and monitoring of service level agreements — need to interact with each other from a business perspective. And all IT processes need greater visibility and control over the infrastructure itself, not just so they can do a better job of managing technology, but also so they can effectively manage business requirements.

For optimal results, IT decisions and actions across disciplines must be orchestrated around a common view of people, process, and technology dependencies for the business service involved.

The reality is that just managing things well isn't enough anymore. Your processes need to manage the right things well. This concept is often called Business Service Management (BSM), although you may use a different name for it. BSM is transforming IT management by providing a real-time understanding of how business priorities are being supported, or affected by the computing environment, and using that understanding of what is important in the business to strongly influence how technology is deployed and used.

Integration Is the Key

Restoring service after a disruption, fixing recurring problems, planning a change, and optimizing configurations all involve multiple IT disciplines and skill sets. For optimal results, IT decisions and actions across disciplines must be orchestrated around a common view of people, process, and technology dependencies for the business service involved. Point-to-point connections between each and every process and infrastructure tool could allow each process and tool to see data from the other tools. Such an approach, however, would

be prohibitively expensive, not to mention unscalable, and ultimately, unsupportable. Furthermore, it would not provide a holistic picture of how infrastructure components interrelate to support business services.

To get IT disciplines working together for the business, you need a service management architecture that's built for integration. Process integration helps IT specialists understand how what they are working on relates to business services so they can make better infrastructure and IT process decisions based on importance to the business. The heart of that integrating architecture includes a configuration management database (CMDB) that is much more than just an asset repository. A CMDB provides an integration point for different IT Infrastructure Library (ITIL®) processes and infrastructure and service management tools, providing them with:

- Detailed depictions of assets, their configurations, and their relationships, which offer insight into interdependencies among technologies and the business
- The ability to reconcile data from diverse sources, thereby creating a single source of truth
- Federation capabilities to link to other discovery, asset, or configuration data sources that can assist with service management decisions and processes

Our experience with customers shows that while an architecture designed for integration is essential, customers also need a "factory-integrated" approach in terms of individual solutions that support IT disciplines. This translates into modular solutions with "factory-based" integration, so the solutions can be deployed together to create a comprehensive, integrated service management environment. Supportable, scalable integrations enable workflows that cut across IT disciplines, allowing different parts of your IT organization to collaborate in ways that serve the needs of your business and that heretofore were not possible. These workflows should be based on ITIL best practices, but they should go further, providing closed-loop integration between ITIL process workflow and infrastructure management tools, and also ensuring a view to business impact and importance.

To get IT disciplines working together for the business, you need a service management architecture that's built for integration.

Enterprises that are combining an integrated architecture with factory-integrated solutions based on ITIL best-practice processes are enjoying the advantages of predictability and

continuous improvement. Their IT organizations operate using repeatable ways of delivering and supporting services upon which the business can rely. Further, they have the tools and data they need to measure results, identify process weaknesses, and take corrective action to refine those processes. Consequently, the enterprises can continually ratchet up the level of business value they derive from current and new technology assets.

The Bottom Line

Today, the adoption of management frameworks (such as ITIL and Control Objectives for Information and related Technology [COBIT]) and standards (such as the International Organization for Standardization's ISO 20000) is reaching critical mass. Moreover, ITIL is slated to become part of ISO 20000. The reason for the rapid adoption rate is that these standards and best practices have proven their ability to help IT professionals manage IT for the business.

Enterprises that are taking an integrated approach are achieving immediate results. More importantly, they are positioning themselves for long-term benefits. According to Forrester, "By hitting all of the stepping stones toward BSM, Forrester estimates that companies can save as much as a third of their IT operations budget. As 76% of the IT budget goes to operations, firms that implement BSM can potentially save 25% of their overall IT budget."[1]

Uniting proven IT process improvement with an integrated architecture that provides factory-integrated solutions is your starting point for reaching the predictive stage — the stage where you're getting maximum value from your IT assets and putting your IT dollars where they can have the most business impact.

BMC offers solutions for BSM. For more information, visit www.bmc.com/bsm.

1. Peter O'Neill, with Thomas Mendel, Ph.D., and Reedwan Iqbal, "Business Service Management: Early Birds Are Catching The Worm, But IT Still Doesn't Get It," Forrester Research, Inc., February 6, 2007.

About the Author

Jim Grant *is responsible for running the business that drives the concept, strategy, and delivery for Business Service Management (BSM) through his operating divisions and across BMC. The BSM solutions delivered by BMC today lead the industry in their breadth, depth, and integration in enabling BSM. Prior to joining BMC, Grant spent more than 20 years at Hewlett-Packard, where he held key management positions across the functional spectrum, including manufacturing and materials management, product marketing, operations, and general management.*

IT-Related Executive Dashboards:
It's No Longer a Question of *If*

By Tom Bishop
Chief Technology Officer, BMC Software

Ash Arora
Chief Architect, BMC Software

The need for IT-related executive dashboards is clear. These valuable tools provide vital information and insights that bridge the communications gap between IT and the business. As a result, dashboards empower IT to manage the infrastructure from a business perspective. The growing reliance on technology to ensure smooth-running business processes makes this IT-business alignment an essential ingredient for the success of the enterprise.

So the question IT professionals like you are asking today is no longer if they need to implement dashboards. The question is: What is the best way to do so? Our experience shows that the best approach is an incremental one that starts within IT, and then expands outward to support business managers.

The Role of Dashboards

Executive dashboards enable IT to deliver tailored information in a timely manner and in a format that enables managers to make sound business decisions. These powerful tools aggregate and consolidate atomic data into higher-level information on particular business services, such as online order entry or credit application processing. They convert consolidated data into actionable information. They correlate consolidated data across IT processes, such as incident, problem, change, and service level management, to support senior managers whose responsibilities span multiple processes. Most important of all, they facilitate the management of IT from a business perspective.

The Starting Point — The IT Organization

Delivering the right information to the right manager is not an easy task, considering the diversity of information needs within an enterprise. Managers need information targeted to their functional areas. An IT operations manager needs availability and performance data on servers, while a sales manager needs metrics on business processes and business services. Requirements vary, even within functions based on the manager's level and role. The higher the management level, the wider the field of view must be.

Executive dashboards enable IT to deliver tailored information in a timely manner and in a format that enables managers to make sound business decisions.

With this in mind, it's best to take a phased approach that starts with supplying IT managers with a dashboard solution. This approach enables the IT staff to come up to speed on deploying and using dashboards before extending their use to the business audience. It also helps in educating IT on the needs of the business, which helps IT managers communicate more effectively with their counterparts in the business units and do a better job of tailoring dashboards for business people. The rollout in IT involves four key activities:

> *Collecting and consolidating the data.* IT service management applications maintain data on incident, problem, change, release, configuration, and service level management processes. Asset management applications maintain data on asset configurations, owners, locations, physical and logical topologies, costs, and associated contracts (such as lease, support, and maintenance). A dashboard solution aggregates and correlates the data from all these sources for presentation in a single view.

- *Making the data actionable.* The dashboard must transform the consolidated data into metrics that are appropriate, meaningful, and actionable. To achieve this, you must establish key performance indicators (KPIs) defining what to measure, how to measure it, and how to communicate it. Presenting actionable information in a composite view that spans multiple processes permits integrated management across disciplines and operational silos.
- *Relating IT to business services.* Service impact modeling solutions map relationships between the IT infrastructure and the business. Executive dashboards can leverage this mapping to help IT managers understand how the infrastructure supports business services. By monitoring process-centric and cross-functional KPIs that affect the business, IT managers can more closely align IT with business objectives.
- *Targeting information based on role.* Information needs differ depending on role and management level. The dashboard system must accommodate this need by allowing the creation of personalized views that are appropriate to each manager's role and level within the management hierarchy. That means the right field of view, the right metrics, and the right level of detail.

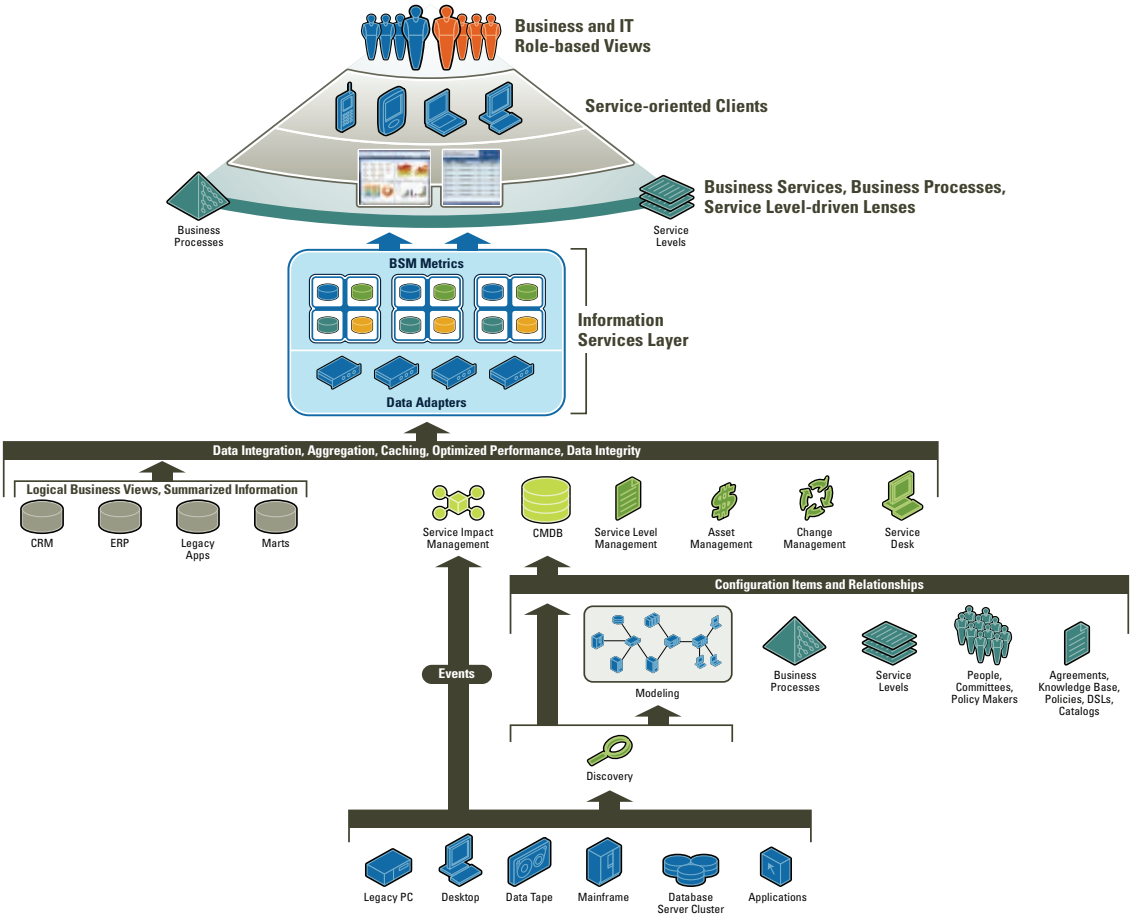
Managers need information targeted to their functional areas. An IT operations manager needs availability and performance data on servers, while a sales manager needs metrics on business processes and business services.

The Next Steps

With dashboards in place for IT, the next step is to extend them to business managers. For this audience, dashboards must present metrics based on business processes as well as on business services. For example, a bank manager sees an online consumer loan application process as a collection of business services: online application entry, credit check, automatic approval routing, and automatic deposit. The dashboard view must include this business process information.

Today's methodologies and solutions can capture business process information and maintain it in a configuration management database (CMDB). Automatic discovery solutions discover information from business process management systems and add it to the CMDB as configuration items, along with descriptions of the activities that make up the processes. With this information in the CMDB, it's possible to map the relationships of IT infrastructure

components to business services to business processes. This provides a wealth of new data for creating business process-oriented dashboards that combine IT-related data with business process data.



Adding business process and service level-driven clients

By leveraging business process data, dashboards can correlate IT service delivery with business processes. For example, a dashboard can present the overall performance and availability of an entire online consumer loan application process, tying together all the services that support the process and displaying service support and service delivery metrics in the context of these services. This view of IT service delivery greatly enhances the usefulness of dashboards. It not only permits the extension of dashboards to business managers but also promotes business services-based thinking on the part of IT managers.

As in the case of IT managers, the major challenge in creating dashboards for business managers is to establish the right metrics — the key business indicators (KBIs) these people need to manage their portion of the business effectively. Tying business metrics to IT-related metrics requires close collaboration between IT and business managers. For example, for a sales executive, the end of each quarter is a critical period for closing deals. IT and sales must agree on acceptable service levels during that period, and IT must ensure that those service levels are met. The dashboard supports this effort by permitting sales executives to monitor KBIs, and to understand how they might affect the ability to close deals during this critical period. This requires correlation of the sales manager's KBIs with metrics that indicate the efficiency and effectiveness of IT in supporting the relevant business services.

The value that IT-related executive dashboards deliver makes them well worth the investment of time, money, and other resources required to deploy them. The easiest and best way to bring dashboards to your enterprise is to take a phased approach that starts within the IT organizations. With such an approach, you can begin enjoying the benefits these tools offer in a relatively short time frame. Then, over time, you can extend their use to a broader audience, which will result in enhanced business agility, higher-quality IT business services, and lower IT costs.

For more information on BMC® Dashboards for BSM, visit www.bmc.com/dashboards.

About the Author

Tom Bishop *is the chief technology officer of BMC. He was named one of the top 25 CTOs by* InfoWorld *magazine in 2004. He is a well-known industry innovator who holds nine patents in fault-tolerant computing and leads the development of industry standards, such as the Distributed Management Task Force (DMTF) and POSIX.*

About the Author

Ash Arora *is chief architect at BMC. His charter at BMC is to develop innovative, BSM-focused products. Currently, he is spearheading the BSM dashboards, which offer a next-generation experience and access to BSM performance indicators. Before joining BMC, he co-founded Vincera Software, a Business Activity Monitoring (BAM) company. Prior to that business venture, he architected a pivotal large-scale, business-critical solution called Display Book for the New York Stock Exchange (NYSE).*

The Business Service:
The Lingua Franca Connecting IT and the Business

By Mary Nugent
Vice President, Software Consulting, BMC Software

Dr. Thomas Struck
Consulting Manager, Business Process Management, IDS Scheer

For years, differences in the way IT and business have viewed the IT infrastructure have made it almost impossible for these two groups to communicate effectively. IT staff traditionally have looked at the infrastructure from the inside out — from the perspective of the hardware and software components that provide services to the business. Line of business managers see that same infrastructure from the outside in, as a collection of services that support business processes. This disparity threatens business success because it prevents companies from unleashing the power of technology to enhance efficiency, gain a competitive advantage, and drive business goals.

Fortunately, new solutions are paving the way for a lingua franca, defined as any language widely used beyond the population of its native speakers. In this case, it is a common language that promotes effective dialog between IT and business owners. The solutions give business owners a better understanding of the IT environment, and give the IT staff a better understanding of the business. A major European bank used such solutions to reduce its online credit application lifecycle processing to 30 minutes — giving the bank a competitive edge in an environment where the average processing time is two hours. A large manufacturing firm used them to increase the availability of key revenue and customer satisfaction business services that support the sales process. The good news is that with the right approach, business managers can communicate and collaborate more effectively, enabling companies to leverage technology to achieve success.

Evolution Toward a Common Language

For years, IT service management solution vendors have been working from the bottom up to develop tools that improve service management and enable IT to align the infrastructure more closely with the business. Likewise, the business side has been evolving business process management (BPM) tools from the top down.

This disparity threatens business success because it prevents companies from unleashing the power of technology to enhance efficiency, gain a competitive advantage, and drive business goals.

On the IT side, three technologies are fundamental in this evolution: the configuration management database (CMDB), automatic discovery, and service impact modeling. The CMDB maintains information about technology assets, IT processes, and people, as well as descriptions, such as hardware and software configurations. One of the most important functions of the CMDB is to maintain the physical and logical relationships of infrastructure components — to each other and to the business services they support.

Automatic discovery solutions have evolved to discover not only hardware and software resources, but also the relationships among IT assets. Consequently, IT professionals have visibility into the physical dependencies of assets, which helps them understand the impact that assets have on each other. Today's solutions can also discover the logical relationships of the assets, providing insight into the impact of physical assets on the logical assets they support.

Service impact modeling solutions are driving even greater progress by enabling IT to create and maintain models that map infrastructure components to business services. These models help IT view the infrastructure from a business service perspective.

With IT specialists working their way up, and business process engineers working their way down, it was only natural that at some point they would find a common language that allows clear communication. That lingua franca is the IT business service.

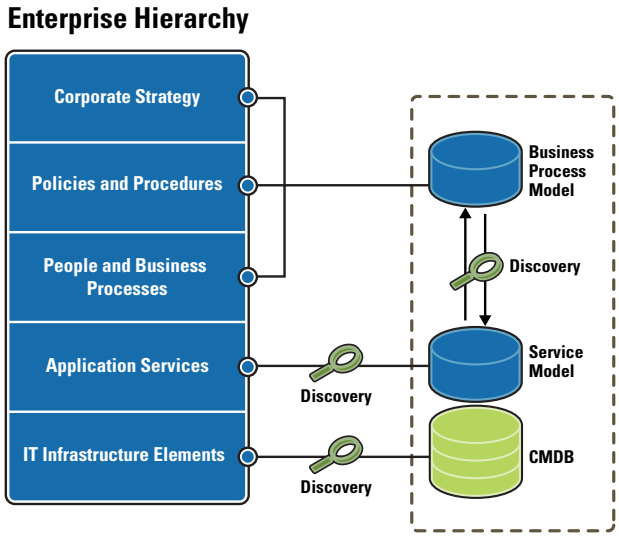
On the business side, business process engineers have been developing methodologies, platforms, and solutions that help them model business processes. This provides an enterprisewide view of business processes, enabling companies to:

- Define all business processes and show all activities involved
- Define the relationships among processes
- Reuse process definitions, creating larger processes by combining smaller ones and sharing processes across functional units
- Define the relationships of the processes to IT business services

This enterprisewide view enhances the ability to execute on strategy because it makes it possible to incorporate strategic goals into business process models for more informed decision-making. It increases business agility, enabling you to adapt swiftly to changing business requirements. The view allows you to reassess and realign processes on an ongoing basis to continually optimize process effectiveness and efficiency. Finally, it provides insight into the cost implications of processes by detailing the activities that constitute a process and the IT business services required to support it.

Creating a Common Language

With IT specialists working their way up, and business process engineers working their way down, it was only natural that at some point they would find a common language that allows clear communication. That lingua franca is the IT business service. BPM tools map business processes to the underlying IT business services. IT service impact modeling tools map the underlying infrastructure to the business services it supports.



Discovering the IT environment

Because IT business services are a point of commonality, they provide a point of integration between BPM and IT service management applications. Two key technologies — the CMDB and autodiscovery tools — have been extended to accomplish the integration.

A well-designed CMDB provides the foundation for integration. It accommodates the addition of business processes as configuration items, along with descriptions of the activities that make up the processes. It maintains information on all business processes, including their relationships to each other and to the IT business services that support them. Mapping business processes to IT business services opens the door to further mapping business processes to the underlying infrastructure using the service impact model information in the CMDB. Advanced discovery tools seek out information from BPM tools and maintain it in the CMDB.

From a business perspective, the integration of BPM and IT service management applications opens the door to communication between IT and business owners. Integration gives IT a full understanding of all business processes, and not just those supported by IT business

services. Consequently, IT and business owners can collaborate to extend the use of technology to other processes. For example, the IT staff may see a manual business process that can be automated to enhance performance of a customer service while also reducing the cost of delivering that service.

Integration of BPM and IT service management applications provides an enterprisewide view of business processes mapped to the IT infrastructure. As a result, IT and business managers have a common language for communication and collaboration. The business benefits are compelling and include enhanced business agility, improved business and support services, reduced risk, enhanced ability to achieve and demonstrate regulatory compliance, and lower costs.

For more information about solutions that address these issues, visit www.bmc.com and www.ids-scheer.com.

About the Author

Mary Nugent, *vice president, Software Consulting, BMC, is an accomplished software technology executive with considerable experience and expertise in information technology. She is responsible for the development of projects around Business Service Management (BSM) for BMC.*

About the Author

Dr. Thomas Struck, *consulting manager, Business Process Management, IDS Scheer (www.ids-scheer.com), is an expert BPM consultant with considerable international experience in industry. He is responsible for the development of projects around BPM for ARIS.*

A Few Thoughts on Eastern Philosophies, Inner Peace, and Process-Optimized IT

By Peter Armstrong
Corporate Strategist, BMC Software

The Buddhists call it nirvana. A state of great inner peace and contentment. For IT professionals like you, nirvana could be a world in which all your IT processes are optimized. Just imagine...

Your service desk prioritizes activities based on the severity or urgency of business impact. An early warning system sifts through raw event data and generates intelligent incident tickets with rich contextual information that permits proactive and speedy resolution of incidents and problems. As change requests come in, your data center staff has only to categorize them. The system does the rest, automatically staging changes according to business priority, and implementing them according to policy and with best-practice processes. The operations team keeps every server and client machine humming, effort-

lessly rolling out software patches and updates. And, as employees come on board or change roles, automatic provisioning ensures their client machines are immediately deployed with software and access privileges appropriate to their roles.

If that world seems like a distant dream, take heart. Getting there may not be as difficult as you imagine.

Starting Your Journey

According to Chinese philosopher Lao Tzu, "the journey of a thousand miles starts with a single step." In the case of transitioning to a process-optimized world, that step involves transitioning to a business process-oriented view of the world, a view that transcends IT processes. To do so, you need to establish two capabilities.

First, you need to develop clear insight into the relationships between the IT environment — IT infrastructure resources and IT processes — and the business processes supported by that environment. Second, you need to tie together IT processes and task sequences across IT Infrastructure Library (ITIL®) disciplines to enable workflow at a business process level. This eliminates the process and tool silos that hamper your efforts at running IT like a business.

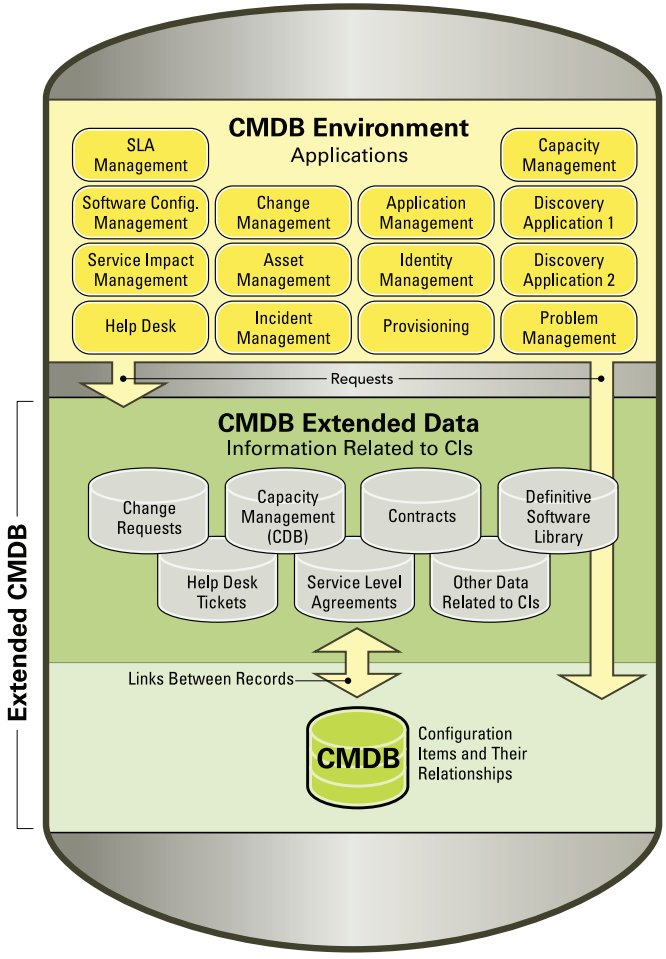
A business-aware foundation provides the translation between the IT environment and the business services it delivers, permitting you to make the transition from an IT-centric to a business-centric view of your world.

However, IT processes and the IT environment are complex. So, taking that first step requires a well-designed, systems-based solution that:

> Provides a business-aware foundation

> Integrates and automates IT processes both within and across IT disciplines

The good news is that you can start on your journey right away because IT service management solutions that do both are available today.



Recommended CMDB infrastructure with federated data model

A Business-aware Foundation

A business-aware foundation provides the translation between the IT environment and the business services it delivers, permitting you to make the transition from an IT-centric to a business-centric view of your world. A configuration management database (CMDB) makes an excellent business-aware foundation. The CMDB can relate IT resources to business services, so it can act as a central hub for aligning IT processes with the business. That's

not all. The CMDB is a fundamental component of the ITIL framework, which has become the de facto standard framework for IT processes and is the basis of a new major international standard, ISO 20000.

If the thought of implementing something as seemingly complex as a CMDB disturbs your inner peace, you can stop worrying. A well-architected CMDB facilitates its own implementation. For example, it can populate itself using autodiscovery tools, identifying not only all hardware and software assets and their configurations, but also their physical and logical interdependencies, as well as their relationships to business services. What's more, these tools can keep a watchful eye on the IT environment to keep the CMDB updated.

The CMDB provides another essential function. It acts as a central point for access to comprehensive information about the IT environment. That doesn't mean, however, that you have to store all that information in a monolithic, unwieldy database. If you choose a CMDB built on a federated data model, you can create a single, logical data store that includes data residing on multiple data sources, yet makes the remote data an integral part of the CMDB. You don't have to move or replicate data to make it part of the CMDB repository.

Process Integration

Business processes typically span multiple IT processes, so to enable workflow at the business process level, it is essential to integrate IT processes both within and across IT disciplines. This integration is a key facet of ITIL. As a result, a systems-based solution must span all ITIL service management disciplines, and support process integration among them. True process integration requires that solution components integrate at the data level and the application level.

The CMDB offers an attractive foundation for process integration. It serves as a single source of truth, providing a point of integration and synchronization between different ITIL management processes, all of which contribute and consume CMDB information.

An example of the integration of change management and release management processes illustrates the power that integration delivers. The change management component automatically triggers the release management component to implement a software change through application integration, and it orchestrates that change by passing relevant details to release management through data integration. Release management implements the change, all the while keeping change management informed of the status of the request.

Because the two components share the CMDB, release management executes precisely what has been approved in change management.

A comprehensive change and release management solution will also include a Definitive Software Library (DSL). The DSL provides consistent, normalized software descriptions and links to your golden master software. The DSL maintains consistency among change, asset, and policy-based software release management tools to ensure that only the latest versions of authorized, licensed software are deployed.

The CMDB offers an attractive foundation for process integration. It serves as a single source of truth, providing a point of integration and synchronization between different ITIL management processes, all of which contribute and consume CMDB information.

Does this kind of integration bring up frightening visions of long and expensive custom development? Here again, a well-designed solution can dissipate these images. Out-of-the-box integration among solution applications, as well as integration of applications with a CMDB and DSL, facilitates implementation and ensures that the solution starts delivering value quickly. Modularity lets you make incremental progress, adding components and moving at the pace best suited to your organization. Finally, an open architecture means the solution can consume data from — and contribute data to — other applications that you may already have in place, leveraging your investment in these applications.

By optimizing your IT processes based on business implications and priorities, you can replace today's pressure-filled IT world with a world of much greater peace and tranquility. Systems are available today to help you along your journey. It's a journey that is well worth the effort — one that offers many rewards along the way, including reduced risk, enhanced ability to achieve regulatory compliance, increased productivity, and dramatically improved service to your business users.

For more information about BMC solutions, visit www.bmc.com/itil and www.bmc.com/atrium.

About the Author

Peter Armstrong, *corporate strategist for BMC, is responsible for the increasingly important domain of how business and information technology need to work together. Armstrong has helped to develop the Business Service Management (BSM) approach introduced by BMC. He works closely with the company's development labs to keep developers informed on customer plans and activities, particularly in the non-U.S. marketplace, thus helping to ensure that the solutions BMC delivers are pertinent worldwide.*

ITIL:
Setting the Stage for Versatility

By Atwell Williams
Solutions Architect, Office of the CTO, BMC Software

The performance of a well-tuned IT organization is much like the performance of a group of talented improvisational musicians. Both rely on an underlying structure to enable the versatility necessary for stellar performances in the moment. Although musical improvisation might sound free-form and unstructured, a central theme runs through each improvised set. Each musician in the group understands the theme, knows how to build upon it, and improvises a spontaneous creation that conforms to the musical structure. The result is freedom of expression or versatility for the performers and enjoyment for the audience.

IT process management can follow the example of musical improvisation. You want an enjoyable experience for both your performers (IT) and audience (the business users), but you realize that each has unique needs for interpretation, expression, and a good

experience. This is where the IT Infrastructure Library (ITIL®) best-practice processes can be music to your ears. ITIL processes can help align your infrastructure's technology with business objectives, and define the theme to which your enterprise plays.

Making Music

ITIL defines best-practice processes for change management, incident management, problem management, and capacity management, among others, to help the business achieve quality IT services while also reducing costs in technology operations. Because ITIL processes are guidelines, not standards, they can be creatively and flexibly applied, helping you respond to problem areas effectively and on many levels. This is particularly important during times of crisis when, in the absence of standardized processes for your infrastructure, you would need to determine how to resolve a situation each time it occurred.

ITIL processes can define how to quickly respond to situations related to service support and service delivery, and the processes can help IT organizations to understand how other groups work, so everyone supports the same musical theme. That's structure. At the same time, a versatile IT organization is one that can quickly adapt and respond to continually changing needs of the business. That's improvisation. An organization that adopts ITIL as a framework provides a structure for people to more flexibly and "improvisationally" support the enterprise.

ITIL defines best-practice processes for change management, incident management, problem management, and capacity management, among others, to help the business achieve quality IT services while also reducing costs in technology operations.

If you're a CIO, your responsibility is to deliver consistently appropriate levels of service at optimal cost. To maintain those service levels, changes (such as patches or enhancements) must inevitably be introduced. If you introduce change without a process in place, it can jeopardize your service levels. If you have an overly rigid, structured process through which everything must flow, it might be more effort than some situations require.

You need the versatility to respond to situations requiring change through a universally applicable process. ITIL change management explains how to handle all changes in your environment — whether minor, significant, or emergency changes. ITIL change management

procedures provide a framework to implement any change that comes your way — and give you versatility in how you respond to any given situation.

Consider, for example, that Microsoft releases a patch that identifies a new vulnerability. The patch must quickly be deployed, but an impromptu approach could jeopardize service levels. Without a predefined change deployment process in place, a group will likely need to be assembled to decide how the patch will be deployed. Meanwhile, the vulnerability remains and the enterprise is subject to attack. The drain on resources as the group determines how to proceed can further jeopardize your service levels. At the same time, if you plow ahead and issue the patch across the enterprise without appropriate testing, you could create more problems than you prevent.

ITIL change management procedures provide a framework to implement any change that comes your way — and give you versatility in how you respond to any given situation.

A change management process based on ITIL guidelines helps alleviate this situation by providing a framework for dealing with ad hoc, emergency changes. With a structured ITIL approach in place — one that plays to the theme of your enterprise — you could respond to this and other change scenarios quickly and effectively. You're much more likely to achieve consistent, cost-effective levels of service if you have the proper structure in place for change management. While some might argue that there is more versatility without structure, think back to the group of improvising musicians. If you're not playing in the same key, it's just noise.

Versatility when resolving incidents is a vital consideration for IT organizations. You must be able to respond to incidents based on the ever-changing needs of the business. The ITIL incident management process provides guidelines for assuring that versatility through a structured prioritization activity.

If an incident occurs, and if there is no process for prioritizing this incident in relation to the other incidents that are currently being handled, service can be disrupted. Human nature is to respond first to the incident that was reported first, and the priority for incident resolution thus becomes first-in/first-out. On the other hand, in some cases, prioritizing incident resolution might rely on the service desk technician's instinct to gauge one incident as being

higher priority than another — but would the business agree with the technician's decision? In the absence of a process that enables IT to categorize and prioritize incidents based on *the business impact of the event*, it's a free-for-all at the service desk. Without the right incident management structure and process in place, incident resolution most likely will not be in "concert" with the needs of the business.

Setting Priorities — The Key to Easy Listening

Consider, for example, that an incident at a banking institution causes ATMs to fail, and at the same time, in a separate incident, the systems fail at the bank's branches. Both incidents are recorded in the operations center, virtually simultaneously. In the absence of guidelines for prioritizing incidents, the service desk cannot reliably determine which incident should be resolved first. Should the ATMs be restored first, or is it more important to get the branches back online?

In the absence of a process that enables IT to categorize and prioritize incidents based on the business impact of the event, it's a free-for-all at the service desk.

The answer depends on the priority of the incident *as viewed by the business*. IT needs the versatility to shift its incident resolution efforts and focus based on which incident is considered higher priority by the business — the failed ATMs or the bank branch system failure. ITIL defines priority as the combination of impact and urgency. While the bank branches being offline may be of greater impact, that problem is only half of the equation. What if these incidents occurred on a federal holiday, when the banks are closed? Although the impact of the incident is still the same (that is, the branches are still down), the urgency is low, since no one is trying to use the systems in the branches. Conversely, the failed ATMs, while perhaps having a lower impact, have a much higher urgency since that's the only means for people to withdraw cash. As a result of assessing both impact and urgency, resolving the incident that resulted in the ATMs being down would be given a higher priority over the incident that impacted the branches. The versatility created by the structured ITIL process results in the lyrical sound of cash once again being dispensed.

The structure of ITIL can also improve your IT organization's versatility in responding to the continually changing demands for scarce computing resources. Imagine that your business customer plans to launch a marketing campaign that will increase revenue but will also

increase the traffic to your Web storefront. In the absence of a structured approach to assessing and providing for capacity needs, companies frequently are either caught off guard or overprovision their infrastructure. Applying the ITIL capacity management principles of business, service, and resource capacity management, as well as demand management, provides IT organizations with the versatility to respond to the needs of the business, while doing so in the most cost-effective manner.

For more information on ITIL, visit www.bmc.com/itil.

Framework for Freedom

ITIL process management techniques can form the framework of your enterprise, giving both IT and the business the versatility and expression they need. Together, you and ITIL can make beautiful music.

About the Author

Atwell Williams, *solutions architect, Office of the CTO, BMC, has served as an ITIL instructor for the BMC Business School and is certified in the following ITIL areas: ITIL foundation, practitioner, and service manager. He was director of IT Service Management, responsible for assuring the overall performance, availability, security, and recoverability of BMC internal production applications. Prior to joining BMC, Williams was a partner with PricewaterhouseCoopers (PwC), were he spent 13 years focused on delivering IT infrastructure and process design and development services to PwC's numerous clients.*

Identity Management: Bringing the People Component to ITIL

By Rami Elron
Identity Management Worldwide Enablement Manager, BMC Software

Ken Turbitt
Global Best Practices Director, BMC Software

Christopher Williams
Identity Management Consultant

The number of companies adopting IT Infrastructure Library (ITIL®) guidelines continues to grow as business leaders recognize the value of using best practices to improve IT service levels, reduce costs, increase business agility, and demonstrate regulatory compliance. ITIL speaks to a broad range of IT disciplines, including incident, problem, change, release, and configuration management, as well as IT service continuity and security management.

The latest release of ITIL, version 3, now has security and access management, which reflects identity management activities and processes. It focuses on the people component of the IT environment. As a result, many practices within identity management intersect directly with ITIL disciplines. This level of synergy is undeniably strong. Identity management solutions maintain comprehensive information about users, which can be leveraged to support ITIL processes. Organizations that integrate identity management solutions with applications to support ITIL processes are finding that ITIL best practices are easier to implement. They are also discovering that the resulting environment delivers far greater efficiency than would be possible without this integration.

What Identity Management Brings to the Table

An identity management system manages the entire lifecycle of digital identities and maintains a wealth of user information — the user's role in the enterprise, access privileges to enterprise applications, authentication data, and more. Through such a system, IT can implement, enforce, and audit identity-related procedures in accordance with business policies. That aligns directly with the central role of ITIL, which is to provide greater efficiency through standardization of process and nomenclature.

Organizations that integrate identity management solutions with applications to support ITIL processes are finding that ITIL best practices are easier to implement. They are also discovering that the resulting environment delivers far greater efficiency than would be possible without this integration.

Identity management and ITIL disciplines are tightly intertwined. Their relationship is especially evident in change management and the related release and configuration management disciplines. To understand this concept, let's look at the intersection of identity management with change, release, and configuration processes.

Incorporating Best Practices

Improperly planned or poorly executed changes cause disastrous system outages in many organizations. Improperly planned changes can also lead to noncompliance with government mandates. To prevent this, businesses must implement and enforce best-practice processes for change, release, and configuration management. Identity information is a necessary ingredient for each.

It is an important imperative to ensure that only authorized people approve and implement changes, and that people approve and implement only those changes for which they are authorized. Change privileges are based on an employee's role — and it's the identity management system that maintains role information. The change management application can use role information to determine who is authorized to approve and implement changes. It can also use the information to create an audit trail that indicates who approved each change and when, as well as who implemented each change and when. This auditing capability enables accurate and timely regulatory compliance reporting.

Identity information also gives the change management team visibility into who uses which applications. With this insight, the team can easily determine who will be affected by planned changes to critical business applications, notify them in advance, and keep them informed of change status.

Change privileges are based on an employee's role — and it's the identity management system that maintains role information.

Finally, identity information enables the configuration management application to ensure that only standard configurations, based on employee roles, are deployed in client machines. Operating in concert with automatic discovery tools, the configuration management application can determine the configurations of client machines and compare them with standard configurations to uncover inconsistencies. The application can also restore the offending machines to standard configurations by triggering the change management application to reprovision the machines with the appropriate software.

Facilitating Automatic Provisioning

The user base in most organizations changes continually as employees come on board, change roles, and leave. In response, IT must provision new and reassigned employees with properly configured client computers and appropriate access to enterprise applications, and must also deprovision terminated employees. In a large organization, the number of changes each day can be in the thousands. By integrating identity management with ITIL change and release processes, the IT organization can automate provisioning, saving valuable staff time and ensuring greater accuracy.

Here's an example of an automated approach: The entry of a new employee record in the human resources (HR) system is detected by the identity management system, which, based on configurable policies, determines the appropriate employee data, including role and group membership, and adds it to the identity database. The identity management system subsequently provisions user account data (corresponding to the new employee) to each system. This is where the employee may be granted access rights, and the change management system is triggered to initiate change processes associated with the event. The change management application, in concert with the release management application, allocates and provisions a client computer with the appropriate software and access to applications. Corporate policies based on the employee's role in the enterprise guide the provisioning task.

By integrating identity management with ITIL change and release processes, the IT organization can automate provisioning, saving valuable staff time and ensuring greater accuracy.

Likewise, when an employee is reassigned or leaves the company, an update to the HR system is detected by the identity management system. This system, which is based on configurable policies, determines how to deprovision employee-related data. As a result, the employee's ability to gain access to system resources is disabled. Additionally, the identity management system prompts the change management application to initiate any actions determined relevant to this event.

Visit www.bmc.com/idm for more information.

Final Thoughts

While ITIL does not specifically address identity management, ITIL processes and identity management are tightly intertwined. Integrating an identity management solution with ITIL process management applications leverages the strong synergy between them. The result is increased process automation and effectiveness, which delivers business benefits well beyond those that ITIL process management applications and the identity management solution could deliver individually.

About the Author

Rami Elron, *identity management worldwide enablement manager, BMC, is responsible for design aspects of the BMC Identity Management solution, including the solution's next-generation architecture and features.*

About the Author

Ken Turbitt *is the global best practices director for BMC. He is focused on best practices for IT services, such as ITIL, COBIT, and eTom, among others, and presents this information to clients, partners, and analysts. Turbitt has held an ISEB ITIL Manager/Masters qualification for more than 12 years and has been a Gartner-qualified TCO consultant for more than 10 years.*

About the Author

Christopher Williams, *identity management consultant, has been associated with IT organizations for the past 25 years in a variety of industries. He currently works with consulting firms on ITIL-related computing disciplines.*

How Non-technical People Can Benefit from ITIL Training:
Learn to Manage IT from a Business Perspective

By Linda Donovan
Senior Strategic Marketing Manager, Thought Leadership Council, BMC Software

Although I write about technology for a living, I must confess that my background is non-technical. Just the thought of taking a mathematics or science class in college sent me into a state of panic because only my right brain functions 24x7. Still, I decided that if I wanted to continue to work on projects about the IT Infrastructure Library (ITIL®), I should face the music and take an ITIL foundation class to get ITIL certified.

I signed up for an ITIL foundation course offered by BMC. That decision was one of the best I made. Added good news was that the course did not have anything to do with science, and I could delegate any math activity to math wizards in my class. It turned out that this was really a business class highlighting the value of doing the right things for the business.

We learned that business cannot survive on the strength of good people alone. People, processes, and technology need to be aligned to the business goals. Our goal was to run a profitable airport.

The class was a three-day overview of ITIL processes, exercises related to Business Service Management (BSM), and a final test on content. My favorite activity was the BSM Airport Simulation exercise. This activity gave us a chance to understand what it really means to implement BSM, which means that the goals of IT are the same as the goals of the business. ITIL is at the heart of the BSM approach to managing IT from a business perspective. During this exercise, we monitored onscreen (with updates every few seconds) how much money our airport was making or losing based on decisions we made related to IT. Here are some of the highlights and lessons learned.

Our class of about ten people was divided into groups of people from IT and the business, where we each assumed different roles. Our job was to solve IT problems effectively so that flights could take off on time and our airport could make money. If we didn't have adequate processes in place, and if we failed to ask the right questions, we would lose money.

We learned that business cannot survive on the strength of good people alone. People, processes, and technology need to be aligned to the business goals.

Ironically, I was assigned to work with two other people as a technical services expert. It was not unusual to have three or four problems hit us at the same time, but we had a "budget" to hire consultants if we knew that we needed assistance.

A classmate assigned to the service desk would send my team a trouble ticket. We then looked up information in relevant class guidebooks and applied our newly learned skills of ITIL processes to find the right question and solve Mensa-like math problems to get the answers needed for closing trouble tickets. I immediately knew I wasn't going to be much help in the math area, so I took on the role of project manager and worked as a liaison for the help desk, business customer, and the person assigned to financing IT projects.

Overcoming Obstacles with BSM

We failed miserably the first round and shut down the airport. In fact, by the second round, our cumulative loss was nearly $250,000, our mean time to repair (MTTR) was more than 16 minutes per problem, and availability was less than 45 percent.

What happened? For starters, we didn't talk to the business. We thought we were working on solving the right problems, only to learn that we sometimes asked the wrong questions. We were handling tickets as they came in, and they were not always based on business priority. For example, we treated the airport terminal's catering availability with almost the same sense of urgency as a threat to the control tower. *What were we thinking?* We didn't hire consultants when we should have. And, we didn't always keep the help desk informed of ticket status. With each mistake, we could see how much it was costing the company.

By round three we had the system processes working correctly and more than made up for losses, *with a cumulative profit of $108,000.* Our revenue jumped from a low of $9,600 in round one to $459,000 in round three. Availability jumped to 83 percent. Per problem, the MTTR dropped from 16 minutes to just 3 minutes and 30 seconds. In the first round, only eleven flights were able to take off; we got that number up to 55 by round three.

What Did We Do Differently in the Third Round?

First, in our strategy session before the third round started, we made sure that our processes and technology implementations were effective and understood by everyone. You learn this in ITIL training. Then we set up a clear communications strategy and defined how events would be prioritized and efficiently communicated — more ITIL basics.

Most importantly, we learned to make sure that we always understood the reported problem before we generated an answer. Each time we thought we had identified the problem, I asked the person assigned to be the "business" to confirm that we really were working on the correct request. There's no point in solving a problem if you solve the wrong one. As obvious as this seems, we, like many real IT organizations, hadn't always first checked with the business, hadn't asked the right questions, and consequently sometimes solved the wrong problems.

Just as ITIL recommends, we paid close attention to working toward business priorities instead of only IT priorities, and very quickly assessed which problems we could solve in-house immediately and which ones needed to be outsourced. We also collected a knowledgebase of answers, so that if we were asked the same question more than once we would be able to expedite an answer.

We finally got the "ah ha" moment and started to understand the value of people, process, technology, and supplier alignment to achieve business objectives. We felt the pain of what happens when IT is not aligned with the business, and we experienced the benefits of BSM nirvana. Had we gone a few more rounds, I know we would have added even more value to the business.

Most importantly, we learned to make sure that we always understood the reported problem before we generated an answer.

I recommend the BMC-sponsored ITIL foundation course with the BSM Airport Simulation to anyone interested in learning more about ITIL. The instructors are excellent and the workshop provides a good overview of ITIL and how it can help you manage IT from a business perspective.

For more information on where this course is offered, visit www.bmc.com/education and click on your country.

About the Author

Linda Donovan, *senior strategic marketing manager at BMC, leads the BMC Thought Leadership Council. She works with industry experts to provide commentary, analysis, and insight for IT and business executives and their teams. She has broad experience in the enterprise management and aerospace industries and has taught communications at several universities.*

The CMDB:
Building the Right Foundation to Deliver Business Value

By Kia Behnia
Chief Corporate Architect, Office of the CTO, BMC Software

Few IT professionals would argue that traditional IT management practices are adequate for today's fast-moving business environment and complex IT infrastructures. That's why so many organizations are moving aggressively to replace outdated, manual processes with proven best-practice processes outlined in process, control, and quality frameworks, such as the IT Infrastructure Library (ITIL®) and Control Objectives for Information and related Technology (COBIT).

To ensure that such frameworks deliver the desired business benefits, however, you need to implement a systems-based solution that supports the processes and controls necessary to manage a complex and continually changing IT environment. To be effective, the solution must be based on a top-down IT management architecture that defines such factors as the parts required, the functions of each part, the interrelationships among them, and the interfaces that unite the parts to create a seamless environment. A configuration management database (CMDB) and automated discovery tools are core components of this architectural foundation.

A CMDB is vital because of its role in capturing and maintaining comprehensive information that describes the IT environment.

Taking a Systems-based Approach

To enable a business-aligned IT environment, your underlying architecture has to provide a complete, accurate, and up-to-date view of the people, processes, and technologies that make up the business and IT environment. That involves consolidating silos of data into an enterprisewide view that shows not only infrastructure components and their physical and logical relationships, but also the relationships of the components to business services. The architecture also must integrate IT management processes across disciplines and technology silos. This involves integration of the technologies, applications, and tools that support the processes. The combination of a CMDB and automated discovery tools that populate it and keep it up to date offers a relatively fast and effective means of building such a foundation. In fact, these two capabilities are essential to creating a business-aligned IT infrastructure.

A CMDB is vital because of its role in capturing and maintaining comprehensive information that describes the IT environment. The information encompasses configuration items (CIs), including the technology assets, IT processes, and people; CI descriptions, such as the configurations of client and server machines; and CI relationships, such as the physical and logical relationships of applications, application servers, database servers, and networking elements. A well-architected CMDB provides an integration point for IT management silos. It is a key component of ITIL in that it brings IT processes and technology management together, permitting more effective execution of IT processes. Finally, it provides a single source of truth that all ITIL processes can share.

Reaping the Rewards

If you are concerned about the investment of time and money required to implement a CMDB and automated discovery, take heart. While such an implementation is substantial, so is the payoff. A number of business benefits help ensure that you realize a solid return on your investment. They include:

- *Stronger IT/business alignment.* Insight into the relationship of the IT infrastructure to business services and processes enables you to understand the impact of IT on the business and vice versa. Consequently, you make decisions and take action based on business impact, which translates into better services to end users and customers.
- *Increased operational efficiency.* The physical and logical topology information maintained by the CMDB improves IT staff efficiency. In addition, business service and business process information permits you to prioritize activities based on business impact. As a result, you can focus on those activities most important to the business, maximizing efficiency.
- *Enhanced regulatory compliance.* The CMDB maintains the relationships of the components of the IT environment and IT processes to the business processes they support. Compliance assessment applications can leverage this information to measure compliance of business processes, and audit reporting applications can tap into it to provide required audit trails.
- *Fewer change-related business disruptions.* The change management team can leverage physical and logical dependency information in the CMDB to assess change risk and understand the impact that changing one IT infrastructure component will have on other components. The mapping of the IT infrastructure to business services and business processes helps the team minimize the impact of infrastructure change on the business. Moreover, people-related information helps team members identify who will be affected by a change, enabling them to notify people in advance and keep them informed of change status.
- *Increased agility.* Insight into how business services and business processes map to the IT infrastructure enables the change management team to determine the effect of business changes on the infrastructure and, consequently, to readily adapt the infrastructure to changing business conditions.
- *Improved service delivery.* The CMDB provides a point of IT process integration across disciplines and domains, strengthening collaboration among IT groups and eliminating siloing. The result is improved service support and delivery and lower costs.

Relying on manual efforts to populate a CMDB and keep it up to date are impractical considering the complexity of the IT environment and the rapid rate of change that occurs in most organizations. Automated discovery tools are essential. These tools collect and format configuration and relationship information and record it in the CMDB. They also periodically scan the infrastructure for changes and record those changes in the CMDB to keep it current.

Conclusion

Standard industry frameworks play an important role in enabling you to evolve your IT processes to meet today's business requirements. To automate those processes, however, you'll need a management architecture that provides an accurate, all-encompassing view of your IT environment and a point of integration for the IT management applications and tools that are built on the architecture. A CMDB supported by automated discovery tools lets you build a unified architecture that increases operational efficiency and helps you achieve and demonstrate compliance with internal corporate policies and external government mandates. As a result, you'll dramatically enhance the business value that IT delivers to the enterprise.

For more information about a CMDB and discovery solutions, visit www.bmc.com/discovery.

About the Author

Kia Behnia *is responsible for leading the design of the BMC Business Service Management (BSM) architecture and the critical enabling BMC Atrium™ technologies. He was previously chief technology officer for the change and configuration products at BMC and chief technology officer for Marimba, Inc., which was acquired by BMC. Prior to joining Marimba, he served as a senior member of the technical team for Tivoli Systems, Inc.*

Set Your Sights on Continuous Compliance

By David Greene
Vice President, Solutions Marketing, BMC Software

For multinational enterprises, the regulatory maze is getting more complex by the day. Each geography has its own set of governmental mandates and industry best practices. The effort required to comply with any given legislative act can be astronomical.

But what if compliance was just a result of how you run IT? Savvy IT professionals are discovering that developing compliance projects around specific legislation or the many personal data privacy regulations worldwide is not a viable approach. Instead, they are building a *continuous compliance* capability that provides a sustainable way to address changing government regulations, industry best practices, and internal corporate policies as part of the day-to-day preparation.

This approach takes into account the fact that the need for compliance doesn't go away once you've passed an audit. It's a continuous effort. If your organization typically takes a project-

based approach to government mandates, some rethinking of current projects can help you make the transition to a continuous compliance philosophy.

Taking a New Perspective

If you've been operating in "project mode" to get through the next audit, it's time to change your perspective from "just complying with a mandate" to creating an enterprisewide program focusing on governance, risk, and compliance. So, if one of your highest-priority projects right now is preparing for a regulatory compliance audit, broaden your perspective. Clearly the project needs to focus on meeting the letter of the law. However, you should work toward reducing not only regulatory risk, but also operational risk. Moreover, your project should have a longer-term goal of reaching beyond compliance to improving your IT and operational processes and technology. That is, you should use compliance as a lever for business improvement.

For example, assume your company's key source of revenue comes from its online business. If your Web server goes down during manual maintenance tasks, your business can come to a screeching halt. To avoid this, consider establishing automated controls to manage changes to the servers that support online operations. Replacing tedious, manual controls with automated controls will more quickly satisfy auditors and can free up your staff to focus on innovative projects. It may also be the catalyst for reviewing your existing processes, such as those for change control, and determining how to streamline, simplify, and standardize them.

You should work toward reducing not only regulatory risk, but also operational risk. Moreover, your project should have a longer-term goal of reaching beyond compliance to improving your IT and operational processes and technology. That is, you should use compliance as a lever for business improvement.

You can also learn from past experience. Many organizations, for example, began their compliance initiatives by implementing more controls than they needed. The key is to try to reduce the number of controls. Just as an auditor's goal is to determine if a control set is sufficient, you should see where you can simplify and reduce your number of controls so you can manage them more effectively. By simplifying your approach, you can determine which controls do the job and which are excessive.

Avoiding Common Control Deficiencies

The most common IT control deficiencies are based on improper change controls. Issues related to system documentation, which can become material weaknesses, are a symptom of inadequate controls. When documentation does not match the control processes that are used for changes, you cannot ensure that changes have been correctly authorized, approved, and tested.

A proactive approach involves automating IT controls, continuously monitoring their effectiveness, simplifying verification through reporting and monitoring, and enforcing control policies. That doesn't mean you need to buy a lot of new software. It simply means that you need to use the software you have more effectively and, by integrating processes properly, simplify the number of controls you have in place.

Automation is vital because most control problems start when changes are made. All too often, IT teams that rely on manual processes must sort through thousands of changes (documented in spreadsheets) to determine if the changes apply to the compliance project and, if so, whether or not they were input correctly. By using automated controls and monitoring their effectiveness, the IT organization can work more efficiently and, at the same time, reduce costs.

A proactive approach involves automating IT controls, continuously monitoring their effectiveness, simplifying verification through reporting and monitoring, and enforcing control policies.

Another common control deficiency relates to inadequate identification and tracking of IT assets and data. This is one area where a configuration management database (CMDB) works well. The IT Infrastructure Library (ITIL®) recommends that organizations use a CMDB to maintain information that defines the relationships between components in the IT environment and the business processes they support. A CMDB maintains the relationships among technology assets, processes, and people as configuration items. The CMDB should be supported by technology that incorporates ITIL best practices. It then becomes the centerpiece for process integration, a powerful way to extend the coverage of automated controls. With a CMDB, there are fewer controls to document, verify, and test. As a result, a well-architected CMDB can reduce the cost for compliance and associated risks.

Inadequate identity and access control is another deficiency frequently found during audits. Proper control can help companies avoid many long hours with auditors and eliminate the need to explain why terminated employees or former contractors still have access to your systems. According to Control Objectives for Information and related Technology (COBIT), a best-practice framework for IT governance, you should have a formal process for granting and revoking access privileges to systems and data. It's also important to periodically review and confirm access rights. An automated solution should provide a workflow capability to formally define and enforce the process for handling requests and approvals. The solution should also enable IT to manage and track the inevitable isolated requests that come through the system.

It's also essential to address issues related to segregation of duties — another significant IT control deficiency. Financial institutions have historically used segregation of duties as a checks-and-balances security method. For example, a person in charge of negotiating purchases with vendors should not be involved in the payment authorizations. This methodology is now mandated at an IT level. Identity management solutions can address this problem by restricting access and ensuring a secure audit trail. The information can then be correlated to access privileges and categorized based on the level of privileges.

An important consideration related to segregation of duties is the practice of allowing development staff to run business transactions in the production environment so they can gather information required for problem resolution. This uncontrolled access can violate governmental mandates and jeopardize data integrity and availability. Automated solutions can give developers the capabilities they need to solve problems without giving them direct access to production systems. This enhances the integrity and security of data and processes.

For more information about BMC solutions for compliance, visit www.bmc.com/compliance.

Taking the Next Step

The key to moving toward continuous compliance is a change in mindset. The new mindset embraces compliance as a sustainable process. This approach enables you to support not only the objectives of a particular government mandate, but also helps you run your IT organization more efficiently and flexibly, further advancing your company's growth and profits. This strategy will become even more valuable in the future as IT's role in compliance efforts continues to increase. Make compliance a part of how you do business in IT, and you will spend less time with auditors and more time running a better IT organization.

About the Author

David Greene *has more than 20 years of experience in technology marketing, along with considerable expertise in IT controls and professional services. As vice president of Solutions Marketing for BMC, he oversees the definition, positioning, and promotion of the vast portfolio of customer-focused solutions delivered by the company. Prior to joining BMC, Greene was vice president of Marketing and Professional Services at Active Reasoning. Greene also held management positions in marketing and IT at Hewlett-Packard. He has degrees in architecture and computer science from the University of California, Berkeley.*

ITIL Plus CobiT:
Formula for Success in IT Governance

By Ken Turbitt
Global Best Practices Director, BMC Software

Peter Hill
Director, IT Governance Network

Do you know which approach will help you become more effective in meeting governance objectives by managing IT based on business priorities? Is it ITIL? CobiT? If you're wondering which one of these frameworks will be most effective at getting you to your end goal, the answer, most likely, is *both*. The IT Infrastructure Library (ITIL®) and Control Objectives for Information and related Technology (CobiT) are not alternate approaches, nor are they mutually exclusive. They are highly complementary methodologies that put you on a fast track to applying IT — not just to support business goals, but to drive them. Organizations that tap the power of both frameworks position themselves to:

> Establish proven best-practice IT service management processes to manage IT from a business perspective and achieve business goals, including compliance with internal policies and external demands

- Institute clear activity and process goals based on business goals, and provide a means of measuring progress against them
- Ensure effective IT governance and control at the process level, and enable IT to demonstrate that it meets or exceeds governmental requirements

Combined, ITIL and COBIT let you increase the quality of business services you deliver, while also lowering overall costs. ITIL addresses IT service management best practices, and COBIT addresses the establishment of business goals and the measurement of progress toward those goals. Following these frameworks will offer your organization the ability to provide fast, consistent, reliable technology services that increase revenue, reduce costs, and help you demonstrate compliance with the Sarbanes-Oxley Act (Sarbox), Basel II, and other regulatory requirements. They help you manage based on business priorities, also known as Business Service Management, or BSM.

ITIL and COBIT are not alternate approaches, nor are they mutually exclusive. They are highly complementary methodologies that put you on a fast track to applying IT — not just to support business goals, but to drive them.

What ITIL Brings to the Equation

ITIL has become a de facto standard for establishing IT service management processes. Although it covers multiple areas, its main focus is IT service management. ITIL provides a comprehensive, consistent, and coherent framework of best practices and related processes. Consequently, it promotes a quality approach for achieving business effectiveness and efficiency in the use of information systems. Because it helps you manage IT from a business perspective, it drives business goals, including those related to IT governance and regulatory compliance.

What COBIT Adds

COBIT is an IT-focused governance and control framework that many enterprises are adopting as the governance and control model for implementing and demonstrating effective IT governance across all areas of IT activity. COBIT is harmonized with established frameworks, such as the Software Engineering Institute's Capability Maturity Model, ISO 9000, ITIL, and ISO 17799 (standard security framework, now ISO 27001). It provides high-level, broad

coverage and focuses attention on what the business requires. A predefined sequence of generic and specific process goals guide the implementation and improvement of individual processes. Consequently, it can integrate disparate practices under a single framework and link those practices to strategic business objectives.

COBIT is intended to be used at the highest level of IT governance to achieve strategic objectives. It provides an overall governance framework based on a high-level process model of a generic nature that makes it applicable to most organizations. Processes and standards that cover specific areas in more detail, such as ITIL and ISO 27001, can be mapped to the COBIT framework to create a hierarchy of guidance materials. The key COBIT 4.0 domains include *plan and organize, acquire and implement, deliver and support,* and *monitor and evaluate*.

The Power of Two

ITIL helps you better align IT service delivery with the needs of your enterprise. To ensure that your ITIL implementation is successful, though, you need an effective IT governance and control framework. That's where COBIT comes in. Its broad-based governance framework offers guidelines to help you build capability and drive toward business requirements. COBIT focuses on the performance of key management practices and the monitoring of key performance indicators to ensure that the desired goals are achieved.

To ensure that your ITIL implementation is successful, you need an effective IT governance and control framework. That's where COBIT comes in.

Although COBIT is oriented toward IT processes, it addresses the organizational building blocks but not the process steps and tasks themselves. It focuses on what your enterprise needs to do, not how to do it. ITIL, on the other hand, focuses on methods and defines the processes, providing a generally accepted description of the service management processes. By leveraging both frameworks, you'll put yourself on a faster track to managing IT from a business perspective.

Getting Results

Implementing ITIL and COBIT is by no means trivial. To get optimum results, you'll need to address the high degree of complexity in your IT infrastructure, ITIL processes, and COBIT

control objectives. This complexity is due to the siloed approach IT organizations traditionally have taken to support specific business entities. The fact that IT environments are always in a state of flux adds to the complexity. In these environments, manual processes are not effective or efficient. They would depend on dedicated staff willing to maintain a reliable paper trail that can stand up to a rigorous compliance audit.

The only way to conquer this complexity is to deploy a systems-based IT service management solution. That solution should meet four key criteria. It should:

- Cover the full range of IT service management disciplines, and permit integration of processes across disciplines.
- Permit monitoring and management of the IT infrastructure from a business perspective. That means getting away from the traditional focus on individual servers, switches, and databases that enable online transactions, and instead looking at whether those transactions are occurring fast enough to meet the demands of the business.
- Have an underlying configuration management database that provides a single source of reference and control across IT disciplines to ensure that all processes are using consistent and accurate data.
- Provide out-of-the-box support for ITIL processes and COBIT control objectives to eliminate the need for time-consuming and costly customization of the software to support these frameworks.

As an IT professional, you face the challenging, but necessary, transition to IT management based on business priorities. ITIL promotes alignment between the services delivered and the needs of the business. COBIT provides the framework for goal setting and measurement. Together, ITIL and COBIT offer a powerful formula for helping IT meet business objectives and reap the resulting rewards, including the delivery of higher-quality business services at a lower cost.

For detailed information on ITIL, visit http://www.ogc.gov.uk/guidance_itil.asp.

For detailed information on COBIT, visit www.isaca.org.

For more information about BMC solutions for ITIL and COBIT, visit www.bmc.com/compliance.

About the Author

Ken Turbitt *is the global best practices director for BMC. He is focused on best practices for IT services, such as ITIL, COBIT, and eTom, among others, and presents this information to clients, partners, and analysts. Turbitt has held an ISEB ITIL Manager/Masters qualification for more than 12 years and has been a Gartner-qualified TCO consultant for more than 10 years.*

About the Author

Peter Hill *is a director of the IT Governance Network, a company specializing in IT governance consulting and training. Hill has extensive experience with COBIT, having used it as the umbrella model to implement IT governance, process improvement, compliance, and risk management activities for a number of clients. Hill has been at the forefront of information technology governance since the early 1990s and started working with COBIT in 1994.*

A Configuration Management Database: Your First Line of Defense in an IT Audit

By Cindy Sterling
Program Executive for Compliance, BMC Software

Many forces are converging to increase the burden and cost of doing business. IT organizations must deal with complex regulatory requirements, international standards, industry frameworks, and codes of good corporate practices. They also have to grapple with internal policies needed to manage business processes. IT must not only achieve compliance with the requirements set forth in these regulations, standards, and policies, but also be able to demonstrate compliance well after the activities have been completed.

Since most of today's business processes are supported by IT, much of the compliance burden falls on IT to achieve the level of compliance required in an effective, efficient, and sustainable manner. That's why effective controls need to be established and records retained for possible examination by regulators and auditors well into the future.

When auditors knock on company doors, they come not just to evaluate whether an overall business process meets regulatory requirements. They are also interested in determining the integrity of the configuration data of the individual IT processes that support business processes. What's more, they will want to know that the actual asset configurations continue to match the baselines on record.

As a result, IT must understand and be able to show the relationships of the components of the IT environment (people, processes, and technology) to the business processes they support. IT must also be able to produce records about the configuration of these assets. This presents IT with a challenge due to the continually changing nature of the environment. Consequently, the lack of integrity of configuration data can result in significant compliance issues for the organization. In addition, it can also mean that the IT infrastructure, resources, and capabilities are not being used in an optimal manner.

Who's Your Friend?

IT professionals are turning to a well-architected configuration management database (CMDB) as a repository for the information that is critical for reliable computer operations and that can make compliance processes easier to manage and track. Also growing in popularity are standardized industry frameworks that enable companies to achieve regulatory compliance and transition to a more business-oriented approach to IT management.

Since most of today's business processes are supported by IT, much of the compliance burden falls on IT to achieve the level of compliance required in an effective, efficient, and sustainable manner.

Two important standardized frameworks play key roles. The IT Infrastructure Library (ITIL®) offers best practices in service management, while Control Objectives for Information and related Technology (COBIT) provides controls for compliance. A CMDB, in turn, provides the foundation for implementing both the ITIL and COBIT frameworks.

The CMDB offers immediate access to information about the configuration of the IT environment and changes that have been made. It is a source of reliable, detailed, current, and historic data about your business. If properly federated, a CMDB can accurately substantiate your business practices against regulatory controls, so you can breathe easy during audit times. A federated CMDB is an approach that features a centralized database linked to other

data stores with a common data model that carries information from one point to another, without the need to rewrite code.

CMDB as Facilitator

To meet regulatory compliance for auditing, IT needs to manage and track the technology, people, and processes in the IT environment from a business process perspective. A CMDB ideally facilitates this activity.

Think of a CMDB as the central repository through which IT management processes in your IT infrastructure can exchange information. The CMDB is a place where disparate sources provide information about changes, releases, configuration, assets, incidents, and so on. A CMDB should hold important information that helps IT understand the relationships of the components in the IT environment to the business processes they support. It should identify a set of configuration items and maintain all IT resources — technology assets, processes, and people — as configuration items. The CMDB should also maintain important details about those items and their relationships and facilitate two major compliance requirements:

> Tracking and reporting

> Configuration control and verification

To meet regulatory compliance for auditing, IT needs to manage and track the technology, people, and processes in the IT environment from a business process perspective. A CMDB ideally facilitates this activity.

Tracking and Reporting

A major compliance requirement is that all activity in the IT environment that affects business processes must be tracked and reported, creating an audit trail of activity. Tracking and reporting must be done from the perspective of the business process, and in a holistic fashion that ties together all the IT processes that support the business processes.

Many organizations create compliance reports using processes laden with manual procedures. The IT staff gathers data manually from a number of sources scattered across the enterprise, manually consolidates the data, and then manually correlates the data to business processes. This approach is time-consuming, labor-intensive, error-prone, and expensive.

The CMDB, in contrast, provides a single, comprehensive, and easily accessible source of tracking information for reporting purposes, eliminating the need for manual data gathering and consolidation. By providing automatic tracking of pertinent IT processes, and by mapping the IT processes to business processes, the CMDB ensures data integrity and facilitates significant cost reductions in compliance reporting.

CMDB — Your Single Source of Truth

Through the information maintained in the CMDB, IT can understand the impact of IT processes on business processes with respect to compliance. For example, it can facilitate answering the following questions:

- Was compliance impacted when data used by a specific business process was migrated to another data storage device?
- Has compliance of a specific business process been impacted by incidents and problems that have occurred? If so, what was the outcome?
- Has compliance of a specific business process been affected by changes made to the IT infrastructure?
- Does a specific business process meet compliance with respect to data backup procedures?

Configuration Control and Verification

Unauthorized changes expose the organization to noncompliance. For example, the deployment of an untested patch to a server operating system opens up a security hole in a financial reporting application, which results in a noncompliance status. That's why it's critical to ensure that all changes are carefully controlled through best-practice change management processes.

Here's how the CMDB can help. The CMDB can be configured to maintain:

- A list of authorized configurations for all IT technology assets
- A list of all people authorized to approve changes and what types of changes each person is authorized to approve
- A list of all people authorized to implement changes and what types of changes each person is authorized to implement

Your change management application can use this data to ensure that only authorized people are approving and making changes, and that they are implementing only those changes they are authorized to implement. Autodiscovery capabilities can be added to the environment and used to continuously monitor the IT infrastructure, updating the configuration information maintained in the CMDB and automatically recording all changes, both planned and unplanned.

The CMDB maintains a mapping of IT resources to business processes. This mapping information can be used by compliance analysis and reporting mechanisms to automatically correlate events to business processes.

The configuration management application can be used to monitor the data in the CMDB to detect any changes, therefore helping to identify whether a change has resulted in an unauthorized configuration, and if so, what business processes are affected by the changes. This continual update of the CMDB provides two important functions for compliance:

> An early warning of unauthorized change

> An audit trail of all changes, both planned and unplanned

If it detects an unauthorized configuration that results from a change, the configuration management application can restore the offending resource to an authorized configuration and record an audit trail of this restoration in the CMDB.

Finally, and perhaps most importantly, the CMDB maintains a mapping of IT resources to business processes. This mapping information can be used by compliance analysis and reporting mechanisms to automatically correlate events to business processes. It permits tracking and reporting of the overall business process, automatically tying together the multiple IT processes involved in the overall business process.

By putting in place a CMDB and leveraging that foundation with IT service management applications that support ITIL best practices and CobiT controls, organizations can reduce the cost and effort of achieving and demonstrating compliance with government regulations, industry standards, and internal policies. What's more, compliance efforts can act as a catalyst and provide a foundation for the initiatives that align IT even more closely with the business.

For more information, visit www.bmc.com/cmdb.

About the Author

Cindy Sterling *joined BMC in 1993 and has been responsible for the execution of compliance initiatives. She has held technical and management positions at BMC, supporting various product lines that include job scheduling, output management, storage, application management, and identity management.*

Mainframe Management:
The Need for a Holistic, Unified Approach — Where ITIL Fits In

By Ralph Crosby
Chief Technology Officer, Mainframe Business Unit, BMC Software

Carl Greiner
Senior Vice President of Infrastructure, Software, and IT Services at Ovum

Mainframe architecture has evolved from a centralized system running a single operating environment, to a distributed resource that hosts multiple operating environments and runs applications and workloads that are distributed across multiple mainframes. Many mainframe management practices, however, have not kept pace with the mainframe's advance into the distributed world. As a result, mainframe operations people are struggling to manage their systems effectively. In particular, they are hampered by a lack of efficient processes for application, change, release, configuration, incident, and problem management.

Moreover, mainframe management practices in general are isolated from those used for distributed systems. IT organizations need to take a holistic approach to IT infrastructure management. To become a trusted business partner within the enterprise, IT must unify the management of complex, distributed processing environments that encompass all platforms. That's the only way to ensure that complete business processes, dependencies, costs, and service levels are accurately reflected. Fortunately, lessons learned in the distributed environment can provide insight into how you can bring your mainframes into a comprehensive IT management environment.

Lessons from the Distributed Experience

Technology advances — such as logical partitioning, parallel sysplex, and geographically dispersed parallel sysplex (GDPS) — have enhanced the inherently robust nature of mainframe hardware, enabling it to maintain its tough resilience and high performance as it plays an increasingly important role in the distributed world. Traditional management practices related to this resilience and performance are keeping pace with the rapidly changing landscape of the IT environment. For areas where traditional practices are falling short, however, you can draw on the experiences of people who manage distributed systems, leveraging the proven processes they have developed for multiplatform environments that are often geographically dispersed.

Mainframe management practices in general are isolated from those used for distributed systems. IT organizations need to take a holistic approach to IT infrastructure management.

Distributed management processes encompass many IT disciplines: asset management, application management, change and release management, service level management, configuration management, and incident and problem management. These processes have evolved to emphasize management of the distributed IT infrastructure from a business perspective. Interestingly, they have their origins in mainframe practices. In the early 1980s, the original systems management concepts were documented in a four-volume series called *A Management System for Information Systems*. These *yellow books*, as they are called, define and describe a generic model of 42 processes called the Information Systems Management Architecture. The yellow books provided key inputs into the original set of IT Infrastructure Library (ITIL®) books.

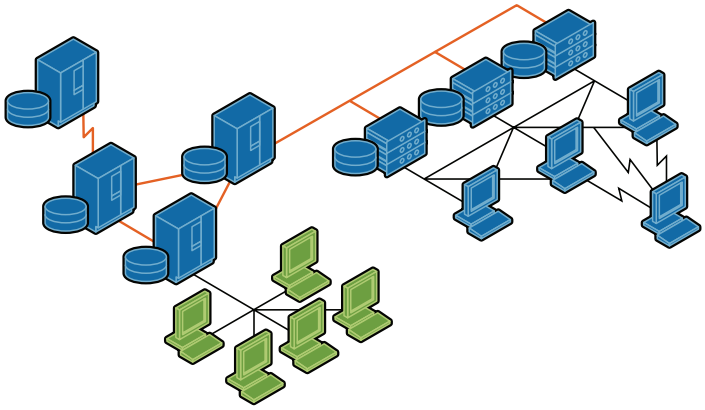
Developed for mainframes, the original yellow book processes have been adapted and enhanced in ITIL to address distributed needs. For example, the yellow book concept of Change Control (as a subset of Resource Control) addressed only the transfer of deliverables from projects into production. ITIL expands that definition, stating that "The goal of the Change Management process is to ensure that standardized methods and procedures are used for efficient and prompt handling of all changes, in order to minimize the impact of change-related incidents upon service quality, and consequently improve the day-to-day operations of the organization."

Insights Based on ITIL Best Practices

Distributed IT management processes are supported by a variety of applications, tools, and technologies. Many of today's IT service management solutions integrate these applications, tools, and technologies to create seamless IT management infrastructures. Some of these solutions enable management of the IT environment from a business perspective based on ITIL best practices. And some incorporate mainframes. For example, solutions are capable of exposing the mainframe to the configuration management database (CMDB), a key component of the ITIL-defined management infrastructure. The CMDB provides a single source of accurate information about the IT environment that includes the people, processes, and technology in the environment. A well-architected CMDB also maintains information about the physical and logical dependencies of the components, and the relationships of the components to the business services they support.

By adopting distributed processes for mainframe management, IT professionals can manage the entire IT infrastructure using a single, integrated management infrastructure — one that permits management based on business impact and on the relationship of the mainframe to the other components of the IT infrastructure.

As the IT management solutions developed for the distributed environment evolve to include the mainframe, the operations staff can adopt those solutions — and the management processes they support — to address the challenge of mainframe management in an all-inclusive environment. Adoption of the distributed IT management processes by the mainframe support staff brings the processes full circle — from their original role in the mainframe environment to their expansion and enhancement to support distributed systems and finally to comprehensive and unified management of the total IT environment.



The evolution of the mainframe environment

By adopting distributed processes for mainframe management, IT professionals can manage the entire IT infrastructure using a single, integrated management infrastructure — one that permits management based on business impact and on the relationship of the mainframe to the other components of the IT infrastructure, recognizing the importance of the mainframe within IT infrastructure management.

Business Benefits

A number of enterprises are aggressively pursuing a unified management approach that brings the mainframe into the mainstream of IT management. The business benefits they report are compelling. First of all, an integrated approach to managing the environment gives IT greater insight into the impact of IT on the business and, conversely, the impact of the business on IT. Consequently, IT can focus on the activities that are most important to the business. In addition, mainframe specialists can apply change and release management technologies developed for distributed systems to their mainframe systems. As a result, they can automatically distribute software from a central distribution server to all appropriate machines and verify successful installation of software, saving months of time in deploying new mainframe applications.

In addition, incorporating the mainframe into the mainstream of IT management increases the role and visibility of the mainframe staff within the organization. Staff members become more business oriented and, as a result, can more effectively demonstrate to senior management the contribution of IT to the business.

Furthermore, by integrating mainframe management into the organization's overall IT management infrastructure, the mainframe operations staff can include the mainframe in the CMDB, thereby gaining a holistic view of the infrastructure. This consolidated view speeds incident and problem resolution and enables the staff to prioritize their efforts based on overall business impact. A consolidated view also helps reduce business service disruptions due to failed change implementations because the staff can better assess the impact of planned mainframe changes on other infrastructure components and on business services. Moreover, staff members can plan changes based on business implications, scheduling changes around business factors, such as end-of-month and seasonal peak workload periods.

By integrating mainframe management into the organization's overall IT management infrastructure, the mainframe operations staff can include the mainframe in the CMDB, thereby gaining a holistic view of the infrastructure.

The mainframe's advance into the distributed world has created challenges, not only for the mainframe support staff, but also for the IT organization as a whole. IT management processes that have been developed for the distributed environment, such as ITIL, and the system-based solutions that support them are being extended to the mainframe. This unification of IT infrastructure management across all domains will allow you to leverage mainframe processing, virtualization, and staff skills where appropriate, and provide a consistent and repeatable process management capability to your enterprise.

For information about BMC solutions for the mainframe, visit www.bmc.com/mainview.

About the Author

Ralph Crosby *is chief technology officer of the BMC Mainframe Business Unit, where he is responsible for setting the strategic technology direction for the entire portfolio of IBM mainframe products. He has authored several products in the DB2 product line and has worked as an architect in storage management.*

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Carl Greiner *is senior vice president of Infrastructure, Software, and IT Services at Ovum (www.ovum.com). He joined Ovum after 12 years at META Group, where he was senior vice president, directing data center (infrastructure) coverage. Prior to that, he was a senior vice president for Gartner, focusing on data centers and storage in the software cluster.*

Hybrid Monitoring Delivers Greater Flexibility and Affordability

By Israel Gat
Vice President, Infrastructure Management, BMC Software

Most of the time, having a choice is a good thing. But in the case of system monitoring solutions, your choices — *agent-based* versus *agentless* technologies — aren't easy. Both have advantages, but also have major downsides. If you choose an agent-based solution, you can collect in-depth information about infrastructure components. These solutions, however, are costly to implement, so you can't afford to instrument your entire infrastructure. And, because you can't detect problems in components that are not instrumented, you're often forced to operate in reactive mode, remaining unaware that problems are occurring until users report slow performance or service disruptions.

Agentless solutions are more economical and allow you to instrument more of the environment. However, they don't provide the level of detail you need for optimal system management. The lack of detail slows down analysis and resolution, and causes you to lose valuable time as you scramble to gather the additional information you need to get services back online.

Fortunately, you're no longer locked into a choice. Innovative hybrid solutions are bringing agent-based and agentless monitoring technologies together in a single, integrated infrastructure that simplifies IT management while improving business services availability and reducing IT costs.

Full and Flexible Instrumentation

Just as hybrid automobiles offer both the power of the gasoline engine, when needed, and the lower cost of operating an electric motor the rest of the time, hybrid monitoring solutions combine the best of agent-based and agentless technologies. Hybrids offer the broad and highly granular monitoring, management, and control of agent-based technology where you need it, while also delivering the cost-effectiveness of agentless technology for infrastructure components that don't require in-depth monitoring and control.

Innovative hybrid solutions are bringing agent-based and agentless monitoring technologies together in a single, integrated infrastructure that simplifies IT management while improving business services availability and reducing IT costs.

The hybrid approach offers another advantage as well. It provides a middle ground between the in-depth information collected by agents and the less-detailed information that is collected by agentless solutions. You can deploy and integrate both agent-based and agentless solutions to achieve greater flexibility in the level of monitoring. Because you can deploy and maintain them automatically, administration costs are low.

With the new hybrid approach, you can fully and cost-effectively instrument your entire IT infrastructure, applying exactly the right level of monitoring for each component. You can deploy agents to manage business-critical infrastructure components — for example, on servers running your e-commerce Web site — while using agentless monitoring for components that are less critical — such as departmental printers.

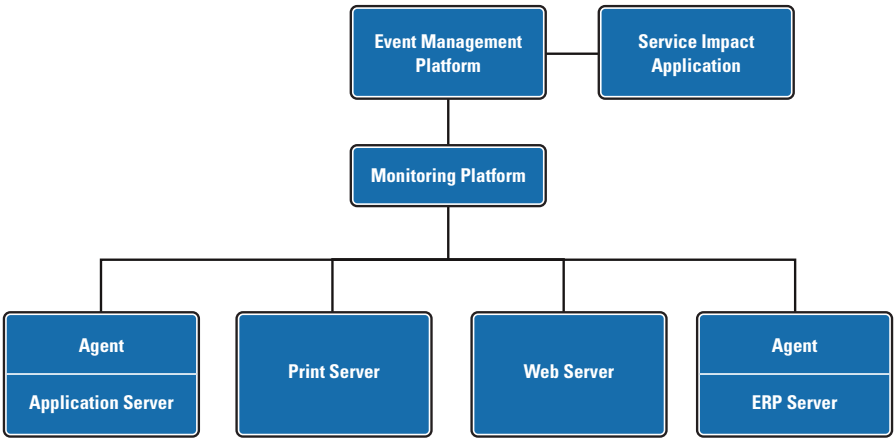
Comprehensive Management

The economy and flexibility of hybrid monitoring means you can reach more components than before. As a result, you can create a comprehensive early-warning system that helps you head off problems before they result in outages. Proliferation of management to all IT components increases IT efficiency. Greater breadth and depth of monitoring on critical system components translates into better insight into issues. You can also ratchet up the level of automation, and you can resolve incidents on critical system components faster. Across-the-board monitoring also accumulates valuable historical information to support trending analysis.

Proliferation of management to all IT components increases IT efficiency. Greater breadth and depth of monitoring on critical system components translates into better insight into issues.

The information and alerts provided by hybrid solutions can enhance other service management applications. The monitoring platform, for example, can forward events to an event management platform that filters, categorizes, and correlates the events based on contextual information that the monitors provide. The result: event handling is more efficient. The event management platform can automate responses to certain events, ensuring faster action and eliminating the need for human intervention. It can also pass events to a service impact management application for assessment of the business impact along with detailed information that helps you prioritize your actions — so you work first on the problems that would have the biggest effect on the business. Enhanced information improves the effectiveness of other applications as well. For example:

- The event management platform can automatically generate incident tickets based on events it receives from the monitors, and then forward the tickets to the incident and problem management application, attaching rich contextual information from the monitors to facilitate incident resolution and problem diagnosis.
- The service level management application can use the performance and availability information provided by the monitors to detect when an IT business service is in danger of exceeding allowable thresholds. The application can generate a heads-up alert that prompts the service level management team to take immediate action.



Integrating agent-based and agentless technologies with the hybrid approach

- The capacity management application can use monitor-collected information to ensure that adequate processing and storage capacity is available and, when a threshold is reached, prompt the operations staff to take action. If capacity on-demand is in place, the system can switch in additional processing or storage capacity in response to the alert.
- The capacity management team can use historical information gathered by the monitors to uncover trends, and then employ predictive analysis to ensure sufficient capacity for future requirements.

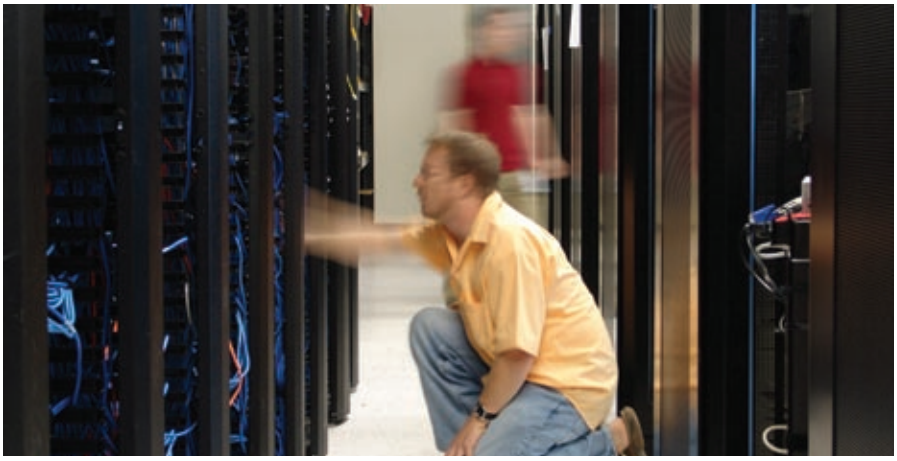
Conclusions

The emergence of the hybrid approach is exciting because it means that IT organizations are no longer locked into an approach that limits flexibility and drives up costs. Hybrid solutions are also beneficial because they provide a path to the future. By offering three types of monitoring and control technologies, hybrids give you the flexibility to move to this new world at your own pace. As embedded management agents grow in capability, you can adjust the technology mix, continually tuning it and optimizing its value.

For more information on BMC solutions that address these issues, visit www.bmc.com/performancemanager.

About the Author

Israel Gat, *vice president of Infrastructure Management at BMC, is responsible for the BMC® Performance Management and BMC® Recovery Management solution families, and has been an executive for some of the world's top technology companies, including Microsoft, IBM, Digital, and EMC.*



Slash Data Center Costs with Just-in-Time Provisioning

By Fred Johannessen

Vice President and Program Executive for Capacity Management and Provisioning, BMC Software

Dedicated servers and redundant backup servers for each business-critical application. Enough capacity to support the largest possible workload for these applications, even if the peak occurs only once a quarter or once a year. Plus all the extra devices and components needed to support these servers and applications, not to mention the staff to deploy, maintain, and upgrade them. Many organizations today deploy all these resources to ensure that the IT systems supporting critical business services are always available when needed and performing at a level that's acceptable to business users.

The problem with deploying all these resources is that you end up with far more server capacity than you need — capacity that sits idle most of the time. It's called overprovisioning. And it can more than double your acquisition, deployment, and management costs for resources that support business-critical services. Moreover, it affects virtually every data center cost — from power, cooling, and floor space to administration and software license fees.

Fortunately, a new computing model for managing IT resources is putting an end to overprovisioning: utility computing. Utility computing enables real-time capacity management that delivers just-in-time capacity. It can increase average IT resource usage rates to optimum levels while maintaining high availability and performance. In the past few years, the term *utility computing* may have been over-hyped; it seems to be used less frequently today probably because of over-hyping. The interminable evolution toward utility computing as a model, however, is occurring nonetheless, and IT professionals are making real progress toward IT as a utility — that is, adopting the same model as utility power providers.

Utility computing enables real-time capacity management that delivers just-in-time capacity. It can increase average IT resource usage rates to optimum levels while maintaining high availability and performance.

What Is Utility Computing?

Utility computing is a model in which each IT resource is treated as a unit of capacity that is delivered when and where it is needed. Resources are shared across applications. Servers and their associated resources are aggregated into pools and allocated to applications as needed. When an application needs more resources — perhaps because of a component failure or a spike in demand — allocation occurs immediately. When demand subsides, resources are returned to the shared pools.

What Technologies Do You Need?

Server virtualization and systems-based automation are two key technologies for enabling utility computing. Server virtualization is the running of multiple server images — called virtual servers (or machines) — on a single physical host server. To the environment, virtual servers look just like separate physical servers. Physical servers can run different operating systems and applications concurrently in isolated virtual machines and can host virtualized high-speed network connections between virtual servers. This technology reduces the

number of physical servers and associated hardware components you need because virtual servers share network and storage devices.

Modeling eliminates the guesswork associated with physical server sizing and helps you achieve maximum resource utilization.

Systems-based automation solutions help you plan, build, operate, and manage your utility computing infrastructure. They simplify management, increase efficiency, and reduce costs by providing:

> Automatic discovery

> Modeling of the IT infrastructure

> Availability and performance monitoring and management

> Real-time capacity management

> Automatic provisioning of resources

> A single source of resource reference across all IT disciplines

What Steps Should You Take?

Implementing a utility computing environment involves four steps:

1) Discover (verify)

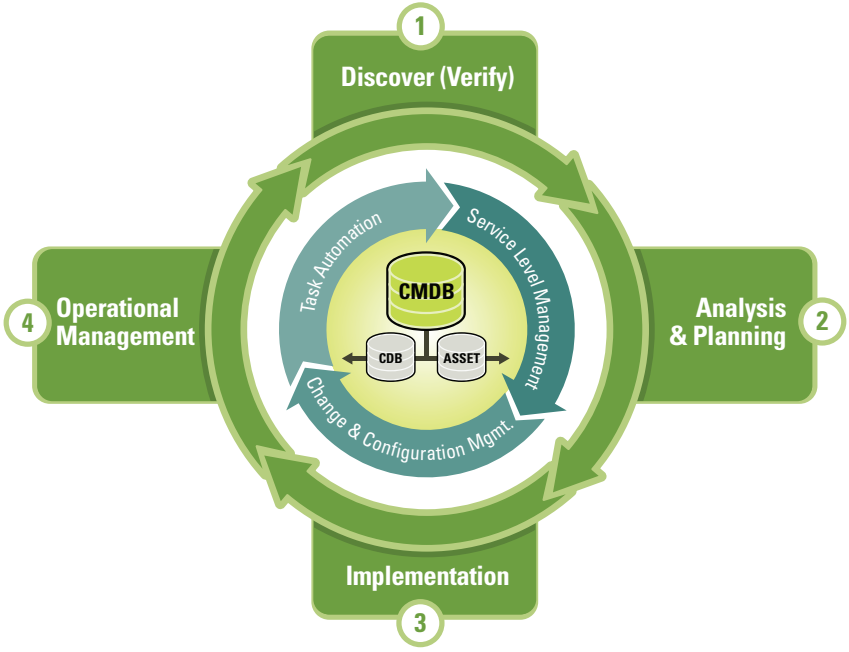
2) Analysis and planning (modeling)

3) Implementation

4) Optimization (operational management)

Step 1 — Discover (Verify)

The starting point for utility computing is to discover all assets in the IT infrastructure and populate a configuration management database (CMDB) with information about those assets, their configurations, and their users. With this information, you can determine the relationships among the resources and the services they support. Systems-based solutions come into play here by discovering assets automatically, populating the CMDB, and updating it to reflect changes in the infrastructure. Because the infrastructure changes constantly as you add, update, and replace components, automated discovery must run on a regular basis to keep the CMDB up to date.



Four steps to implementing a utility computing environment

Step 2 — Analysis and Planning (Modeling)

Step 2 involves modeling the target environment to create a workload or application perspective of resource utilization. Modeling eliminates the guesswork associated with physical server sizing and helps you achieve maximum resource utilization. You interact with the model and vary parameters until you know:

- How many physical systems you can move onto a single physical host server as virtual machines
- How big the physical host server must be
- What the right mix of virtual machines on each physical host server is
- How future growth will affect capacity requirements
- What the current resource demand cycles are relative to the business services

The result of this step is a comprehensive hardware resource plan — knowledge of the specific hardware configurations needed to sustain the virtual environment.

Step 3 — Implementation

Step 3 involves moving physical server workloads to virtual servers, which means you'll be making potentially complex changes to the overall IT environment. To minimize risk, you need to encapsulate all changes within a broader change and configuration management process that ensures that only planned changes are authorized, only authorized changes are made, and that changes are implemented as planned and authorized. It's best to take an incremental approach that starts with workloads that have the greatest potential for improvement. It's also wise to work in a test environment first.

To minimize risk, you need to encapsulate all changes within a broader change and configuration management process that ensures that only planned changes are authorized, only authorized changes are made, and that changes are implemented as planned and authorized.

Automation during this phase helps bring accuracy, repeatability, and scalability to the entire project. To ensure accuracy and compliance of the resulting total configuration, you need to build a Definitive Software Library (DSL) that defines specific software configurations, such as versions and patch levels required for all the hardware configurations specified in the resource plan.

Step 4 — Optimization (Operational Management)

In Step 4, you implement the utility computing environment, which involves automating the sharing and provisioning of physical and virtual resources and applications. This orchestration is based on resource allocation policies that you have established. To ensure service levels, it's important to provide sufficient time to act when implementing real-time resource allocation. Traditional change management relies on manual steps and change approval boards, so it is critical to establish the automation policies and subject them to comprehensive, closed-loop change and configuration management processes prior to implementing real-time resource allocation strategies. This approach ensures that only planned and authorized allocation decisions are made in real time.

Putting It All Together

Overprovisioning is a costly approach to ensuring availability and performance. Fortunately, it is no longer the only approach. Utility computing — and the virtualization and systems-based automation technologies that make utility computing a reality — helps you transition to a just-in-time approach. This makes resources and capacity available precisely when they are needed. Moreover, they position you to meet the demands of business users for a continual stream of new and more advanced business services. As a result, you can adapt to changing business requirements while continuing to deliver high-quality business services at the lowest possible cost. BMC offers solutions that can proactively and effectively manage virtual server environments while minimizing the risks in deploying virtual servers.

For more information, visit www.bmc.com/provisioning.

About the Author

Fred Johannessen, *vice president and program executive for capacity management and provisioning at BMC, has managed the execution of capacity management and provisioning across the value chain, including research and development, marketing, and sales.*

Get More Value from Your Service Desk with Service Request Management

By Doug Mueller
Chief Technology Officer, BMC Software

How much does it cost your enterprise when an employee calls to request a new computer, a telephone, an Internet connection, or access to an application? One service desk team estimated that it receives 1,800 calls a week from people submitting or checking on the status of these requests. The cost was about $325,000 a year. And that's just for one-off requests. What does it also cost when a new employee comes on board, and dozens of requests have to be submitted for office space, furniture, equipment, supplies, training, ID badges, and access to IT services? What about when an employee transfers, gets promoted, or leaves the company? All these requests are in addition to the traditional calls for assistance with hardware or software issues, password resets, and additional hardware or software.

IT organizations waste time and money related to performing manual interactions, obtaining approvals, coordinating tasks across various groups, shuffling paperwork, and dealing with process inconsistencies among the different types of requests. Throwing people at the problem doesn't help; it only drives costs up further and adds the potential for miscommunication and errors.

Fortunately, there is a solution to this problem. It lies in streamlining and standardizing work request processes and implementing service request management (SRM) software that automates those processes and lets end users submit and check on requests without calling the service desk. This article examines important considerations to ensure a successful SRM implementation.

Provide One-stop Shopping

One of the biggest obstacles to effective service-request handling is the siloed approach found in many enterprises. Different groups using different tools make it difficult for IT to coordinate efforts and for users to figure out the right person to contact for assistance. An effective SRM implementation creates a single place where people can go to find and request the services they need, regardless of what the service is or which department provides it. This one-stop-shopping approach works well only if the online interface is easy to use, helping the requester quickly determine the services available and what those services will cost. Requesting services and tracking the status of requests should be simple and straightforward. Moreover, it should be simple and straightforward for departments to advertise their services to increase awareness in the user community.

An effective SRM implementation creates a single place where people can go to find and request the services they need, regardless of what the service is or which department provides it.

Integrate with Existing Systems

Most likely, you have processes and systems in place to handle many different types of requests. There's no point in implementing SRM software that duplicates the capabilities of these back-end systems. The most effective approach is to integrate with existing systems, leveraging their capabilities to drive the processes they support. If you have IT service management applications to address change, release, configuration, incident, problem, and asset management, then an SRM solution can act as a front end. It would pass requests

to the appropriate application and associated workflows through multiple applications. For example, if a user requests an update for a desktop computer, the SRM solution should pass the request to the change management application and monitor the progress through the change process, as well as through the process of updating asset information wherever it resides.

If you have a configuration management database (CMDB), then integrate your SRM solution with it to leverage CMDB data. You should also integrate your SRM software with service level agreement (SLA) applications as well, to ensure that service fulfillment occurs within agreed-upon time frames. The ability to roll up information pertaining to service fulfillments and integrate this capability into costing systems enables you to calculate total service fulfillment costs and determine if the price charged for a service covers the actual cost.

Because your SRM environment is likely to expand in many ways — as the enterprise grows and as additional departments see the value in funneling their requests through the service desk — pay attention to scalability.

In addition to these benefits, integration with existing systems and processes also increases your return on investment, assuming you are using best-practice processes such as those defined by IT Infrastructure Library (ITIL®).

Consolidate the Online Service Catalog

A key part of any effective SRM project is providing a comprehensive online service catalog that lists services and prices. Easy catalog navigation is a must, and services need to be presented in everyday business terms, not technical descriptions. A business-oriented interface ensures that business managers can add services to the catalog without IT staff intervention, enhancing satisfaction among business users and reducing the burden on the IT staff.

Populating online request forms with known information saves time for users and increases accuracy. For example, if a user requests an update to an application on his or her desktop computer, the solution can look up which desktop computer is already assigned to that user and fill in the appropriate fields on the request form with hardware and software configuration data.

Using SRM to Bring a New Employee on Board

Adding a new employee to your company involves completing dozens of requests that range from office space and furniture to computer hardware and software, orientation and training, and even supplies. With a strategic request process and SRM software, bringing a new employee on board can become effortless and error-free. Here's how it works:

- Before the new employee starts work, the hiring manager accesses the company's online service request catalog, which lists all company services available to that manager
- The manager selects the *on-board new employee* service
- The SRM system triggers all the requests required to ensure the new employee has the tools and services to start work immediately, such as:
  - Creation of the employee record in the HR system
  - Addition of the employee to the payroll system
  - Assignment of office space and telephone equipment
  - Provisioning of IT services, including configuration of desktop and/or laptop computers with appropriate software and granting of access to appropriate enterprise applications
  - Creation of ID badge
  - Enrollment in new employee orientation class
  - Delivery of office supplies
- The system processes and monitors all requests, performing tasks, such as:
  - Obtaining required approvals
  - Initiating the next step in the process once approvals are received
  - Tracking all requests through to successful completion, notifying the appropriate people if intervention is required
- The hiring manager can check on the request status throughout the automated process

Enable Easy Expansion and Scalability

Many IT organizations launch service desk initiatives with the idea of handling requests for IT services only. When facilities, HR, training, and other departments see what a good job IT is doing, they want the service desk to broaden its scope to handle all employee requests. So, when you architect your SRM solution, make sure it can expand

to include more than just IT services. Moreover, it should be able to handle services that are not supported by back-end systems. To do this, your SRM software must provide a workflow engine that permits the department providing the service to define workflow. The software can then generate a task list to fulfill the service requests and forward the list to the appropriate fulfillment groups for task execution.

Because your SRM environment is likely to expand in many ways — as the enterprise grows and as additional departments see the value in funneling their requests through the service desk — pay attention to scalability. Look for robust software with the ability to handle a high volume of requests and a large number of requesters and services.

The Rewards

The volume of service requests that your service desk must manage is certain to grow. Even if your service desk handles only requests for IT services, your enterprise will continue to demand an ever-increasing array of services for an expanding user base. Most likely the service desk will expand its coverage to other types of requests, including those traditionally handled by facilities, HR, and training. It makes good business sense to consolidate requests because of the increased efficiency that comes from applying standard practices and the ease of use for employees who can go to a single source for all requests. Enterprises that have gone through this consolidation effort are reaping substantial rewards, including higher employee productivity, reduced workload on the IT staff, faster fulfillment of requests, and lower business costs.

For more information, visit www.bmc.com/srm.

About the Author

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The Service Desk of the Future: Why You Need One Desk for Internal and External Customers

By Doug Mueller
Chief Technology Officer, BMC Software

Look around any Fortune 1000 organization and you'll find a variety of service desks and/or help desks for both employees and external customers. Perhaps you'll see more than one IT help desk — one for logging routine HR matters, one for logging manufacturing defects, and another for customers to call with product-related problems or repair calls. Despite their different functions, locations, and personnel, all of these service desks have one thing in common — they provide a vehicle for handling the organization's problems, with specific groups of employees taking and following up on telephone calls or e-mail messages.

On the other hand, if you've got multiple service desks, this involves having multiple products maintained by a disparate group of people. It requires multiple storage mechanisms and

flows, different processes, data stores, techniques, and interfaces. All of these requirements put an unnecessary financial burden on IT, and on the entire business. In addition, employees and external customers might feel the effects of this service desk redundancy because they might not be sure of where to go for help.

As a result, it's easy to understand the cost and efficiency benefits of consolidating the service desk solutions into one platform. Enlightened software vendors are addressing this need. After all, regardless of the functional area of business, the consolidated service desk provides employees or external customers with one central place to go to enter problems, receive confirmation that the work will get done, and monitor the status of the work. In fact, three years from now, there will not be separate help desk and customer support solutions. There will be a consolidated service desk solution. This may even happen sooner than you think.

How to Begin the Consolidation Process

Organizations can lay the foundation for their consolidated service desk by first examining whether their different groups — internal and external — actually need different functions. Do they really need different processes, or can they leverage the same ones? Where's the commonality across the environments?

Regardless of the functional area of business, the consolidated service desk provides employees or external customers with one central place to go to enter problems, receive confirmation that the work will get done, and monitor the status of the work.

Armed with this knowledge, IT organizations can plan to eliminate duplicate tools and flows, and make an investment to have a consolidated solution for the environment. However, they might want to start small by leveraging some common elements across different environments. The first task might include combining two service desks with a standard set of processes, a common set of interfaces, and a common flow. For example, some of our customers for many years have used some type of a single consolidated service desk across their internal environment. They've achieved this functionality by putting all of the internal help desk systems together and parceling out the work according to which group needed to respond to a particular problem.

There are no real standard best practices for running a consolidated service desk across multiple disciplines, both internally and externally. However, the IT Infrastructure Library (ITIL®) provides some good best practices to help guide you in this consolidation, such as the recommendations for incident management and change management.

The consolidated service desk uses a common technology, a common set of processes, and a core set of interfaces and interactions. For example, a Web front end provides a common access method for both employees and external customers to submit problems or review them. You don't want to deploy a client on every desktop, especially for external customers. You also need a self-help capability, such as a knowledge-based system, which enables people to look up information and solve their problems on their own.

How the Two Service Environments Are Merging

Some of our customers have already started to consolidate their internal help desks. This consolidated desk often contains details about service agreements and entitlement, and often provides self-help — all of which are functions that previously tended to fall into the external customer support realm. In this merged environment, organizations are starting to gather data related to both desks, such as configuration management, which is also critical to external customer support environments. To this end, external and internal services areas, which tend to have little interaction with each other, are inheriting more and more of each other's functionality.

What's the Payback?

Help desk and customer support applications should have many capabilities in common. More recently, some of our customers, for example, started using our customer support system for internal support. That motivated us to look at taking key functionality from each desk and see how it could be consolidated it into one solution. Our vision is for the two solutions to come together to form a single technology base with all the features needed for external customer support, and all of the features for an internal help desk. To this end, you can leverage all the available features in the solution to provide a richer result to combined customers in both environments. This means that you'll have additional features more specialized for one environment than the other. It also enables you to get entitlement support so you can actually start offering different levels of service to internal people as appropriate

to your environment. And for external customer support, this includes incorporating ITIL best-practice guidelines previously unavailable.

The consolidated service desk uses a common technology, a common set of processes, and a core set of interfaces and interactions.

The big gains of this approach come from having a single technology that provides your staff with a single set of things to learn for managing all of these environments. By eliminating the need to run different processes, you can use common mechanisms to run multiple business processes, or multiple aspects of your business. As a result, you can run your business more efficiently, while saving on maintenance and management. So, get ready and start planning how to leverage these capabilities, because a consolidated service desk will be here sooner than you think.

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Strategies for Effective Application Problem Management

By Herb VanHook
Vice President, Corporate Strategy, BMC Software

Outdated, manual approaches to problem management — for example, "eyeballing" logs and spreadsheets or running internally written scripts — are costing businesses like yours a lot of money. According to one industry study, software defects cost the U.S. economy about $60 billion annually, primarily because of the impact on business availability and performance. The $60 billion includes the labor cost to find and fix these problems. The study also reports that 80 percent of the time spent in managing an application lifecycle is spent fixing defects.

To reduce these costs, you need proactive and timely problem detection coupled with automated problem isolation. That calls for the right combination of software and processes. But what should you look for in a problem management solution? The truth is that every

organization is different and so the exact requirements vary somewhat from one organization to another. There are, however, key capabilities that you should look for when you're selecting a solution for your environment.

Getting Started

A comprehensive problem management solution should address all three major aspects of the problem management process — detection, isolation, and resolution — and offer key capabilities that help drive efficiency and effectiveness for dealing with problems in your IT infrastructure. Look for the following capabilities:

1. **Availability, performance, and throughput monitoring.** A thorough monitoring strategy encompasses the application infrastructure and the end-to-end transaction execution flow. Moreover, to spot problems before they impact users, it should include monitoring of synthetic transactions (simulated users).

A comprehensive problem management solution should address all three major aspects of the problem management process — detection, isolation, and resolution.

2. **Isolation and categorization of problems.** A single transaction may trigger a sequence of complex processes involving events on dozens of servers. The root cause of a problem could be a software issue, a hardware fault, a configuration issue, or human error. An effective solution isolates and categorizes the problem quickly and helps pinpoint its location precisely.
3. **Comprehensive data capture.** To determine the root cause of a problem, you must have data that fully describes user actions, application configuration, access to external resources, application performance, and full code-level execution history. Re-creating the problem environment to get that data is time-consuming and cumbersome, so an effective solution should capture data automatically and provide an easy way to drill down for root-cause analysis.
4. **Data capture from clients and servers, both remote and local.** Problems occur everywhere: on servers and workstations; inside and outside the firewall; locally and at remote sites. So your solution must capture root-cause data from all application tiers — clients, Web servers, application servers, and so forth — as well as from all possible run-time environments, local or remote.

5. **Support for any type of application problem.** You encounter many different types of problems throughout the application lifecycle. Functional problems, such as coding errors and bugs, sneak through QA testing. Performance issues occur due to non-optimized code, insufficient hardware resources, or incorrect settings within the run-time environment. Configuration problems invariably occur when you distribute across many components, and operator errors sometimes disrupt mission-critical applications. Your solution needs to address all of these problems.
6. **Support for multiple platforms.** You may be using both J2EE and Microsoft technologies for new application development capabilities. And, most likely, you still have a significant investment in existing legacy applications. A comprehensive solution should support them all.
7. **Role-based views.** According to industry experts, when software fails, nine people on average "touch" the problem before it is resolved. Each one of them looks at different data and different aspects of the problem. Application developers need visibility into code execution; application support staff look at end-user configuration settings; and performance engineers analyze system and application performance. Role-based views ensure that these people have the information they need without being overwhelmed by too much data.

Your solution must capture root-cause data from all application tiers — clients, Web servers, application servers, and so forth — as well as from all possible run-time environments, local or remote.

8. **Integration with existing tools.** You already have systems and processes for production problem resolution, including a variety of homegrown logging, defect tracking, service management, and help desk processes. The ideal solution integrates into these systems and processes. These integrations must leverage existing workflows to communicate root-cause data between different teams engaged in the problem-resolution process. Additionally, the solution must seamlessly integrate with homegrown logging mechanisms to ensure it is fully utilized by application developers and support engineers who are accustomed to using internal logs as the primary means of problem diagnostics.
9. **Minimal and dynamically controllable overhead.** To detect application problems quickly and proactively, you need a 24x7 transaction monitoring solution that adds only minimal overhead to your production environment. The solution must capture substantial volumes

of data without disrupting or degrading the production environment. It must allow you to balance the level of data capture against performance overhead, without restarting the application, so that business operations are not disrupted by problem capture activities.

10. **Quick and non-disruptive processes for reactive problem isolation and resolution.** Although monitoring solutions run 24x7 to detect problems, actual problem resolution is often a reactive process. So you need the ability to deploy capture agents on-demand to local or remote environments without disrupting the ongoing operation of the application. These non-intrusive agents should be able to record problem data while the application runs undisturbed. You should be able to accomplish this without any changes to your source code, executables, or run-time environment.

The solution must capture substantial volumes of data without disrupting or degrading the production environment.

Business Benefits

A comprehensive solution for application problem management lets all IT staff, from operations to development, simultaneously understand the true end-user experience; see the components involved in end-to-end transaction service delivery; and rapidly identify the root cause of a problem so they can find and fix problems that affect critical business applications. The payback is substantial. Such a solution enables your IT staff to pinpoint the root cause of production application problems up to 80 percent faster than with manual processes. It also eliminates time-consuming, disruptive processes for gathering information from end users. With an effective solution in place, you can perform triage more rapidly to avoid unnecessary escalations to the development team, and you eliminate the need to reproduce the environment or replicate the problem before resolving it.

These are just a few of the advantages. Given the critical nature of today's business applications, now is the time to develop a comprehensive strategy and deploy the solutions and processes you need for swift isolation and resolution of application problems. Once you do, you'll enjoy higher performance and availability and reduced risks to the business.

For more information, visit www.bmc.com.

5 Benefits of Implementing a Problem Management Solution

1. Understand the true end-user experience and see the components involved in end-to-end transaction service delivery.
2. Pinpoint the root cause of production application problems up to 80 percent faster than with manual processes.
3. Eliminate time-consuming, disruptive processes for gathering information from end users.
4. Perform triage more rapidly to avoid unnecessary escalations to the development team.
5. Eliminate the need to reproduce the environment or replicate the problem before resolving it.

About the Author

Herb VanHook *is vice president of Corporate Strategy at BMC and has held several key positions at META Group (most recently serving as interim president and chief operating officer). VanHook has more than 30 years of experience in information technology, including senior positions at IBM, Computer Associates, and Legent Corporation.*

Deliver More in Your IT Portfolio: Enhance Your Development Processes and Your Organization

By Paul Farr
Senior Director, Solutions Marketing, BMC Software

Maintaining a competitive edge is a constant pressure in business today. It's no surprise that the current goal of most CIOs is to deliver systems that not only keep the business running well, but that drive business growth. Finding and allocating costs to do so, however, can become the real challenge. After funding ongoing baseline activities, most IT organizations have less than 25 percent of their budget remaining to invest in new, growth-building initiatives. They grapple with funding new projects that the business wants and requires, without the freedom to significantly increase staff and expense levels.

Fortunately, there are ways to help free up resources to support new business initiatives — *without adding headcount or increasing expenses.* Consider, for example, that many

application development groups expend 40 to 60 percent of their resources maintaining older, existing applications, instead of investing in new application development that might better serve the business. If they could support and maintain existing applications with just 20 to 30 percent of their development resources, it would leave more resources available for application development. But how do you cut current expenditures by half? By optimizing the otherwise manual and error-prone repetitive processes.

By automating application problem resolution, forward-looking managers can reclaim as much as 30 percent of their testing and development resources.

Such an approach can help CIOs reduce the resources required to perform what are considered important but low-value activities (like software maintenance) and redirect these resources toward high-value, high-visibility projects. Development organizations can then accelerate the rate at which they deliver new functionality, while still effectively maintaining and supporting the applications currently in production.

This proactive approach to optimizing development processes can make a difference in the overall effectiveness of every IT organization. By automating *application problem resolution* (a key activity that consumes new development cycles and dominates the software maintenance phase of the application lifecycle), forward-looking managers can reclaim as much as 30 percent of their testing and development resources. Executives can leverage this value in the way that best supports their organizational goals. Examples include goals for accelerated development cycles; enriched feature content within version releases; higher-quality releases through better testing; reduced project risk; redeploying resources to other parts of the business; or any combination thereof.

Hidden Costs in Problem Resolution

Problem resolution is a fundamental development activity that increases in cost and complexity as an application moves through its lifecycle. From a budgeting perspective, many organizations allocate a 1:1 or 1.5:1 ratio between developers and testers for new development projects. This ensures that applications are adequately tested before release. The ratio of developers to QA staff alone implies that testing and problem resolution consumes between one-third to one-half of all new development activity.

Great strides have been made in automating the test execution and defect tracking processes to ensure adequate testing coverage — but to date, there has been little (or no) automation of the problem-resolution process that consumes developer and tester productivity once a problem is encountered.

Additionally, development organizations dedicate an entire team to maintain existing, mature production applications. The main activities of such teams are maintaining and updating the software and resolving problems reported by end users. Yet problem resolution is a manual, iterative, and error-prone activity. An industry study also showed as much as 80 percent of the time spent solving problems is in determining the root cause of the problem. By effectively automating problem-resolution processes, and having developers use technology that eliminates the guesswork from problem resolution, development organizations can save time, money, and other resources that would otherwise be allocated to problem solving. And, they get the added benefit of being able to release higher-quality applications to their (internal) customers sooner — without incurring higher costs.

A comprehensive problem-resolution strategy helps ensure that transactions (whether across applications or within a single application) meet the functional and performance expectations of the business *before* applications move from the development process into production. It also plays an important role during the maintenance (operations) phase of the application lifecycle, effectively coordinating processes for incident and problem management between the service desk, operations staff, and the application development team, so that development organizations gain flexibility in resource deployment and can spend more time focusing on activities that meet business requirements.

Automate the Problem-resolution Process During QA

One methodology involves automating the problem-resolution process during the quality assurance phase of the application lifecycle. The entire process can be automated, for example, by using software to monitor application execution and capture a synchronized, real-time log of user actions, system events, performance metrics, configuration data, and code execution flow. This strategy works similarly to the way a "black box" flight recorder on an aircraft logs real-time information of a given flight.

The Little Black Box

The black-box log can be replayed and analyzed by the developer to quickly pinpoint the root cause of varied application problems, whether related to performance, configuration issues, user mistakes, or code errors — without ever having to re-create the problem's environment and reproduce the problem's symptoms. Capturing actual problem history in a centralized repository provides the basis for impromptu team collaboration and communication. By allowing each member of the development team to quickly analyze problem information using role-based views, rather than re-creating the problem, an effective solution can eliminate as much as 70 percent of the cycle time traditionally consumed by root-cause analysis.

A national cosmetics company needed to support the launch and operation of a complex and massive supply-chain system that was replacing a mainframe-based legacy system. Special emphasis was on streamlining the critical "go live" phase of the project. The company's new supply-chain management system involved four different commercial application packages and more than 250 custom interfaces running on 100 servers in six different locations, processing an average of 578,000 transactions per month. These transactions involved virtually every corporate function, from inbound raw materials to outbound product shipments. The entire operation was subject to FDA oversight, necessitating high levels of end-to-end control and documentation.

> **A comprehensive problem-resolution strategy helps ensure that transactions (whether across applications or within a single application) meet the functional and performance expectations of the business before applications move from the development process into production.**

This cosmetics company used a black-box technology approach to eliminate its cumbersome, multitool process of tracing and replicating problems that involved myriad software and hardware elements. The technology helped to consolidate all application chain data — from Level 7 down to Level 1 — into a single time-synchronized view. Because the technology revealed root causes in *minutes*, versus the previous standard of *hours*, problem-resolution cycle times for the application were reduced 60 percent. When problems arose, the problem log provided the salient details.

In this instance, the black-box strategy helped organize data into a coherent, time-synchronized view that could isolate and correlate events at various system levels corresponding to each user's need to know, expertise, and authorization. It provided a means to filter and analyze data in a way that helped reveal the root cause of each problem. This virtually eliminated the previous standard, a time-consuming procedure that replicated problems offline so they could be studied, diagnosed, and resolved (a procedure guided largely by guesswork, at the time). For this company, black-box technology accelerated problem resolution and reduced the time for getting a major new supply-chain application online.

Synchronize and Consolidate During the Maintenance Phase

One of the largest IT and business process service companies in North America needed to reduce the time it took to activate customer cellular phones. The company turned to black-box problem-resolution software to quickly reveal root causes of problems in their applications that were otherwise understood only symptomatically (i.e., the application was performing very slowly). The development team could replicate the symptoms of poor performance many ways in the lab, but could not pinpoint the exact root cause of why the application performed poorly in the production environment. Black-box technology enabled the company to pinpoint the root cause of trouble all the way down to the code level, helping to quickly resolve situations and maintain service level agreements. As a result, the company can now analyze production problems that never would have been found using a traditional QA process in performance testing.

Using this approach, all relevant information from several levels was consolidated onto a single screen. This enabled IT staff to detect a backlog of pending requests and understand the need to increase the number of threads used. Armed with the insight provided by this technology, the group was quickly able to increase end-to-end throughput by 50 percent, while cutting in half the average cell phone activation times to customers.

Successful Operations

Using application problem-resolution strategies based on black-box technology, CIOs can adjust their IT investment model to deliver more value to the business — achieving more results with the same resources, expediting application deployment, and offering greater application functionality. By automating the problem-resolution process, developers can put more of their efforts into projects that drive business growth, and spend less time maintaining existing applications or hastily reacting to problems with newly released applications.

Ultimately, this approach allows CIOs to deliver on their IT portfolio more effectively, through timely deployment of applications, at a lower cost, and at the expected levels of functionality.

For more information about BMC solutions for application problem resolution, visit www.bmc.com/transactionmanagement.

About the Author

Paul Farr, *senior director of Solutions Marketing for BMC, has more than 25 years of experience as an executive in the performance management and troubleshooting technology markets. From 2001 to 2005, Farr headed Jupiter Management, LLC, where he implemented turnaround and exit strategies for venture-funded technology companies. Previously, Farr was president of the Sniffer Technology business unit of Network Associates and served as vice president of product management at Network Associates. He also was senior vice president and general manager of AIM Technology, which was acquired by Network General.*

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